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Glossary

This manual was revised August 2004.

U.S. Grains – Commodity Descriptions

Corn

Corn is the world's renewable golden resource. Each year U.S. farmers devote 1 in 4 arable hectares or acres to its production. No other country can match U.S. productivity in growing corn or its efficiency in harvesting corn's energy potential. The U.S. livestock industry is the world's most efficient due to the availability of inexpensive, energy-efficient corn. The U.S. grain handling and export industry has evolved into the envy of the world on the strength of ever increasing production.

The same crop has, through its abundance, challenged several generations of entrepreneurs to derive unique products from its component parts, including everything from sweeteners, ethanol and road salt, to packaging products, fabric and golf tees.

Corn has generated all this dynamic economic activity because it has remained abundant and inexpensive, despite the unpredictable ravages of nature through flood, drought and freeze. In real terms, corn prices today are just 35 percent of what they were 20 years ago. Though demand from innovative industrial processes just coming on line is expected to accelerate in the coming years, vast productive capacity remains untapped in the United States. Improved hybrid strains, along with more efficient and ecologically sound farm practices will enable the U.S. producer to meet expanding demand in the 21st century. Most importantly for the consumer, demand is expected to be met in the same environment of stable or declining real prices which have occurred during the last two decades of this century.

CORN USAGE

The principle use of corn, in both the United States and the rest of the world, is in livestock feed. In the United States, corn consumption as animal feed has averaged over 120 million metric tons (MMT) over the last five years. Corn can supply all the energy and a large percentage of the protein in an animal's diet. Its low cost,

high palatability, availability and consistent nutrient content make it the feed ingredient of choice by livestock producers of every kind. In the United States, where wheat, oats, barley and sorghum compete as feed grains, corn represents up to 86 percent of the grain used as feed. A single metric ton of economical, efficient corn can be converted into .27 MT of beef; .48 MT of pork; or .66 MT of poultry.

Corn is also processed into industrial goods by wet or dry milling. Each corn kernel is separated into three component parts: the germ; starch; and the hull. From the germ comes corn oil. Starch is the feedstock for further processing into ethanol (ethyl alcohol), fructose and industrial starch. The hull, or bran, is combined with residue from these extraction processes to become corn gluten feed or corn gluten meal, which are both prized additions to livestock feed.

Corn gluten meal, the combination of bran fibers and the corn oil cake left from the extraction of corn oil, has protein content in excess of 60 percent and is a low-cost alternative to soybean meal or other expensive protein sources. Poultry feeders particularly value corn gluten meal because of the presence of xanthophyll, a pro-vitamin which determines corn's pigmentation and enriches the yellow color in a chicken's skin and eggs. Corn gluten feed is a result of gluten, removed from the heavier starch, being combined with bran from the hull to make a feed ingredient that dairy cattle and sheep find particularly palatable.

For more than 100 years, millers have been devising new products from the chemical manipulation of the refined starch feedstock. Today, products made from corn starch, or its manufacture, include high fructose corn syrup, ethanol, antibiotics, stiffeners for paper, textiles and food, paint, make-up, coatings, films and adhesives. As dextrose, corn becomes the principal ingredient of many processed foods, such as peanut butter, hot dogs and baby food. In the textile industry it finds use, aside from starch, in absorbents, dyes and sizing. The packing industry uses biodegradable corn "peanuts," while ecologically friendly garbage bags are making their way into U.S. households.

Corn has already made significant inroads into every facet of U.S. leisure and business life. Extensive, ongoing research at the governmental, institutional and corporate levels ensures that the limitless resources of corn will continue to astound us in the future. This marvelous plant, which has been domesticated for 7,000 years, has only begun to demonstrate the broad range of applications it has in our daily lives.

THE CORN PRODUCTION CYCLE: SEASONAL FACTORS

The versatile corn plant can thrive in climates as diverse as the arid desert plains of the southwestern United States, to the high Andean mountain plains of Ecuador and Peru. But it is in the temperate plains of the U. S. Corn Belt, which include Nebraska, Iowa, Illinois, Minnesota, Indiana and Ohio, where the plant dazzles the agricultural world with its productivity.

Higher yields are strongly correlated with a longer growing season, and hybrids with 110 days or more until maturity are typically planted in the United States. Surprisingly, the topsoil and subsoil moisture content at planting time supplies from 50 to 70 percent of the plant's moisture needs. Consequently, moisture conditions heading into the spring, when corn is planted in the United States, are very important to potential yield. Crop forecasters base their crop predictions on a formula derived from soil moisture levels before the farmers set out to seed their fields.

Germination and seedling establishment follow quickly upon planting. If the soil is too dry or cold, the seed may not germinate or the seedling may not take root. No amount of rain in the later stages of the growing season will counteract an early loss of a plant population during the germination period.

It is extremely unusual for high levels of precipitation or soil moisture to adversely affect corn production. Wet soils can delay planting and slow maturity. This will expose the plant to additional risk during the pollination period. But standing water or the complete saturation of the soil provides benefits that generally outweigh any risk.

Once established, the corn plant is very strong. Between the seedling and tassel stages, there is very little harm adverse weather or insects can do to the corn plant from which it cannot recover. However, it is in the four weeks surrounding pollination that corn is most vulnerable. Generally, this most critical period of the growing season in the Corn Belt encompasses the entire month of July. After this period, the Corn Belt is safe from damage to production yields. However, during this period, extreme temperatures or drought will prevent pollen from fertilizing individual silks, resulting in fewer kernels on each ear. Hot temperatures during this period inflict much greater harm on the crop than heat in August and September.

Early frosts have a marginal effect on yields, cutting short the kernel filling and drying stages. Extreme cold temperatures at this late stage in the crop's development are more likely to effect quality than final yields.

Disease and insects are no longer serious threats to U.S. yield potential. The technological advances made by U.S. farm input suppliers in fertilizers, herbicides, insecticides and pesticides have dramatically reduced their impact on corn production.

For further information contact:

National Corn Growers Association
632 Cegi Drive
Chesterfield, MO 63005 U.S.A.
Phone: (636) 733-9004
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Website: www.ncga.com

U.S. sorghum production is concentrated in the Central and Southern Plains. The states of Texas, Kansas, Nebraska and Missouri produce approximately 80 percent of the U.S. crop.

Sorghum

Unlike corn, the hybridization of sorghum got off to a late start. Only in the 1950s, when a sorghum hybrid of uniform, short stem height became commercially available, did sorghum production really excel. At the beginning of that decade, planted acreage in the United States was only 3.3 million hectares. Since then it has risen as high as 10.9 million hectares.

Like corn, sorghum can be grown under a wide range of soil and climatic conditions. However, unlike corn, yield variance under those different conditions is not so great. Across the corn producing states in the United States, yield can vary as much as .52 MT plus/minus per hectare. With sorghum, yield variance is much less, only .20 MT plus/minus per hectare. Sorghum promises a steady, less spectacular return than corn for feed grains producers. Consequently, it is grown primarily in arid areas of the plains where corn production must be irrigated to be profitable. Sorghum is justly renowned for its ability to survive on limited moisture and to produce during periods of extended drought.

SORGHUM USAGE

Livestock feeding accounts for 97 percent or more of domestic sorghum usage in a given year. Different types of animals use sorghum more efficiently than others. Tannin, an acidic complex found in sorghum, can affect both the palatability and nutritional value. Historically, sorghum was prized for its tannin content because high-tannin sorghum is not palatable to wild birds. Such sorghum is still grown in areas of the world where birds are a threat to the crop.

In the United States, however, sorghum has long been bred to reduce the tannin content, improving nutritional value by as much as 30 percent over alternative origins.

Sorghum has a very hard kernel. This makes it resistant to disease and damage but also requires further processing to enhance its feeding efficiency. Sorghum is ground, cracked, steam flaked, roasted, micronized or reconstituted. Such processing will enhance the nutritional value of sorghum by 12 to 14 percent.

In the United States, sorghum is a principle feed ingredient for both cattle and poultry. The swine industry is not as significant a consumer of sorghum because production is geographically concentrated in the Corn Belt. Sorghum is processed by wet millers and dry millers into ethanol. Wet milling plants are concentrated in the heart of the Corn Belt where transportation spreads discourage the use of sorghum.

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Email: tsnyder@sorghumgrowers.com
Website: www.sorghumgrowers.com

Barley

After corn and sorghum, barley is the third largest feed grain crop produced in the United States. Production in the United States is concentrated in the Northern Plains and the Pacific Northwest. Barley is produced in areas of the United States where the growing season is relatively short and climatic conditions are cool and dry.

Both two-row and six-row barley is produced in the United States. Roughly 65 percent of the U.S. acreage is planted to six-row barley in the Northern Plains and Pacific Coast states. The balance, 35 percent, is planted to two-row barley in the Rocky Mountain states. Universities in the Northern Plains states maintain aggressive breeding programs that continue to produce new varieties that improve the agronomic, feed and malting qualities of U.S. barley.

U.S. barley producers are committed to improving the quality of the inputs that go into barley production in the United States. Most producers plant several of the 100-plus commercially available barley types. Each practices strict varietal purity, preserving the identity of each different variety during seeding, harvest, storage and handling. This combination of innovation and efficiency enables the U.S. barley industry to satisfy the needs of any barley consumer, whether they are a livestock feeder, maltster or food retailer.

BARLEY USAGE

Though most barley in the United States is grown to be malt barley because of the price premium it commands, the bulk of U.S. barley is consumed as livestock feed. With more than 70 percent of the barley planted to acceptable malting varieties in the United States, this means the feed compounder is getting a very high quality product.

The production of malt beverages in the United States has stabilized over the past decade. The brewing industry uses a mixture of two-row and six-row barley in the production of malt beverages. Two-row barley should be a minimum of 85 percent plump, a maximum of 3 percent thin and 11.5 to 13.5 percent protein. U.S. maltsters prefer six-row barley with a minimum of 70 percent plump, a maximum of 3 percent thin and protein levels of 12 to 14 percent. Germination is very important and that of U.S. barley is consistently high. The efficient U.S. handling system ensures that skinned and broken kernels, which reduce germination counts and malt yield, are kept low.

Though two-row varieties are higher in test weight and kernel production plumpness, six-row barley has superior enzyme systems which are crucial to the value of malt in beverage production. Brewers evaluate malt on the basis of total protein, soluble protein extract, fine/coarse difference, diastatic power and alpha amylase. The very high diastatic power and alpha amylase levels in six-row barley make U.S. malt very efficient in the brew house.

Barley is a popular feed grain throughout those parts of the United States where it is grown, or has a clear transportation advantage, such as California. Though barley is not as efficient an energy converter as corn, it does have a higher protein content which reduces the need for protein supplements in a compound feed. Consequently, barley competes very effectively with both corn and sorghum as a feed grain in the United States.

Barley is popular as a staple food. It is used in soups, as an extender for vegetable proteins and is occasionally milled into flour.

For further information contact:

National Barley Growers Association
2601 Wheat Drive
Red Lake Falls, MN 56750 U.S.A.
Phone: (218) 253-4311
Fax: (218) 253-4320
Email: mzutz@gvtel.com

Industrial Uses for Grains

Current Industrial Uses

Man has been harnessing the corn kernel for the value of its parts for several centuries. It has long been a base for the fermentation of alcohol. There is evidence Native Americans used corn to brew beer before Europeans set foot in the Americas.

And, like today, government played a hand in the first attempts to process corn into something other than hominy or animal feed. The Molasses Act, forced on the American Colonies by the British Parliament in 1733, first encouraged attempts to turn corn into sugar. Later in the 18th century, one of the first national attempts at taxation in the United States was on corn whiskey and led to the young country's first domestic crisis in the Whiskey Rebellion of 1792. Western farmers distilled their corn into whiskey because it was easier to transport. Efforts to process bulk corn into some product more portable, at a time transportation was primitive and expensive, intensified with the whiskey tax.

By the mid-19th century, corn had replaced wheat and potatoes as the principle feedstock for starch production. In the United States, cornstarch was first commercially converted into sugar in 1865 and, long before the automobile was a common form of transportation, corn had been processed into ethyl alcohol, or ethanol. Many of the earliest engine prototypes were designed to run on ethanol. It was the discovery and easy recovery of cheap oil that eliminated ethanol as a competitive fuel 100 years ago.

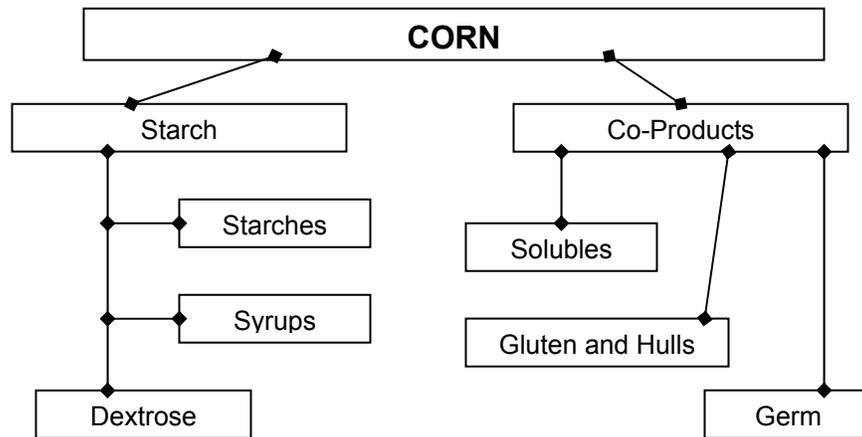
Sweetener and food additive demands were the primary driving force of industrial corn utilization and product innovation until the latter half of the 20th century. Out of 67 kilograms of sweeteners consumed by Americans annually in a variety of products, over one-third of them come from corn or another feed grain.

The versatility, availability and cost of the product pushed chemists to devise uses for corn - and the starch derived from it - in a spectrum of merchandise that proved to be extensive. Even before energy conservation and environmental concerns spurred industrial production into areas of fuel and plastic substitutes, corn use had spread

throughout every aspect of industrial production. Not surprisingly, those who process corn and refine it into these products today have become very efficient at it.

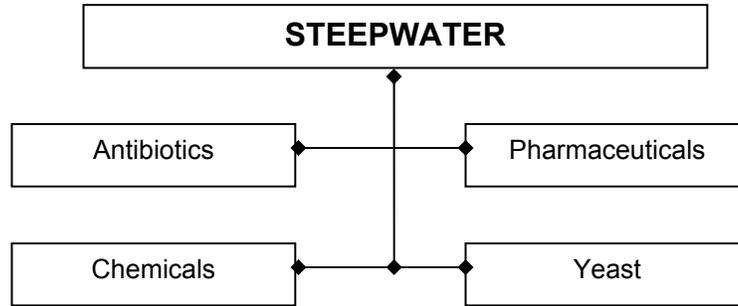
Most people working in the U.S. corn refining business have been at it for some time and have become truly adept at squeezing every drop of value from each kernel's molecular structure.

*The Wet
Milling
Process*



Upon arriving at a processing plant, each load of corn passes through a cleaner that removes foreign material and other impurities. Then the corn is soaked for 36 to 48 hours in hot water and sulfur dioxide. This process softens the protein (gluten) within the starch matrix while also toughening the germ.

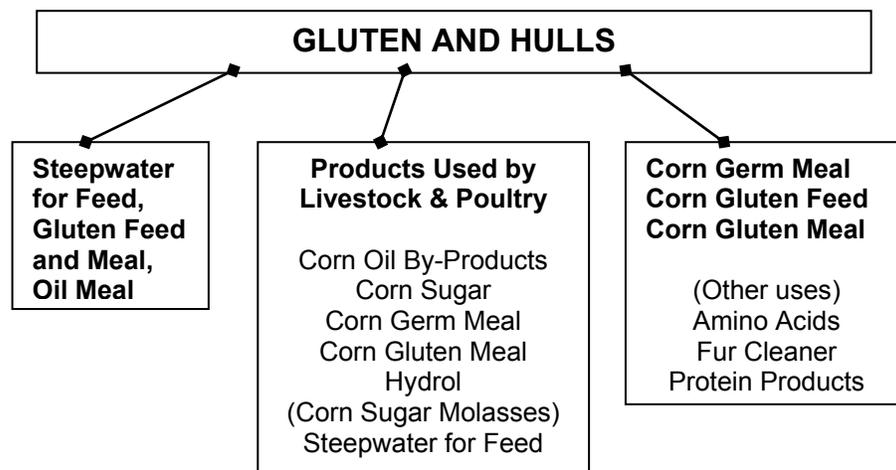
The softened corn kernel moves on to the degerminating mills and the resultant water-based mixture is called steepwater. Steepwater is highly nutritious and can be further processed for various uses. This additional processing consists of dismembering the weakened kernel and separating the bran. Then, the aqueous mixture of parts moves on to floatation tanks where a centrifugal hydrocyclone separates the heavier parts from the lighter germ.



The lighter germ is then crushed for its oil content. After the oil is removed, the remaining material is called, among other names, “corn oil cake,” and is ground into meal.

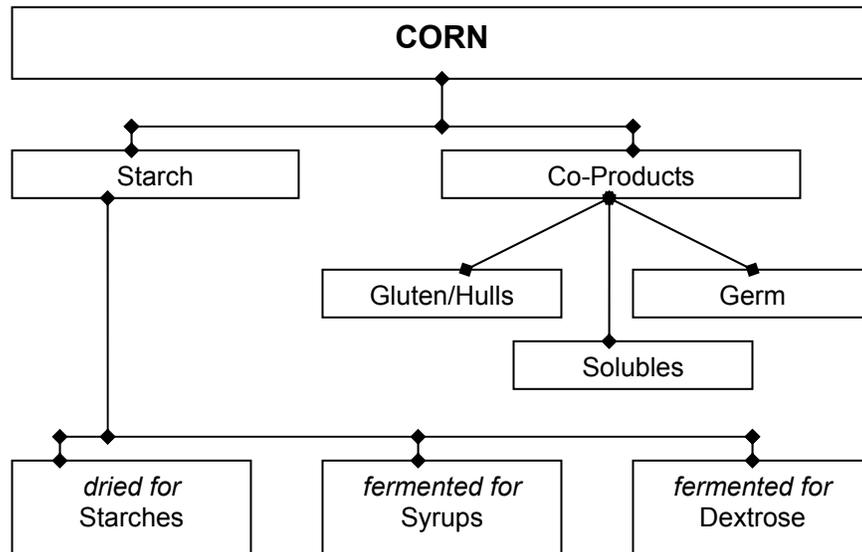
What remains after the germ is removed is first filtered and then returned to a high-speed centrifuge. In the centrifuge, gluten is separated from the mixture and removed. The gluten, as much as 70 percent protein, is mixed with the bran and/or the germ residue to become corn gluten meal or corn gluten feed.

Finally, with the gluten removed, the corn miller is left with the industrial heart of the corn kernel – the starch - or any feed grain that is refined through this process.



Starch is the feedstock that yields nearly all current industrial feed grains products. From starch comes the vast array of industrial products created over the years by public and private sector research chemists.

*The
Wonder of
Starch*



The most promising areas of new research and opportunity for industrial uses lie in expanding the use of feed grains as a substitute for petroleum. There is no molecular hydrocarbon derived from petroleum that cannot be replicated from the starch feedstock.

*New
Avenues of
Research
for
Industrial
Uses*

The best hope for feed grains in quickly supplanting petroleum is plastics:

- LDPE:** Low density polyethylene
- HDPE:** High density polyethylene
- PVC:** Polyvinyl chloride
- PP:** Polypropylene
- PS:** Polystyrene

Biopolymers, such as polylactic acid (PLA), have had the most success competing in the LDPE market. Inroads into this market began with the development of a family of biodegradable polymers. Their acceptance has been spurred by growing environmental concerns, though the pace of that acceptance has been uneven and often difficult.

As environmental issues push biopolymers into commercial channels, continued research and development will help bring the cost of production down and broaden the demand beyond environmental niches.

Products made of biopolymers were already common in the field of medical applications without adding their unique environmental benefits. The niche established in the field of food and product packaging will grow as new eco-friendly legislation spurs compliance by manufacturers across many industries. These applications will be concentrated where recycling is either impossible or made impractical by the circumstances of a product's use.

*New
Product
Examples*

ENCAPSULATION

Encapsulating products in a biopolymer is a fast growing field of research and application. The process encloses a material - anything from vitamins to fertilizers to toxic poisons - in a feed grain polymer derived from starch that can be designed to remain intact, protecting the encapsulated material, in most environments, and only breaking down and releasing the material when it is demanded.

Encapsulation protects products from contact before use that might lead to deterioration and significant value loss. Biopolymers can also be constructed to allow controlled, gradual release of the encapsulated material, saving repeated applications, time and labor. And, in the case of toxic material, it protects those who must work with it from potential injury or death, thereby reducing liability and creating a safer workplace.

SOLVENTS

The most immediate example of a solvent derived from ethanol is windshield washer solvent. Typically, this product has been made from a methanol feedstock, itself derived from natural gas. Yet this product, which is found in many homes, is extremely toxic if swallowed.

Solvent produced from ethanol is as efficient, safe and price competitive when the social costs of the methanol product are

considered. Although traditional methanol-based washer solvent still holds the bulk of market share, these qualities should soon make the ethanol-based solvent the product of choice in the United States.

CALCIUM MAGNESIUM ACETATE

Road salt is needed to keep roads free of ice and snow build-up during the winter in many areas of the world, but the resulting corrosion is wreaking havoc with bridge and road infrastructure. Estimates of this damage in the United States run as high as \$5 billion. Costs from the contamination of drinking water and roadside vegetation are not estimated but they are significant.

Calcium magnesium acetate, or CMA, can also be produced from either a natural gas or feed grains feedstock. CMA is just as effective in ridding roads of dangerous ice and snow. However, it is currently more expensive than road salt before factoring in the societal costs to infrastructure, water quality and environment. Its use is just beginning to catch on with U.S. municipalities faced with the burden of rebuilding their infrastructure.

ABSORBANTS

This is one area where commercial applications are many and already successful. Biopolymers derived from cornstarch were discovered to absorb as much as 1,000 times their own weight more than a decade ago. They quickly found use in disposable diapers, filters and absorbent pads for medical treatments.

Researchers have continued to find new uses for these biopolymers in the area of waste cleanup technology.

CHEMICALS

Considerable time and expense has been put toward deriving high-value industrial chemicals from a starch feedstock. Although the process is still not competitive with petroleum refining, there are firms in the United States making industrial chemicals such as propylene glycol, glycerin and ethylene glycol from starch refined from corn. These chemicals are in turn the feedstock for a whole range of everyday products such as cosmetics, synthetic fats, polyester resins, polymers and antifreeze.

The petroleum industry has been around for nearly a century and has been able to compete with its hundreds of billions of dollars worth of refining infrastructure. However, work on making the process cleaner and cheaper continues to narrow the gap between petroleum chemicals and the corn-based equivalent.

Licensing

How can importers tap into these potential markets at home? While most of the basic refining processes have been part of general industry practice for generations, there are now specific processes that are protected under domestic and international patents.

These include certain fermentation processes to produce ethanol and many of the chemical processes that create individual biopolymers that form the basis for these new products.

It is beyond the scope of this manual to list or describe all those processes that are protected by intellectual property laws in the United States or the international community. There are many resources provided by non-profit industry groups, U.S. government agencies and international organizations that can help importers both keep track of the exciting developments in the field of industrial uses for feed grains and lend direction on how to harness the power of feed grains.

RESOURCES

U.S. Grains Council
1400 K Street, NW
Suite 1200
Washington, DC 20005 U.S.A.
Phone: (202) 789-0789
Fax: (202) 898-0522
Email: grains@grains.org
Website: www.grains.org

The Council was founded in 1960 to develop and promote exports of U.S. feed grains and their co-products. It is one of the few organizations whose membership is truly representative of both producers and agribusiness interests. They have successfully coordinated and unified the efforts of both groups into a policy

promoting the global expansion for the utilization of feed grains and their co-products. This manual is part of that effort.

The Council can be called on by any importer or potential importer for assistance in either developing the technology to process feed grains for industrial uses or in providing information on those products themselves. The Council will direct inquiries to one of their many internal experts on trade and utilization or to one of the 100-plus firms and organizations comprising its membership. The Council also maintains offices in 10 different countries plus consultants in many more to help importers with their feed grains needs.

National Corn Growers Association

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Chesterfield, MO 63005 U.S.A.

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Website: www.ncga.com

Founded in 1957, the National Corn Growers Association (NCGA) has nearly 29,000 corn producer members in 47 states. The Association's mission is to enhance corn profitability and utilization while improving the quality of life in a changing world. Among the Association's many programs to further this mission is a strong commitment to developing new markets for corn.

In this role, the NCGA has funded many innovative research projects probing the technological frontier for new industrial feed grains uses. They have, for instance, helped focus the search for new products on ethanol and biodegradable plastics. They continue supporting efforts to make these processes more efficient and competitive with petroleum feedstock and are promoting the development of starch-based substitutes for road salt and window washer fluid.

The Association has a unique network of relationships focusing on the development of new industrial uses, as well as a number of experienced professionals working on their market potential. These professionals can direct inquiries to researchers supported by or familiar with the Association efforts in this area. They can also help direct importers with specific inquiries to refiners or manufacturers in the United States who might hold patents that could be licensed for overseas use by an interested importer.

National Grain Sorghum Producers
4201 N. Interstate 27
Lubbock, TX 79403 U.S.A.
Phone: (806) 749-3478
Fax: (806) 749-9002
Email: tsnyder@sorghumgrowers.com
Website: www.sorghumgrowers.com

This Association represents sorghum grain producers across the United States. They promote alternative uses for sorghum, which include limited use as a feedstock for ethanol production. They do significant work on production efficiencies, including testing on feed efficiencies related to the presence or absence of tannin.

The Association is a resource for potential importers who wish to use grain sorghum as an industrial feedstock and for help in inquiries dealing with the production of ethanol from sorghum.

National Barley Growers Association
2601 Wheat Drive
Red Lake Falls, MN 56750 U.S.A.
Phone: (218) 253-4311
Fax: (218) 253-4320
Email: mzutz@gvtel.com

This Association represents barley grain producers across the United States. They promote alternative uses for barley and do significant work on production efficiencies.

The Association is a resource for potential importers who wish to use grain barley as an industrial feedstock.

Corn Refiners Association, Inc.
1701 Pennsylvania Avenue, NW
Suite 950
Washington, DC 20006 U.S.A.
Phone: (202) 331-1634
Fax: (202) 331-2054
Email: aerickson@corn.org
Website: www.corn.org

The Corn Refiners Association (CRA) represents the wet milling industry in the United States.

The CRA is unabashed in its support of innovative feed grains

utilization, particularly corn. It is the principal source of information on new products from wet milling feedstock and their current use by different industries.

Importers needing statistical information on the U.S. corn wet milling industry should think of the CRA as their first resource. The CRA can also help direct specific inquiries to their refiner members.

North American Millers Association

600 Maryland Avenue, SW

Suite 305 West

Washington, DC 20024 U.S.A.

Phone: (202) 484-2200

Fax: (202) 488-7416

Email: generalinfo@namamillers.org

Website: www.namamillers.org

This organization does for the dry corn milling industry what the CRA does for the wet milling industry.

New Uses Council

Business Office

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Fax: (401) 423-0862

Email: info@newuses.com

The New Uses Council was established in 1990 to promote alternative uses for U.S. agricultural products. Its mission is “to develop and promote the use of renewable agricultural and forestry resources in the production of new, nonfood industrial and consumer products.” In pursuit of this mission, the New Uses Council has the active support of many diverse producer and industry groups who share the same charge for its specific sponsors: the promotion of new and innovative uses for the agricultural output of the United States.

The New Uses Council has, as its principal resource, the network of its many members. The firms and organizations that comprise the group cover a broad spectrum of industry and producer interests. Consequently, the Council offers a picture of this exciting field that is as complex as it is complete.

Importers can use the New Uses Council as a resource to complement the U.S. Grains Council and producer associations in gaining insight into the latest developments on industrial uses. The New Uses Council would also serve as a reference for identifying potential commercial sources for licenses on individual products and processes.

Renewable Fuels Association
1 Massachusetts Avenue, NW
Suite 820
Washington, DC 20001 U.S.A.
Phone: (202) 289-3835
Fax: (202) 289-7519
Email: info@ethanolrfa.org
Website: www.ethanolrfa.org

This Association was organized during the 1970s. Their mission is to promote the use of renewable fuels. In practice, this has meant a strong voice for ethanol.

U.S. GOVERNMENT

U. S. Department of Agriculture
1400 Independence Ave., SW
Washington, DC 20250 U.S.A.
Phone: (202) 720-3631
Website: www.usda.gov

Within this agency, the two main offices to contact for further information are the Office of New Uses and Energy and the Agriculture Research Service.

National Center of Agricultural Utilization Research, ARS
1815 North University Street
Peoria, IL 61604 U.S.A.
Phone: (309) 685-4011
Fax: (309) 681-6686

The Agricultural Research Service is responsible for spending much of the money the U.S. government puts toward agricultural research. A modest portion of this goes specifically toward new product research; a small share of that portion toward developing new industrial products.

The ARS operates numerous laboratories across the country. The Service is deeply involved in research on a broad spectrum of agricultural questions, including all those raised in the debate over new industrial uses for feed grains. For example, this is the government service responsible for most of the latest developments into starch research. They have made exciting strides in areas of biopolymers and encapsulation. The “super absorbents” that have had such commercial success are a product of these government laboratories.

They are an excellent source for new product avenues, quick and eager to share their ideas. Importers interested in exploring industrial feed grains use should include the ARS on their fact-finding tour.

Office of Technology Transfer

NIH

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Phone: (301) 496-7057

Fax: (301) 402-0220

Email: nihott@od.nih.gov

Website: <http://ott.od.nih.gov/>

One method the U.S. government uses to share the fruits of its research labors is through the Office of Technology Transfer (OTT). Part of the National Patent Program, and a Division of the ARS of the U.S. Department of Agriculture, this office speeds products or processes developed by government scientists into commercial application.

A unique blend of taxpayer-funded support and entrepreneurial incentives, the program rewards individual scientists who work on government projects a share in any patents and licensing revenue that results from commercial application.

It was this office that licensed the super absorbent biopolymers that rank as one of the great successes of feed grains over the competitive petroleum feedstock. The U.S. government holds hundreds of other patents, many of them related to starch research from the National Center of Agricultural Utilization Research in Peoria, Ill.

These patents include new approaches to absorbents, many different encapsulation biopolymers, a variety of films (for example, shrink-wrap biodegradable mulch) and new processes to ferment ethanol from cornstarch.

The Federal Technology Act of 1986 empowered the government, in this case, ARS, to enter into contracts and agreements with both the ARS and individual scientists called Cooperative Research and Development Agreements, or CRADA's.

CRADA's give the cooperator who has entered into an agreement with ARS the right of first refusal to any commercial license opportunities that might arise from the agreed-to project. Under CRADA's, the cooperator may or may not provide funds depending upon the relevance of the proposal to the agency's mission. Information on CRADA's and how they function can be obtained through the OTT.

For help in identifying an opportunity to work with the ARS in CRADA's, inquiries should be directed to ARS Utilization in Peoria, Ill., or their Washington headquarters.

OTT also offers a number of services designed to showcase the government's inventory of agricultural patents. These include:

- TEKTRAN – an electronic system that gives the subscriber direct access to information on new research results and inventions that are available for commercial licensing.
- Agricultural Inventions Catalog – a comprehensive list of the patents held by government jointly with ARS research scientists. The catalog is updated periodically and can be obtained through the OTT.

In addition, detailed help in obtaining licenses for U.S. government-held patents is available through the OTT. They have published several how-to aids that walk the potential licensee through the steps needed to bring the product or process patented to the marketplace.

Alternative Agricultural Research and Commercialization Center
12th & C Streets, SW
Washington, DC 20250 U.S.A.
Phone: (202) 401-4860
Fax: (202) 401-6068

The Alternative Agricultural Research and Commercialization Center, or AARCC, was established by the U.S. Congress in the 1990 Farm Bill. The mission of AARCC is to provide an independent forum for government to aid promising commercial applications of agricultural research.

Under the AARCC charter, proposals are submitted for review and, if accepted, AARCC and the submitting cooperator share in the expense of the project. AARCC's share of the contribution is repaid when the project's commercial applications begin to produce revenue. The funds are then reinvested in another project, theoretically priming the research pump eternally.

The first time AARCC accepted applications for project funding, at least 150 projects totaling nearly \$500 million were submitted. Some of the products AARCC is currently funding that involve feed grains include:

- a value-added composting system designed to relieve demand on large-scale landfill operations; the system is based on cornstarch-based polymers and animal materials which yield a product of high nutrient value;
- new pest control products based on cornstarch-encapsulated formulations;
- reopening a mothballed ethanol plant and upgrading the refining processes; sorghum would be the principle feedstock;
- developing an ethanol-based windshield wiper fluid; and
- developing a farmer-based group that aims to accelerate the commercialization of the processes that turn cornstarch into industrial chemicals.

AARCC officials will share information on the projects they are currently funding and direct inquiries on potential licensing opportunities to the respective cooperator involved.

Cooperative State Research, Education & Extension Service
Waterfront Center
800 9th Street, SW
Washington, DC 20004 U.S.A.
Phone: (202) 720-7441
Fax: (202) 401-1782
Website: www.reeusda.gov

The Cooperative State Research Service is another USDA agency charged with the broad task of furthering agricultural growth through the avenue of new industrial uses. The Service is an information network for the many state research activities that take place outside the federal government umbrella. They also serve to coordinate

activities between the different research arms and direct federal funds to promising programs carried on at state laboratories and facilities.

They are an excellent resource for the potential feed grains user, providing a unique overview of the many state-funded programs of research that do not come under federal oversight.

**Department of Energy
Office of Alternative Energy
National Biofuels Program
1000 Independence Avenue, SW
Washington, DC 20585 U.S.A.
Phone: (202) 586-9118
Fax: (202) 586-4403**

For importers specifically concerned with ethanol and using its energy to supplant unhealthy and environmentally unsound petroleum products, the Department of Energy's Office of Alternative Energy is the first place to turn for advice on government efforts in this important area.

Under an agreement between the departments of agriculture and energy, this office spearheads the joint efforts of these federal agencies to promote biofuel use and fund projects designed to make the refining process more efficient.

The Department of Energy is also responsible for monitoring the implementation of the Clean Air Act which promises to boost ethanol consumption in the United States by up to 33 percent by the turn of the century. The Department of Energy supervises research on ethanol-burning vehicles and the relative environmental benefits of ethanol and other alternative fuels.

**Department of Defense
Pentagon
Washington, DC 20301 U.S.A.
Phone: (703) 692-7100**

The Department of Defense has a group whose aim is to support domestic sources of energy. Though this is broad enough to cover many renewable energy schemes, the agency is particularly interested in biofuels to replace the imported petroleum products the military relies exclusively on today.

**U.S. Patent and Trademark Office
General Information Services Division
Crystal Plaza 3, Room 2CO2
Washington, DC 20231 U.S.A.
Phone: (800) 786-9199
Fax: (703) 305-7786
Email: usptoinfo@uspto.gov
Website: www.uspto.gov**

**Patent Depository Library
Phone: (703) 308-3924**

Both of these agencies can be used as resources to research the patent history of agriculture inventions in the United States. They can provide detailed descriptions of the products and processes protected by U.S. and international patent law and identify the patent holder if an importer is interested in licensing that technology.

How to Procure U.S. Grains

The first step in procuring feed grains from the United States is simple and often overlooked - the importer should thoroughly understand and be willing and able to clearly express what the importer wants and needs. An importer with a clear understanding of the end use requirements of the feed grains imported can better evaluate the various quality and price options available to U.S. feed grains customers.

The importer should also possess a detailed knowledge of the various U.S. feed grains and the characteristics of each type. The first chapter of this manual dealt with and explained the different U.S. feed grains; the second with the industrial uses for products derived from them. With this information, the importer can proceed to the next step: finding a responsible supplier for the U.S. feed grains the importer chooses to buy.

This chapter will examine the procurement procedure under both the formal invitation for bid (IFB) and the more informal, and private, direct negotiation with one or more suppliers. It will also explore the use of standard contract forms as well as help to clarify the basic documents often required in the international grain trade. These tools should allow the importer to procure the best value, in a competitive price environment, for the U.S. feed grains the importer needs to purchase.

Finding a U.S. Grains (or Co- products) Supplier

There are several ways an importer can discover the names of potential U.S. feed grains exporters. When contacting a potential supplier, an importer should be prepared to provide commercial references, banking references, a description of the importer's business or international commodity trading experience, and any other necessary information that might demonstrate an ability to initiate and execute an international grain transaction. The following associations are available to assist importers by placing them in contact with interested suppliers:

THE U.S. GRAINS COUNCIL (USGC)

The USGC is a private, non-profit organization with the goal of developing and expanding export markets for U.S. produced feed grains and their co-products through an international network of 10 offices. The Council is headquartered in Washington, D.C., and maintains offices in Latin America, Europe, the Middle East, Africa and Asia. All of these offices can assist importers with the search for a U.S. supplier. For further information, contact:

U.S. Grains Council
1400 K Street, NW
Suite 1200
Washington, DC 20005 U.S.A.
Phone: (202) 789-0789
Fax: (202) 898-0522
Email: grains@grains.org
Internet: www.grains.org

THE NORTH AMERICAN EXPORT GRAIN ASSOCIATION (NAEGA)

NAEGA is a trade association whose members include many private companies and cooperatives that handle almost all U.S. feed grains exports. Maintaining an office in Washington, D.C., NAEGA can be very helpful in providing importers with the names of interested suppliers of U.S. feed grains and their co-products.

For more information, contact:

North American Export Grain Association
1250 I Street, NW
Washington, DC 20005 U.S.A.
Phone: (202) 682-4030
Fax: (202) 682-4033

U.S. AGRICULTURAL ATTACHES AND COMMERCIAL OFFICERS

The U.S. Embassy or consular office in most countries contains an agricultural attaché or commercial officer who is the overseas representative of the Foreign Agricultural Service (FAS) of the U.S. Department of Agriculture (USDA). The agricultural attaché can offer the local importer a broad range of information regarding U.S.

government-assisted export programs as well as assistance in finding a number of U.S. feed grains suppliers.

In addition to the above sources, interested importers might contact their local commercial banker or the branch office of a U.S.-based commercial bank for a list of potential suppliers.

THE INVITATION FOR BID (IFB)

After establishing contacts and assembling a list of potential U.S. feed grains suppliers, the importer must decide whether to seek offers through direct, private negotiation or through a more public and formal invitation for bids (IFB).

Purchasing U.S. Grains (or Co- products)

An IFB is a formal request for offers by an importer extended to a number of potential suppliers. This request is usually made via fax machine or email, and details the importer's requirements for quality and quantity, as well as the terms and conditions submitted offers must meet. The offers (or bids to sell) may be opened in public or privately, in a formal or informal manner.

Formal bids are often submitted in sealed envelopes and opened publicly in either the importer's country or in the United States. Under a U.S. government financed export program, Public Law 480 (PL480), the IFB must be approved by the USDA, and offers are required to be opened in public, usually in Washington, D.C. The following is a list of the essential components of an IFB, components that will form the basis of the subsequent contract for U.S. feed grains:

Buyer

The importer should clearly state the full, legal name of the entity making the purchase, contact information (address, telephone, fax) and the date the IFB is issued.

For example:

"The Embassy of Pakistan, on behalf of the Ministry of Food and Agriculture, Government of Pakistan (the purchaser), solicits bids ..." (dated on official embassy stationary).

Time

The importer should state the time by which offers must be received by the importer (or his agent) and the time by which the importer's acceptance of the offer must reach the supplier. The longer the amount of time the offers must remain valid, the greater the risk

premium (cost) the supplier will build into the price. Normally, an offer is made in the afternoon, following the close of the U.S. commodity futures exchanges, with a reply expected that same night or prior to the opening of the future's exchanges on the next day.

For example:

"Bids must be received by 23 August 2003 at 3:30 pm Eastern Standard Time (EST), and must be valid until 10:00 am EST 24 August 2003.

Quality

Grain quality is determined by the official U.S. Standards for Grain, which governs the classification and grading of grain based on several qualitative factors. U.S. feed grains quality and grading standards are discussed thoroughly in Chapter 4.

The importer should specify maximum and minimum grade determining factors required and confirmed by an official export grain inspection certificate, issued by the Federal Grain Inspection Service (FGIS) or an FGIS-authorized state agency. The importer may also specify non-grade determining factors desired and identify the testing agency authorized to perform these tests.

For example: "U.S. No. 2 or better yellow corn, maximum 15.0 percent moisture. Aflatoxin maximum 20 parts per billion as determined by independent lab."

The more precise the quality description, the better the chance the importer will be pleased with the quality obtained. However, an overly restrictive quality requirement can lead to a much higher purchase price.

QUALITY AND SHIPPING PERIOD:

The importer must specify the quantity desired and the exact unit of measure. For example: metric ton, long ton, short ton or hundredweight. This amount should usually include a tolerance of 5 or 10 percent of the desired amount. This tolerance allows the provider of the freight for the shipment the flexibility necessary to charter a vessel for the grain cargo. The importer should also specify the method that will be used to establish the price of the quantity above or below the mean contract amount. In most cases this tolerance is priced at the original contract price.

Another quantity issue is the weight of the grain and the certification of that weight. The shipped weight at the load port is usually the

weight that governs. Weights are determined by (or under the supervision of) the FGIS. The weight certificate is final at load and issued by FGIS or an FGIS-supervised state agency.

Occasionally, the weight determined at discharge will govern. In these rare cases, initial payment is still made for the shipped weight at load port, and an adjustment is made once the discharge weight is known. The discharge weight must be determined under procedures acceptable to the seller such as an independent surveyor. When an importer purchases using discharge weights as final, the exporter will usually add a premium to the price that reflects the normal estimated loss of grain in a discharge operation.

The shipping period (or in some cases, the arrival period) should be clearly stated in the IFB. Delays, extensions or charges for late shipment/delivery are covered under the provisions of the NAEGA and GAFTA contracts, discussed later in this chapter.

For example:

"50,000 metric tons (5 percent more/less at contract price) for shipment September 1 through September 20, 2003."

SHIPPING TERMS AND VESSEL TYPE:

Tied closely with the shipment period and quantity are the shipping terms and the type of vessel that will carry the cargo. If the importer will provide the freight, a free on board (FOB) contract, then the importer should specify:

1. The U.S. port or range of ports where the grain will be delivered, as well as the number of berths within the port the seller may deliver the cargo from.
2. The type of vessel should be stated (a self-trimming bulk carrier, tween decker or tanker, for example) and a rate of loading (load rate guarantee) for each vessel type, including a determination of when lay time will commence and how lay time will be counted to determine total loading time.
3. A statement declaring which party will assume the cost of spout stowing and trimming the cargo.
4. A demurrage/despatch rate.
5. A statement expressing the pre-advice (the minimum number of days the buyer will advise the seller of the vessel's expected arrival).
6. The rate of carrying charges the buyer will pay the seller in the event the buyer's vessel fails to file in the agreed upon period, as well as the interest rate charged if not included in the carrying charge amount.

Many of these details are covered in the standard NAEGA #2 Export Contract discussed later in this chapter. Vessel types are also discussed in detail in Chapter 5. The charter party, the contract for freightage between the importer and the vessel owner will also cover some of these items.

If the importer is requiring the seller to provide the freight as a cost included in the purchase - cost and freight (CNF) - the importer must provide the exporter with a daily discharge rate at the destination port in place of the load rate guarantee, and specify a minimum salt water arrival draft at the discharge Port and Berth, maximum vessel age allowed and any specific restrictions at the discharge port. The importer may also ask the seller to provide insurance on the cargo - cost, insurance and freight (CIF). The general terms governing these types of shipments are covered in detail in the GAFTA contracts discussed later in this chapter.

For example: "FOB unstowed/untrimmed basis one (1) self-trimming bulk carrier, one (1) safe port/one (1) safe berth U.S. Gulf of Mexico. Load guarantee 5,000 metric tons wwd shex eiu with demurrage/despatch 8,000/4,000. Buyer to give 10 days pre-advise of vessels probable readiness. Carrying charges shall accrue at the rate of 0.20 USD/metric ton per day, inclusive of interest."

PRICE AND PAYMENT TERMS:

The importer will state in the IFB whether the importer wishes to purchase with reference to a "flat price" or "on a basis," or whether the importer wishes to receive offers for both methods. A flat price offer is an agreed-upon amount to be paid per unit, usually stated in U.S. dollars per unit. Purchasing on a basis refers to the premium above or discount below a stated commodity futures exchange contract. For a detailed description of how a basis contract works, see Chapter 6. Most buyers use the metric ton as their unit for pricing.

Another issue related to price is the pricing of the tolerance. The contract must provide a method to handle pricing of the amount above or below the mean contract quantity.

The terms of payment required by the importer must be clearly stated. While the most common form of payment is the confirmed, irrevocable, documentary letter of credit payable at sight, other forms of payment exist and are discussed at length in Chapter 6. The importer should specify the documents necessary for payment.

For example:

"Prices to be quoted in U.S. dollars per metric ton."

"Payment by irrevocable letter of credit payable at sight to be confirmed in the seller's favor by a first class New York bank in time to be in the seller's possession, in good order, 15 days prior to beginning of shipment period or within 10 days of contracting and payable against the following documents:

- Commercial invoice
- Full set of clean, on board ocean bills of lading issued to order of shipper
- Official weight and grain inspection certificates
- Certificate of origin
- Phytosanitary certificate"

U.S. GOVERNMENT PROGRAMS:

Invitations for bids should also state which, if any, U.S. government program is to apply to the offer or contract, such as the credit guarantee program GSM-102.

U.S. REGULATIONS:

U.S. exporters and importers are subject to regulations which restrict the export or re-export of commodities to certain destinations. Exporters must present to the carrier or the U.S. Customs service a "shipper's export declaration" which names the ultimate and intermediate destinations of the cargo. The cargo cannot be delivered to any country that is not named on the declaration.

In addition, a "destination control statement" must be entered on the originals and all copies of the bill of lading and commercial invoice. This means the importer must agree to accept documents bearing the destination control statement.

For example:

"United States law prohibits distribution of these commodities to Libya, North Korea, Cambodia or Cuba, unless authorized by the U.S. government."

U.S. exporters also are subject to U.S. regulations on restrictive trade practices or boycotts. Exporters may not engage in transactions that require the exporter to refuse to do business with a country or individual for boycott reasons.

PURCHASING UNDER DIRECT NEGOTIATION:

The Invitation for Bid (IFB) is a standard, rigid document that allows all exporters invited to offer a known commodity for a fixed shipment (or delivery period). Parties using the IFB method of procurement almost always buy the cheapest offer from those presented with no negotiation. While this is acceptable to some buyers, many importers like to play a more active role in negotiating the terms and conditions of the purchase contract. These importers often engage in direct negotiation with one or more suppliers.

The individual pieces of the final contract (the quality, quantity, shipping terms, and so forth) must still be addressed by the buyer and the seller in a direct negotiation. However, purchasing directly allows the seller to suggest alternatives or options to the buyer that may significantly reduce the importer's purchase price.

For example, an exporter may be able to provide an importer with a discounted price for a slightly later shipment period, or the importer may benefit from taking a slightly higher moisture content in a particular purchase. Importers can compare prices and determine the best time and entity to purchase from. However, it should be noted that most exporters can easily figure out whether or not an importer is a serious buyer.

Regardless of the method used in the procurement process, the following standard form contracts are normally a part of any U.S. feed grains export transaction, and any potential importer should read these forms and understand them thoroughly prior to initiating any discussions with potential trading partners.

Standard Contract Terms

Once a buyer and seller agree on all the terms and conditions of an IFB, and a price is fixed, the IFB is converted into a formal grain contract and a contract confirmation is exchanged. Generally, the full-term agreement includes the IFB or, in some cases, the importer's standard terms and standard contract language such as that contained in the North American Export Grain Association's contract form No. 2 (NAEGA 2) or the Grain and Feed Trade Association's contract form No. 27 (GAFTA 27). Detailed descriptions of these two standard contracts follow.

NAEGA 2

NAEGA publishes a standard form contract. NAEGA 2 is the standard form for FOB contracts for bulk shipments of grain from the United States. See Appendix A for a copy of the NAEGA 2 form. Some important features of the NAEGA 2 contract include:

Weight: Clause 5 states that the quantity is to be final at the port of loading in accordance with the customary weight certificates.

Quality and condition final: Clause 7 states that the quality and condition are final at the port of loading in accordance with official inspection certificates. Delivery of higher grades of the same type and description is permissible.

Vessel nomination and delivery: Clause 8 states that the buyer is to provide or nominate to the seller the name of the vessel, its capacity and its date of readiness at the load port. This pre-advice must be made prior to the minimum number of days specified in the IFB or contract in order to allow the seller to have the cargo available for prompt loading. The pre-advice should be in writing and delivered to the seller by any means of rapid communication, covered in Clause 15. It is also the buyer's responsibility to advise the seller of any change in the vessel's date of readiness.

The buyer may substitute a vessel once if the new vessel is of approximately the same size and type and can be ready around the same time. If the substitute vessel was damaged to the point of incapacitation, a second substitute vessel would be allowed. Should the vessel arrive before the delivery period begins, the seller will allow the vessel to file and take its turn in the loading berth's line-up. However, the seller is not obligated to load the vessel before the delivery period begins.

Clause 8 states that delivery shall be made at the discharge end of the loading spout, in other words, FOB unstowed and untrimmed. All export elevators in U.S. loading ports charge fees for facility and/or use of the wharf, based on the vessel's tonnage, the cargo amount and/or the number of days berthed. The rates for facility charges change regularly and may be different for each export facility in a specific port.

Elevator tariff: The first sub-clause of Clause 8 of NAEGA 2 states that delivery is subject to the elevator tariff to the extent that the elevator tariff does not conflict with the terms of the contract. When the buyer's vessel is accepted by an elevator, this becomes a contract between the elevator and the vessel to abide by the regulations of

and be liable for the charges in the elevator tariff. This application is usually accompanied by documents which include but are not limited to the following:

1. Certification by the USDA that the vessel's cargo holds are clear.
2. Certification by the National Cargo Bureau (NCB) of the vessel's readiness in all compartments.
3. Evidence that the vessel has entered at a U.S. custom house.
4. Evidence that the vessel has been tendered to and accepted by the charterer (buyer).
5. Written description of the vessel and the proposed stowage.

Once the berth application is accepted by the elevator, the vessel is assigned a berth in chronological order in relation to other vessels, based on when the vessel filed. However, the elevator can change that order if operating difficulties arise. If the vessel is bypassed, it shall return to the line-up immediately after the bypassing vessel completes loading and vacates the berth.

The elevator can also require continuous loading of a vessel through 24-hour periods, with the overtime expenses charged to the vessel or split between the vessel and the elevator. If a vessel refuses to work overtime, it can be asked to vacate the berth in favor of the next vessel willing to work overtime.

Price: Clause 10 covers the price. The range of ports of loading and the number of port/berth options allowed by the importer should be stated here. Clause 10 also addresses the methods used to establish a settlement price for any quantity loaded and shipped above or below the mean quantity.

As the tolerance of most contracts is designed to facilitate the vessel loading, many importers simply specify that the tolerance will be settled at contract price.

Advice of shipment: When the cargo is delivered to the vessel, the seller must promptly advise the buyer of the delivery as specified in Clause 13. The seller must provide the vessel name, bill of lading date(s), quantity and quality.

Insurance: Clause 14 requires the buyer to secure marine and war risk insurance with first-class approved companies and/or underwriters. Written confirmation from the insurer must be presented at least five days prior to the expected readiness of the vessel. If this confirmation is not forthcoming, the seller must secure the necessary insurance and charge the cost to the buyer's account.

Late pick-up: Clause 18 specifies that the buyer is in breach of contract if the vessel fails to file and be accepted before the delivery period expires. The seller subsequently holds the grain at the buyer's expense, subject to the carrying grain contract charges agreed to during negotiation or included in the IFB.

Carrying charges, normally expressed as a fixed amount per ton or bushel per day, typically represent storage and insurance charges and can be inclusive or exclusive of interest charges, which are stated at a fixed rate or a rate related to the "prime rate" currently in force in New York City, N.Y. Interest charges are assessed from the first day following the last day of the delivery period of the vessel. Charges for storage and insurance are calculated from the first day following the last day of the shipment period on only that portion of the cargo that has not been loaded, as verified on a daily basis by the stevedore's loading log. The importer is responsible to pay for the carrying charges upon receipt of the bill for these charges.

Strike clause: The strike clause, Clause 20, applies if the seller cannot supply the commodity at the agreed-upon time due to events beyond his control. To invoke this clause, the seller must promptly notify the buyer of the problem and, if requested by the buyer, provide the documentation required by Clause 20. The seller's obligation to deliver is suspended while the circumstances continue. However, if the buyer is already on carrying charges when the strike clause is invoked, the carrying charges continue to accrue without interruption until completion of the delivery.

Arbitration: Clause 30 specifies that settlement of any disputes which may arise from or in connection with the contract should be settled by arbitration in the city of New York under the International Arbitration Rules of the American Arbitration Association (AAA). Under these rules, the AAA appoints a panel of three experts to hear and decide the case. The AAA's decision is final; there is no appeal. A copy of the Arbitration Rules of the American Arbitration Association can be found in Appendix C.

Load guaranty: Addendum No. 1 loading rate guaranty is an optional part of the standard NAEGA 2 contract, requiring the seller to guarantee delivery to the vessel of an agreed tonnage during a weather working day of 24 hours (subject to the exceptions in Clause 1 of Addendum No. 1). If the seller fails to deliver at the agreed rate, the seller will pay the buyer a penalty, called demurrage, at an agreed rate. If the seller delivers the cargo at a faster rate than guaranteed, the buyer will pay the seller a premium, called despatch,

at an agreed rate, usually half the rate of demurrage. Both the demurrage and despatch are paid for each day, pro-rated, of the time lost or saved. Addendum No. 1 includes such items as filing times, holiday time, overtime responsibilities, payment terms, documents necessary for claims and interest charges for failure to make payment on time. Importers should be fully aware of all the terms and conditions of this important and useful contract addendum as it is almost always included with the NAEGA 2 contract. A copy of Addendum No. 1 may be found in Appendix B.

**GAFTA 27
and GAFTA
30**

GAFTA, based in London, publishes several standard form contracts. GAFTA No. 30 is a standard contract for less-than-full cargo (parcels) bulk shipments of grain from the United States that are purchased under CNF or CIF terms, while GAFTA No. 27 is the contract form for full cargoes. Both contracts are to be found in the appendices.

Some important features of these contracts include:

Quality and condition final: Under GAFTA No. 27, Clause 5 and GAFTA 30, Clause 6 declares that quality as stated in the certificate of inspection at the time of loading shall be final. Delivery of higher grades of grain of the same type and description is permissible.

Quantity: Under GAFTA 30, the tolerance is at the seller's option, with two percent more or less at the contract price and a further three percent more or less to be settled at the CNF or CIF market price on the final bills of lading date. If more than one shipment is made under one contract, each shipment is to be considered a separate contract, but the quantity tolerance of the mean contract quantity will not change.

Under GAFTA 27, the tolerance is 5 percent more or less at contract price and an additional 5 percent, at the seller's option, to be settled at the CNF or CIF market price on the final bills of lading date. It is common, particularly under U.S. government programs, for all tolerances to be priced at the contract price.

Weights: Under both contracts, Clause 18 specifies that the entire cargo is weighed at loading. Any deficiency from the bills of lading weight (shipped weight) will be settled by the seller to the buyer; any excess, from the buyer to the seller. In each case, settlement is at contract price. In most cases, this provision is superseded by the terms of the contract.

Extension: If the seller fails to ship the cargo within the specified shipment period for which bills of lading must be dated, the seller has an additional eight consecutive days in which to ship the cargo as long as the seller notifies the buyer by the first business day that follows the expiration of the original shipment period. The extension clauses are Clause 10 in GAFTA 27 and Clause 11 in GAFTA 30.

These clauses also specify a formula to compensate the buyer for the extension, based on a percentage of the CNF or CIF price, and is deducted from the original contract price at time of payment.

Strike clause: Like the NAEGA No. 2 contract, GAFTA provides a strike clause to cover prevention of shipment because of riots, strikes or lockouts. The strike clause is Clause 23 in GAFTA 27 and Clause 24 in GAFTA 30. The clause is invoked if causes occur during the last 28 days of the guaranteed shipment time (if the guaranteed shipment time is greater than 28 days) or at any time if the guaranteed time is less than 28 days. In order to invoke the clause, the seller must send notice by cable or fax no later than two business days after the last day of guaranteed shipment.

Arbitration: Clause 30 of GAFTA 27 and Clause 31 of GAFTA 30 specify that all disputes arising from the contracts will be settled by arbitration in London, England, in accordance with the arbitration rule No. 125 of GAFTA. Under this rule, the parties each appoint their own arbitrators who in turn choose a third arbitrator. GAFTA arbitration rulings can be appealed. However, the parties must obtain an award from the arbitrators or a board of appeal before any legal action may be claimed with respect to any dispute arising under the contract. See Appendix F for a copy of arbitration rule No. 125 of GAFTA.

Insurance: Unless terms are CIF, the buyer is responsible for securing marine insurance. Clause 22 of GAFTA 30 and Clause 21 of GAFTA 27 show that the type of insurance the seller must provide is "free of particular average" (FPA), along with war and strike risk insurance. FPA insurance does not cover damage unless the vessel is sunk, stranded, on fire or in a collision, in which case it covers all the resulting damage. On an invitation for offers of a CIF basis, buyers can ask for either "with particular average" (WPA) or "all risk insurance" (ARI), but these cost more and the offered price will be correspondingly higher. WPA insurance includes coverage as provided under FPA, but adds coverage for damage caused by seawater or inclement weather. ARI insurance covers all risks of physical loss or damage from external causes.

Appropriation (advice of shipment): FOB contracts require the seller to notify the buyer of delivery, while CNF and CIF contracts require the seller to notify the buyer of shipment. Clause 12 of GAFTA 30 and Clause 11 of GAFTA 27 provide the appropriate clause in detail. Such a clause is required to insure that the buyer has timely notice of the vessel name, the date of the bill(s) of lading, the quantity loaded and the contract number to which the shipment applies.

This section will take a look at some of the basic documents used in the international feed grains trade. These documents constitute the core of the transaction and are the mechanism by which title, or ownership, of the cargo is transferred from one party to another.

Basic Documents Employed in the Grains Trade

The Draft: A draft is an instrument by which one party directs another party to make payment and/or acceptance. The exporter, who is requesting payment, is the drawer, and the importer, who is responsible for paying the draft, is called the drawee. In order to be negotiable, such instruments:

1. Must be in writing and signed by the drawer;
2. Must contain an unconditional promise or order to pay a certain sum of money;
3. Must be payable on demand or at a fixed, determinable future time;
4. Must be payable to order or to bearer;
5. Must name the drawee or otherwise indicate the drawee therein with reasonable certainty.

Drafts can be drawn payable on demand and are called sight or demand drafts. Drafts also may be time drafts, which are payable at a later date. The type of draft depends on the payment or finance method used by the importer. The draft covering the export of grain and co-products from the United States is generally expressed in U.S. dollars but may also be expressed in other currencies. The draft may be payable either to the drawer or exporter, but more often it is payable to the seller's bank. Exhibit 1 in Appendix G gives an example of a sight draft.

Invoices: The most common invoice used in the grain trade is the commercial invoice, which is a bill for the purchased grain and is non-negotiable. It describes the goods being sold and the amount to be paid by the importer, including any charges in connection with the shipment of the grain as well as the terms of shipment (FOB, CIF or CNF).

The invoice should be dated and contain the name and address of both the exporter and the importer, the name of the vessel (or carrier), the port or location of loading and, in the case of a CIF or CNF transaction, the name of the destination.

There may be additional requirements in order to comply with customs and exchange controls in the importer's country, including the use of an additional customs invoice. The description of the goods sold in the commercial invoice must correspond exactly with the description contained in the letter of credit if this payment method is used. The commercial invoice also should be consistent with the information contained in other documents accompanying the invoice. See Exhibit 2 in Appendix G for a sample commercial invoice.

In addition, some countries require a legalized or consular invoice to accompany the commercial invoice and other shipping documents. This invoice is simply a commercial invoice that must be presented, legalized and given a visa or stamp by the embassy or consular office of the importer's country.

Bills of Lading: The bills of lading convey title to the goods therein described. It is a contract by a carrier for the delivery of the goods and a receipt by the carrier for the merchandise being shipped. The bills of lading should show the name of the shipper, the vessel or carrier transporting the goods, the type of grain being exported, the port or location of shipment, the destination, the consignee and the party to be notified upon arrival of the grain.

Bills of lading can be issued in two forms: "straight" (non-negotiable) or "to order" (negotiable). Some countries prohibit the issue of "to order" bills of lading. In such cases, the seller normally consigns the "straight" bill of lading to an agent or bank at the destination, with instructions to release the bill(s) of lading to the buyer only upon confirmation of payment. The shipping company should not surrender the bills of lading without the agreement of the agent or bank. If the "straight" bills are consigned to the buyer, the buyer can take possession of the goods upon identification without being required to present the bills of lading themselves.

Most bills of lading used in exporting feed grains are charter party bills of lading "to order." They are issued by the steamship company in two or three original sets, each of which is negotiable. Thus, any one set gives the holder title to the goods. The presentation of any properly endorsed original will allow a holder to pick up the merchandise at the port of destination. The bills of lading may be

endorsed in blank or endorsed to the buyer, his agent or some other third party.

The bills of lading must contain a dated "on board" endorsement initialed by the carrier or its agent indicating that the grain has been loaded. Exhibit 3 of Appendix G shows a sample bill of lading.

Insurance Policy or Certification: The contract between the buyer and the seller should specify the extent and the value of insurance coverage for the feed grain, which party is required to obtain the policy or certificate and who must pay for the insurance. The coverage available under marine policies can range from specific risks, such as fire, collision or sinking, to general "all risks" coverage. However, all risks coverage does not necessarily cover war, strikes, riots and civil commotion. Such circumstances could require special endorsements or policies, such as war risk insurance.

Official Export Inspection Certificate: Under the U.S. Grain Standards Act, grain being exported must be officially inspected by USDA-licensed inspectors from either the Federal Grain Inspection Service (FGIS) or an FGIS-authorized state agency, who will then issue an official certificate showing the commodity type, class, grade, quality, condition and quantity of grain and the loading location. Some importers may also require a copy of the official grain inspection log, which is a record of the individual lots of grain that comprised the cargo. A sample inspection certificate is shown as Exhibit 4 in Appendix G.

Official Grain Weight Certificate: In addition to the official inspection certificate, FGIS or an FGIS-authorized state agency will issue an official weight certificate which indicates the net weight, date and place of issue, the name of the carrier, location of the grain, kind of grain and the date and time the loading started and finished. A sample weight certificate is shown in Exhibit 5 of Appendix G.

Phytosanitary Certificate: A phytosanitary certificate is issued by the USDA's Animal and Plant Health Inspection Service (APHIS) or an authorized state agency. The document certifies that the grain being shipped is free of quarantine pests and generally conforms to the phytosanitary requirements of the importer's country. A sample phytosanitary certificate is shown as Exhibit 6 of Appendix G.

Certificate of Origin: A certificate of origin is normally issued by the exporter and certified by a recognized chamber of commerce and certifies that the grain is a product originating in the United States of America. The certificate identifies the seller or the agent and the

name of the carrier, and it gives a general description of the commodity. A sample certificate of origin is shown as Exhibit 7 in Appendix G.

Other Documents: Some other documents often required by importers include: a certificate of fumigation, often provided by a certified fumigation company or marine chemist; a certificate from a private laboratory for quality tests not covered under the official grain inspection certificate; an official stowage examination certificate, stating that the vessel holds were duly examined prior to loading and found to be substantially clean; and a crop year certificate, usually issued by the supplier, certifying that the feed grain loaded was grown in a certain crop year.

Landing Certificate: While landing certificates are not required by the importer, the exporter may require this document. When utilizing commercial U.S. government programs (namely, the GSM credit guarantee programs and the Export Enhancement Program), exporters are required to obtain and maintain official records that can demonstrate to USDA the commodity actually arrived at the importer's designated destination. The records or documents must be in English or be accompanied by a translation acceptable to USDA. Records acceptable to meet this requirement include an original certification of entry signed by an authorized customs or port official of the importing country, by the importer, by an agent or by a representative of the vessel or shipping company which delivered the commodity to the importing country or by a private surveyor in the importing country. Important points which must be included in a landing certificate are:

1. Certification that the commodity entered the importing country;
2. Identification of the export carrier;
3. Quantity of the commodity sold;
4. Kind, type, grade and/or class of the agricultural commodity;
5. Date and place of unloading of the commodity in the importing country.

Grain Quality and U.S. Standards

One of the major strengths of the U.S. grain production and marketing system is the variety of grades, classes and prices that it can offer customers around the world. Dramatic differences in topography, soils and climate from one region to another make this variety possible. By building on these natural advantages, seed breeders, public and private researchers, farmers, grain handlers and merchandisers are continually seeking to expand both the type and quality of grain the United States can make available to its customers.

The ability to provide such a broad spectrum of agricultural products gives buyers the opportunity to purchase exactly what they want. In the U.S. marketing system, quality requirements for grain exports are governed by both contract specifications and a complex, constantly evolving government-regulated system of guidelines that cover the inspection, sampling, grading and weighing of grain. These grain standards and inspection procedures are designed to ensure a uniform product and to facilitate the trading and marketing of U.S. grain.

FEDERAL GRAIN INSPECTION SERVICE

The Federal Grain Inspection Service (FGIS) is a program of the U.S. Department of Agriculture's (USDA) Grain Inspection, Packers and Stockyards Administration (GIPSA). FGIS administers a system for officially inspecting and weighing grain and other commodities through 12 field offices and two federal/state offices in the United States and Canada. FGIS field offices also oversee the work of state and private agencies which provide official services at other domestic grain markets. Eight of these state agencies are also authorized to perform official export services at ports.

U.S. Grain Standards Act

The U.S. Grain Standards Act, with few exceptions, requires official certification that export grain sold by grade has been inspected and weighed. Official services are provided upon request for grain in domestic commerce. The Agricultural Marketing Act of 1946 authorizes similar inspection and weighing services for rice, pulses and certain other commodities.

Congress passed the U.S. Grain Standards Act in 1916 at the request of local trade and governments that wanted a national inspection program and, for the first time, a national weighing program.

The U.S. Grain Standards Act provides for the establishment of official U.S. grain standards that are used to measure and describe the physical and biological properties of the grain at the time of inspection. The grades, classes and conditions reported on official certificates are determined according to the factors defined in these standards. These factors may include test weight per bushel and percentages, by weight, of damaged kernels, foreign material, broken kernels and other factors. The certificate also notes specific conditions of the grain, such as moisture content and infestation. No seasonal adjustments are made on U.S. grades.

Standards exist for 12 grains (listed from largest to smallest volume inspected): corn, wheat, soybeans, sorghum, barley, oats, rye, flaxseed, sunflower seed, canola, triticale and mixed grain. Commodities such as rice, pulses and hops have similar standards for grade and quality factors.

Other commodities and a wide range of processed products, including flour, food mixes, edible oils and other cereal food products, have no official USDA standards. FGIS can perform the physical, chemical and microbiological tests - using the official laboratory methods of the Association of Official Analytical Chemists - requested in laboratory specifications.

Standards used to inspect grain and other agricultural commodities are updated regularly through public rule-making procedures and represent currently accepted market practices.

With a few exceptions, the official inspection of export grain is mandatory. Official personnel employed or licensed by FGIS obtain representative samples using approved equipment. The grade is reported on a certificate which represents the entire lot inspected.

Other services available upon request include the determination of protein and falling numbers in wheat, oil in sunflower seed and aflatoxin in corn. FGIS performs stowage examinations within 24 hours before loading to assure that carriers are clean, dry and fit for loading. FGIS is required by law to collect fees that cover the cost of these services.

FGIS also works closely with other U.S. government agencies. For example, if FGIS were to find excessive levels of aflatoxin in corn, this would be reported to the Food and Drug Administration (FDA) for action to prevent the cargo from entering commercial channels. FGIS also works closely with the Animal and Plant Health Inspection Service (APHIS) to report insects found during inspection when the importing country has specified phytosanitary restrictions. The cooperation between U.S. government agencies is designed to assure that overseas customers receive the quality of grain desired.

There are some unofficial, private inspection agencies in the commercial business of providing inspection services or quality information, such as trace metal analysis, mycotoxin testing for other than aflatoxin, and testing for zearalenone and T-2 toxin using methods governed by the American Association of Cereal Chemists and other similar entities. FGIS does not have any authority over unofficial agencies, and the certificates issued by unofficial agencies are not FGIS certificates.

Before FGIS can establish, revise or repeal any of its standards, rules and regulations, it is required by law to announce its intentions in the *Federal Register*. The *Federal Register* is a publication that records all changes or proposed changes in federal regulations. These changes must be published and the public offered opportunity for comment before they go into effect. FGIS sends copies of FGIS *Federal Register* notices and proposals electronically to the agricultural offices of U.S. embassies worldwide, and will send any of its *Federal Register* announcements to anyone who requests them. The agency also publishes its *Federal Register* actions in news releases.

A *Federal Register* announcement includes a description of the action, rules the action would replace or affect, the effective date, reasons for taking action, objectives and effects of the action and an impact analysis (for major regulations). The announcement also includes the identification and addresses of FGIS contacts, a summary of the comments received on previous announcements and text or amending language to be used as text of the regulation or

action. The final rule includes exact language amending the regulation.

Changing the grain standards is a lengthy process, requiring at least one year from initiation until implementation. The public is given the chance to comment throughout the rule-making process, including:

1. Before rule-making at preliminary public and private meetings, or in writing to agency officials whenever an individual, company or group has a concern;
2. During the comment period published in the *Federal Register* notice to change or establish a standard;
3. During the comment period published in the *Federal Register* "Proposed Rule."

FGIS usually allows a 60-day comment period for *Federal Register* actions that would change or establish a standard, and FGIS may allow additional time for comment to parties who request an extension. Oral and written comments should be addressed to the contact identified in the *Federal Register*. FGIS has a special e-mail address, published in the *Federal Register*, which can be used for submitting comments. Changes to the standards usually take effect one year after publication.

Official Weighing Procedures

With few exceptions, official weighing is mandatory for all grain exported from the United States. During weighing operations, technicians employed or licensed by FGIS observe and verify the weighing and loading of grain and monitor scales and grain flow security. The weight may be certified separately or included on the official inspection certificate. "Class X," or official supervision of 100 percent of the weighing process, is required on export grain.

The scales used for the official weighing of grain and commodities must be installed and operated under FGIS guidelines. Scales at export elevators are tested every six months and must remain accurate to the nearest one pound per 1,000 pounds. Accuracy of the standard weights used to calibrate scales is verified every three years, or as needed.

In addition to scale testing, FGIS calibrates 13 railroad master track scales to the National Bureau of Standards' official track scale under an agreement with the American Association of Railroads. These master scales calibrate track scales across the United States.

HOW GRAIN IS WEIGHED

Most U.S. grain is weighed on an electronic weighing system. The system consists of a load receiving element (i.e., weigh hopper, platform, etc., with load cells), an indicating element (i.e., digital instrument), a printer and the associated material handling equipment. The load cell senses the amount of the applied load in the load receiving element and produces an output voltage that is sent to the digital instrument. The digital instrument converts the output voltage into a digital display. The tape printer records the digital display onto a tape or ticket for a permanent record.

Levertronic Scales

There are two types of electronic scales: levertronic and full electronic. Levertronic scales are mechanical scales that have been converted to electronic scales by inserting a load cell into the lever system. The dial used to obtain and print a weight is replaced with a digital instrument and printer.

Full Electronic Scales

In full electronic scales, the load receiving element is either supported by, or rests on, the load cells.

Digital Instrument with Printer

Digital instruments, printers and control boards are located in the control room. The control room is the operations control center for the export elevator. It may be located in the elevator or in a building separated from the elevator.

A digital instrument may have some sort of control that allows the operator to manually or automatically operate the gates of the garner and the scale. In the manual mode, the operator controls the operation of each cycle; in the automatic mode, the scale cycle repeats in succession.

Elevator personnel control equipment with computer graphical displays interfaced to equipment in the elevator. FGIS monitors grain flow with these same graphical displays. Elevator personnel can control bin selection, tripper movement, diversion points, legs, conveyor belts, slides and gates from this board. Official weighing personnel monitor export grain flow after weighing and sampling to assure that all of the grain weighed and sampled is actually delivered to the vessel.

Scale Tapes

In supervising manually operated electronic weighing systems, the official weigher continually verifies that the weight value displayed on the digital instrument is the same as the printed value on the scale tape of the ticket to assure proper system operation and to detect any printer malfunction.

The weight of each draft is added to determine the subplot total. The official weigher records the number of the subplot on the tape and initials the total weight. When the tape is removed from the printer, the official weigher records the time, carrier identification, kind of grain, tape number and scale numbers. If this information is printed on the tape automatically, the weigher verifies the accuracy of the information and initials it.

Since 1989, FGIS has been encouraging export elevators to install automated systems to monitor grain flow paths, maintain weight records, and activate alarms and shut-down devices, if necessary. Such systems can monitor flow paths more diligently than humans and are less likely to record erroneous weights. In addition, they can prompt personnel to perform scale checks and reduce the need for inspection personnel to visit sites inside the elevator. As entering the elevator always involves some risk, an automated system improves safety. The elevator benefits because a properly functioning automation system allows FGIS to operate with a smaller inspection team, and hence charge smaller fees. The elevator is responsible for contracting for the design and installation of the official automated system because it must be integrated with the elevator's own control system. FGIS advises the elevator and contractors during the development of the system, and carefully checks out the system for security and functionality before approving its use. FGIS assumes control of the automated system after its approval. Repairs and upgrades are made by the elevator's automation contractor, but must be approved beforehand and checked out afterward by FGIS.

Official Inspection Procedures

In order to be officially graded, grain must be inspected according to the provisions of the U.S. Grain Standards Act. This means that the equipment and procedures used must be approved and checked regularly for accuracy and that inspectors must be tested for proficiency in carrying out their inspection duties. The U.S. Congress has given FGIS responsibility for carrying out this work. There are five basic operations performed when officially inspecting and weighing grain going aboard a ship: stowage examination, sampling, weighing, inspection and certification.

STOWAGE EXAMINATION

A stowage examination is an inspection that determines if a carrier is fit to receive grain. To be considered fit, the carrier's stowage area must be clean, dry, free of odor and infestation and otherwise suitable for receiving or storing grain, insofar as the suitability may affect the quality, quantity or condition of the grain.

To determine cleanliness, stowage space is examined for:

1. **Previous Cargo.** If the stowage space contains fertilizer, old grain, loose cement, coal, lime, dunnage, refuse or other debris, the space is declared unfit for loading.
2. **Rust Scale and Paint Scale.** Rust scale and paint scale must be checked to see if they could become dislodged from the carrier and contaminate the grain. Loose scale will break when struck with a fist or when light pressure is applied with a knife blade under the edge of the scale. The use of safety goggles is recommended when scraping rust or similar material. Rust scale should not be confused with oxidation rust, which forms on exposed metal surfaces. Oxidation rust will not flake off when light pressure is applied. For ships, the area is declared unfit when a single area of loose rust scale or paint scale is more than 25 square feet (approximately 2.3 square meters), or several patches of loose rust scale or paint scale together exceed 100 square feet (approximately 9.3 square meters).
3. **Unsanitary conditions.** If the stowage space contains any animal filth, rodent excreta, bird excreta, decaying animal or vegetable matter, sewage or any other unsanitary conditions, the space is declared unfit for loading. Sites close to the hatch (e.g., ship deck, top side of the hatch cover) also must be clean.
4. **Unknown substances.** If any unknown substances are found, the space is declared unfit for loading. All unknown substances are considered contaminating. FGIS does not try to identify them but, if possible, FGIS will take samples of the substance and show them to the supervisor for future reference.

To determine dryness, the stowage space is examined for hydraulic fluid, standing water, puddles or any amount of leaking water; if any of these are present, the space is declared unfit for loading.

Inspection Equipment

Condensation, commonly called "sweating," can form on bulkheads or lower decks. This is unavoidable and poses no threat to the grain.

If the stowage space is contaminated with the odor of petroleum, an oil-based chemical, decaying animal or vegetable matter, or any other commercially objectionable foreign odor, the space is declared unfit for loading.

Finally, the stowage space is examined for infestations of rodents and/or insects. The discovery of any live rodents or more than two live insects injurious to stored grain will result in the space being declared unfit for loading.

Moisture: The moisture content in the grain is determined by a standardized DICKEY-john Grain Analysis Computer GAC2100. Moisture does not influence the numerical grade or any special grades. However, it is determined on all shipments and reported on the official certificate.

The sample requirement is approximately 350 grams, but the GAC2100 does not require weighing a portion size. Pour the sample through the divider at least once (to mix the sample) before filling the hopper.

Handle all cold samples quickly to reduce the possibility of condensation in a warm room. Samples on which snow or ice has melted or which contain snow or ice, are unsuitable for moisture testing. The built-in GAC2100 instrument temperature range limit is 10-40 degrees Celsius (50-104 degrees Fahrenheit). The sample temperature range limit is 0-40 degrees Celsius (32-104 degrees Fahrenheit). The sample-to-instrument temperature difference limit is 20 degrees Celsius (36 degrees Fahrenheit). If the instrument finds any of these limits exceeded, it will not display moisture results.

Keep all samples in sealed moisture-proof containers if they cannot be tested within approximately 15 minutes. Do not use paper bags, fiber cartons, or similar containers that allow moisture losses. Use metal cans, plastic containers and plastic bags to preserve the sample integrity. Do not file samples with paper identification inserted in the grain. Paper absorbs moisture and lowers the moisture of the grain.

Paper bags, fiber cartons and so forth are not used as moisture sample containers. Containers found to be the most practical for use in determining moisture are moisture-proof, plastic 475-ml

containers with openings of approximately 45 mm. Paper identification should not be inserted in the grain samples.

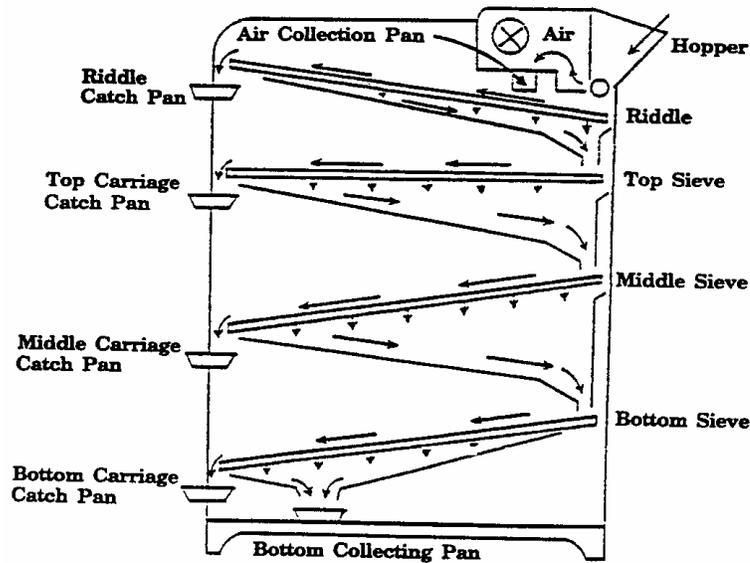
Because of wide variations between room and grain temperatures throughout the year, it is not possible to predict exactly how long after the thermometer has been inserted into the grain that the temperature should be read. Generally, three to five minutes is sufficient to obtain an accurate temperature.

Dockage: Dockage is a factor determined for barley, flaxseed, rye, sorghum, triticale and wheat, but not for other grains. Dockage consists of material which can be easily removed by machine and includes material lighter than, larger than and smaller than the grain.

Dockage is determined with a special machine called the Carter Dockage Tester, which uses aspiration (air) and a combination of riddles and sieves to remove materials lighter or of a different size than the grain. The flow chart below describes the testing process.

Like moisture, dockage does not influence the numerical grade of the grain, but it always is determined and reported on the certificate.

After dockage is removed, a portion of the sample is manually examined for foreign material, which is all material remaining in the sample other than the predominant grain. Foreign material includes materials which could not be separated mechanically, such as seeds and other grains similar in size and weight to the grain.



The Dockage Tester also is used to determine the percentage of broken corn and foreign material in corn. Broken corn and foreign material is a grading factor in corn.

Test weight per bushel: Test weight per bushel is the weight of the grain required to fill a level Winchester bushel measure (approximately 35.2 liter capacity). The factor "test weight per bushel" is determined using an approved apparatus which has a kettle capacity of 1 dry quart (approximately 1.1 liters). This determination is made on a representative portion of grain, not less than 1 1/8 to 1 1/4 quarts (1.2 to 1.4 liters) cut from the representative sample using a Burner divider.

Test weight per bushel is a grading factor. Generally, it is expressed in pounds per Winchester bushel, but upon request it will be converted to kilograms per hectoliter.

To determine test weight, the work sample is poured into the closed hopper which is centered over the kettle. The valve is opened to allow the grain to fill the kettle. A standard stoker held in both hands with the flat sides in a vertical position is used to remove the excess grain from the top of the kettle with three full-length, zigzag motions. The kettle is hung on the beam, and the beam weights are moved until the beam is perfectly balanced. Then the test weight per bushel is read.

Detailed grades and standards for barley ensure that importers receive exactly the type and quality of barley that they want. There are over 100 varieties of barley grown commercially in the United States and an importer can specify an order detailed as to an individual variety if needed.

***Official U.S.
Standards:
Barley***

For most importers, simple grade specifications will suffice to guarantee the buyer gets exactly what is needed. A typical barley requirement will define the grade (No. 1 through sample grade), the type (two-row or six-row barley), the minimum or maximum protein level, moisture levels, test weight and foreign material tolerances. If the barley is being purchased to make malt, germination and plumpness levels should be contractually stipulated.

Barley is an excellent feed grain for growing and finishing livestock animals. The relatively high protein content in barley reduces the need to supplement feed rations with high protein additives, which reduces the cost of that ration. Differences between barley varieties

have little effect on animal performance; both feed and malting varieties have proven to be excellent animal feed. Barley is divided into three classes based on kernel characteristics: six-row barley, two-row barley and barley. The class barley has no subclasses; six-row barley and two-row barley are divided into subclasses based on their malting qualities.

Six-row malting barley is divided into three numerical grades, and two-row malting barley is divided into four numerical grades. All classes on barley not designated as "malting" are divided into five numerical grades and U.S. Sample grade. Special grades are provided to emphasize special qualities or conditions affecting the value of barley and are added to and made a part of the grade designation. They do not affect the numerical or sample grade designation. In general, a kernel of barley is considered damaged for inspection and grading purposes only when the damage is distinctly apparent and recognized as damaged for commercial purposes.

Blight-damaged kernels are kernels and pieces of barley kernels that are covered at least one-third or more with fungus or mold. Blight discolorations should not be confused with badly stained, weathered or water-stained kernels or kernels that have black discoloration on the tip of the germ end due to weather conditions. Barley containing more than 4 percent of blight-damaged kernels is designated "blighted."

Malt-damaged kernels are kernels and pieces of barley kernels that have undergone the malting process and show any degree of sprout.

Frost-damaged kernels are kernels and pieces of barley kernels that are badly shrunken and/or distinctly discolored black, brown or green by frost.

Germ-damaged kernels (sick and/or mold) are kernels and pieces of barley kernels that have discolored germ due to heat or mold from respiration. This includes barley injured by heat.

Heat-damaged kernels are kernels and pieces of barley kernels that are damaged by heat. The determination for heat-damaged kernels is made on a pearled portion.

Weevil or insect-bored kernels are kernels and pieces of barley kernels that have been bored or tunneled by insects.

Mold-infected kernels are whole kernels of barley that are covered 50 percent or more with a mold-like substance.

Sprout-damaged kernels are kernels and pieces of barley kernels that have sprouted, that have swelling over the germ and that show sprout after examination.

Dockage (DKG) in barley is non-barley matter removed from the sample by the Carter Dockage Tester. Dockage is recorded to the nearest hundredth percent, unless it is 1 percent or more.

Foreign material (FM) in barley is all matter that remains in the sample after the removal of dockage. FM is determined on 25 grams of dockage-free barley and is recorded on the official certificate to the nearest tenth.

To read the U. S. standards for barley issued by the Grain Inspection, Packers and Stockyards Administration, see Appendix C. Or visit :

www.usda.gov/gipsa/reference-library/standards/standards.htm

**Officials U.S.
Standards:
Corn**

There are six grades or standards for U.S. yellow corn: Grades No. 1 through 5 and Sample grade. No. 1 is the most desirable, followed by No. 2, down on to Sample grade. The vast majority of commercial trade within the United States is traded as U.S. No. 2 or No. 3. The corn milling and livestock industries use these grades as a standard, but routinely utilize grain of lower grades at a discount without difficulty. Along these lines, exports also are generally traded as U.S. No. 2 and No. 3.

Buyers should remember that these are guidelines the industry uses to facilitate trade and handling efficiency. The existence of these standards does not preclude the buyer from specifying, by individual factor, exactly what product the buyer wishes to buy. The U.S. grain handling industry is capable of providing, at a cost, nearly any level of tolerance the buyer is willing to pay for.

Corn is divided into three classes based on color: yellow corn, white corn and mixed corn. Each class is divided into five U.S. numerical grades and U.S. Sample grade. Special grades are provided to emphasize special qualities or conditions affecting the value and are added to and made a part of the grade designation. They do not affect the numerical or sample grade designation.

Broken corn and foreign material (BCFM) are determined using the Carter Dockage Tester machine. Broken corn (BC) is all matter that

passes through a 12/64-inch (4.8 mm) round-hole sieve and over a 6/64-inch (2.4 mm) round-hole sieve. Foreign material (FM) is all matter that passes through a 6/64-inch round-hole sieve and all that remains on top of a 12/64-inch round-hole sieve. All matter other than corn remaining in the sample is removed by hand (sweet corn and popcorn are considered FM.)

BCFM are recorded to the nearest tenth on the shipping log and the total of the two, BCFM, is recorded to the nearest tenth on the official inspection certificate. This information will provide the miller with the exact amount of millable and non-millable material. In general, a kernel of corn is considered damaged for inspection and grading purposes only when the damage is distinctly apparent and can be recognized as damaged for commercial purposes.

Blue-eyed mold damage occurs when a germ is infected with blue-eye mold, regardless of the amount.

Purple plumule is a genetic or varietal characteristic which does not constitute damage and should not be confused with blue-eye mold.

Cob rot is caused by a fungus that attacks weakened plants and produces a distinct coloration or rotting.

Drier-damaged kernels are kernels and pieces of kernels which are wrinkled, discolored, blistered, puffed or swollen in appearance. They are germ-damaged, with peeled or peeling seed coats or a fractured or checked appearance. Drier damage should not be confused with heat damage.

Germ-damaged kernels are kernels and pieces of kernels damaged by respiration or heat but not materially discolored.

Heat-damaged kernels are kernels and pieces of kernels that are materially discolored by excessive respiration, with the dark discoloration extending out of the germ through the sides and into the back of the kernel.

Heat-damaged kernels (drier) are kernels and pieces of kernels that are puffed or swollen and materially discolored by external heat caused by artificial drying methods.

Insect-bored kernels are kernels and pieces of kernels with obvious insect-bored holes, tunneling insect webbing or insect refuse. Kernels that are partially eaten but entirely free of refuse, webbing or other types of damage are not considered damaged.

Mold-damaged kernels are kernels and pieces of kernels infected with mold on the exposed endosperm. When a kernel is cracked or broken, the starch is exposed and it becomes susceptible to mold. Mold is usually blue or green in color. If the surface mold penetrates the kernel, it is considered damaged. Kernels that have dirt on them should not be confused with kernels containing mold.

Discolored kernels that contain a mold-like substance are considered damaged when whole kernels are 50 percent or more covered.

Surface mold (blight) - kernels and pieces of kernels that have mold caused by corn leaf blight. While it appears to the eye only on the surface, it actually penetrates the seed coat.

Mold (Pink Epicoccum) - kernels and pieces of kernels that have a mold-infected germ.

To read the U. S. standards for corn issued by the Grain Inspection, Packers and Stockyards Administration, see Appendix D. Or visit : www.usda.gov/gipsa/reference-library/standards/standards.htm

Sorghum is divided into four classes, based on tannin content and color: sorghum, tannin sorghum, white sorghum and mixed sorghum. The different types are identified by color but the characteristic which sets each apart from the other is tannin content.

**Official U.S.
Standards:
Sorghum**

Sorghum Classes:

1. Sorghum - Low in tannin content due to the absence of a pigmented testa (subcoat) and contains less than 98 percent white sorghum and not more than 3 percent tannin sorghum. The pericap color of this class may appear white, yellow, pink, orange, red or bronze.
2. Tannin Sorghum - Sorghum that is high in tannin content due to the presence of a pigmented testa (subcoat) and contains not more than 10 percent non-tannin sorghum. The pericap color of this class is usually brown but may also be white, yellow, pink, orange, red or bronze.
3. White Sorghum - Sorghum which is low in tannin content due to the absence of a pigmented testa (subcoat) and contains not more than 2 percent sorghum of other classes. The pericap color of this class is white or

translucent and includes sorghum containing spots that cover 25 percent or less of the kernel.

4. Mixed Sorghum - Sorghum that does not meet the requirements for any of the other classes.

Each class is divided into four numerical grades and U.S. Sample grade. Special grades are provided to emphasize special qualities or conditions affecting the value of sorghum. Special grades are added to and made a part of the grade designations. They do not affect the numerical or grade designation.

Nearly all sorghum that trades in export channels today is No. 2 grain sorghum. Buyers who intend to purchase sorghum for the purpose of feeding livestock will get better results with this low-tannin sorghum, which is now 99 percent tannin free.

Broken kernels (BN) are all matter which passes through a 5/64-inch (2.0 mm) triangular-hole sieve and over a 2 1/2 by 64-inch (1.0 mm) round-hole sieve. Foreign material (FM) is all matter, except sorghum, that remains on top of the 5/64-inch triangular-hole sieve. BN and FM are each recorded to the nearest tenth percent on the shipping log, and the total of the two (BNFM) is recorded to the nearest tenth percent on the official inspection certificate.

In general, a kernel of sorghum is considered damaged for inspection and grading purposes only when the damage is distinctly apparent and can be recognized as damaged for commercial purposes.

Germ-damaged kernels are kernels and pieces of kernels of sorghum that contain dark colored germs after leaching.

Ground and/or weather-damaged kernels are kernels and pieces of kernels that contain dark stains or discolorations and have a rough, cake-like appearance. This type of damage is caused by ground and/or weather conditions.

Heat-damaged kernels are kernels and pieces of kernels of sorghum that are materially discolored and damaged by heat. It is usually necessary to cross-section the kernels to determine if the color is creamy.

Mold-damaged kernels are kernels and pieces of kernels containing surface mold and should not be confused with dark stains or discolorations caused by ground and/or weather conditions.

Sorghum with a mold-like substance is considered damaged when over half of the whole kernels of sorghum or pieces of kernels are discolored and covered with a mold-like substance.

Sprout-damaged kernels are kernels and pieces of kernels where the sprout clearly protrudes from the germ. If there is a split over the germ area but no sprout protruding, it is not considered sprout-damaged.

Insect-bored kernels are kernels and pieces of kernels of sorghum that have been bored or tunneled by insects.

To read the U. S. standards for sorghum issued by the Grain Inspection, Packers and Stockyards Administration, see Appendix E. Or visit :

www.usda.gov/gipsa/reference-library/standards/standards.htm

INTERPRETIVE FACTORS – VISUAL GRADING AIDS

The visual grading aids system was developed by the FGIS Board of Appeals and Review to assist inspectors in making subjective grading decisions and to reduce intermarket differences in inspection results. This system consists of Interpretive Line Slides and Interpretive Line Prints. Reference is made to the visual grading aids throughout the grain inspection manuals.

The Interpretive Line Slide System consists of a portable table-top viewer and photographic slide transparencies. The portable viewer uses a precisely controlled light source of desired intensity and quality. The Interpretive Line Slides are placed on the viewer at the inspection table to aid the inspector in making grading decisions.

The slides are designed for use with the special viewer only. If they are used in a normal slide projector, they will become bleached by the high intensity light, rendering them unusable for the comparative purposes for which they were intended.

Interpretive Line Prints are photographs exhibiting a particular attribute. These prints allow a more uniform application of the general appearance factors. Both the Interpretive Line Slides and Prints are available for viewing at every FGIS Field Office and are available for purchase from the manufacturer.

Fumigation and Grain Protectants

A fumigant is a gas which penetrates the grain kernels and kills insects at all life stages: eggs, larvae and adults. Also, gas grain protectants are applied to the surface of grain and kill adult insects on contact, but do not kill insect eggs.

When a portion of cargo is graded "infested," the exporter can accept the official certificate with "infested" designation, return the infested cargo to the elevator or continue to load the vessel and then fumigate it in transit, following procedures specified by FGIS. If the exporter selects the last option, the "infested" designation is not reported on the certificate because the condition is considered remedied.

The fumigation of vessels in transit with an aluminum phosphide fumigant formulation is a widespread, proven safe practice.

The fumigation is performed by a registered applicator. FGIS personnel observe the fumigation to assure that it is performed according to correct procedures. FGIS requires the applicator to sign a statement on the applicator's company's letterhead stating that the fumigant was applied according to U.S. government regulations and the manufacturer's instructions.

Phytosanitary Certificate

When an importing country has phytosanitary regulations prohibiting the entry of certain pests, the U.S. government will examine the cargo for the presence of the prohibited pests and issue a phytosanitary certificate. This certificate is issued by the USDA's Animal and Plant Health Inspection Service (APHIS), not by FGIS.

UNIFORM INSPECTION PLAN/CERTIFICATE

During the loading of an export grain vessel, FGIS follows a uniform plan for sampling and inspection. A shipment or "lot" of grain is divided into "sublots" for the purpose of maintaining quality. The subplot size is based on the hourly loading rate of the elevator and the capacity of the vessel being loaded. A subplot may represent up to approximately 3,000 metric tons. The grade and factors determined on each subplot must meet, within specified tolerances, the official grades and factors requested in the applicant's load order. Sublots that do not meet specified tolerances can be removed from the shipment or certified separately. Otherwise, FGIS certificates represent the entire lot of grain based on the weighted average of subplot results at the time of loading.

The uniform inspection plan for shiplots is called the Cu-Sum Plan. It establishes statistically-based tolerances known as breakpoints for accepting those occasional portions of a lot that, due to known sampling and grading variations, may grade below the desired lot quality. The Cu-Sum Plan was adopted to ensure that the entire lot is of uniform quality.

The inspector uses an inspection log to record his findings for each subplot. Each log contains all of the factor results for each subplot, plus any other observations made by the sampler and inspector. It is a complete record of all inspection information concerning the lot. This record is retained by FGIS; however, a buyer can obtain a copy by requesting it in the contract.

The product of all analyzing, grading and monitoring is the Official Export Grain Inspection Certificate. There are two options under which shiplot grain can be loaded and certified. Under Option 1, the exact grade must be loaded; with Option 2, the exact grade or a better grade can be loaded. Option 2 gives the shipper more flexibility and gives the buyer a potentially better quality of grain.

While the grain standards denote a general level of quality, more stringent criteria can be requested in a contract. For example, if a buyer contracts for U.S. No. 2 or better yellow corn and 3 percent BCFM is excessive for the enduse, the contract can specify "U.S. No. 2 or better yellow corn, maximum 2.5 percent BCFM." However, more stringent criteria may command a premium price.

It is also important to specify in the contract all of the optional testing services FGIS is to perform, such as "aflatoxin testing to be performed by FGIS." If FGIS is not specified to perform the test, then it may be done by a private laboratory.

A sample of an inspection log is included at the end of the manual as Appendix K.

Complaints

If a discrepancy between grain quality at origin and destination occurs, an importer can register a complaint with the U.S. Embassy's agricultural counselor, attaché or trade officer. The embassy will then notify the USDA's Foreign Agricultural Service (FAS) in Washington, D.C., who in turn will notify the FGIS Office of International Affairs (OIA). The OIA will review the complaint, gather information about the reported discrepancy and respond to the complaint. However, FGIS does not issue a new certificate, nor does it function as an arbitrator between buyer and seller.

File samples are held for 90 days after loading. If they are available when the complaint is filed, they will be re-examined during the investigation. If a receiver chooses to submit a sample from destination, then it will also be examined. The FGIS findings are sent in a report through the U.S. Embassy to the originator of the complaint. The facts in the response are available to any person having financial interest in the grain.

GRAIN QUALITY IMPROVEMENT ACT OF 1986

The Grain Quality Improvement Act of 1986 required FGIS to revise certain procedures in order to enhance the quality of U.S. grain exports. The act addressed three primary areas: grain handling practices, insect tolerances and the usefulness of grain standards.

Before the implementation of this act, some elevator operators removed and stored dust, dockage and foreign material during grain handling to reduce dust levels in the elevator, then recombined it before loading the vessel. This practice is no longer permitted. While the act prohibits recombining dust that has been removed and stored, it does not require dust to be removed.

More stringent insect tolerances became effective in May 1988.

Finally, FGIS is required to study the need for additional end use value tests for grain.

For further information on U.S. grading and sampling standards, contact:

**Federal Grain Inspection Service, USDA/GIPSA
Room 1627 -- South
14th and Independence Avenue, SW
Washington, DC 20250
Phone: (202) 720-0226
FAX: (202) 720-1015
Email: John.B.Pitchford@usda.gov**

U.S. Export Facilities and Ocean Transportation

U.S. grains are exported from every coast in the country, as well as from the St. Lawrence Seaway in Canada. Each of the five export ranges that handle feed grains exports has a unique relationship with one or more interior producing regions. This relationship is characterized by the principal mode of transportation used to bring those feed grains into an export position.

Long before the first European explorer reached the majestic sweep of the Mississippi River, Native Americans were using it for travel and trade. The Mississippi River has evolved since then into a transportation gateway to the interior of the United States.

Mississippi River/Center Gulf

A fleet of over 10,000 barges, towed by as many as 2,000 towboats, ply the river with many different kinds of cargo. There are nearly 6,000 miles of navigable river in the Mississippi River Basin serving the Mississippi, Missouri, Ohio, Illinois, Arkansas, Tennessee, White, Cumberland, Alabama and Minnesota Rivers.

Through this system, river transportation reaches into every Corn Belt state, providing easy access to 80 percent of U.S. corn production, more than 33 percent of sorghum production and up to 15 percent of barley production. Hundreds of river terminals receive feed grains by truck or rail and transfer it into barges, each carrying approximately 1,500 tons, which are collected into tows of six or more barges and moved downriver to New Orleans or another river port.

Barge transportation is traded actively between suppliers and users, quoted in percentage of tariff, and a cost schedule established with prices for each river shipping point.

Although price varies over time with supply and demand variables, the average cost of transportation has been remarkably stable from the mid-1980s to the present.

Once in port, fast, modern, export terminals transfer feed grains from these barges into storage or waiting ocean vessels. There are a dozen such terminals along the lower Mississippi from Baton Rouge, La. to the Southwest Pass. Several of them can load more than 50,000 MT in a single day, drastically reducing the time a vessel spends in port and, consequently, the cost of moving cargo for the importer.

And, most importantly, this capacity is rarely taxed by demand. U.S. exporters have vastly overbuilt handling capacity over the years. This ensures the importer fast, efficient service at a fraction of the cost it would take to handle grain anywhere else in the world.

Some grain does move to the Center Gulf by rail. Trains of up to 120 cars, or 10,000 MT, carry feed grains to these same export facilities when economics warrant. However, rail movement must compete with cheap barge transportation to move grain from the same geographic regions that these barges serve. Rail rates are generally much higher and not only contingent upon the value a railroad places on its service in moving the loaded railcars to export, but also on the value of the cars themselves which are leased on a long or short term basis.

Although there are over 35,000 covered hopper cars in the United States capable of carrying feed grains for export, many of them are tied up in domestic hauls or in areas that do not have to compete with the barge market for export share. Nonetheless, in a given year, 10 percent of the grain delivered to Center Gulf ports arrives by rail.

Texas or West Gulf

There are several ports that handle feed grains along the Texas coast. Although they are principally wheat facilities designed to receive the trains of hard winter wheat that originate in Kansas, Oklahoma, Nebraska and Texas, they do service for feed grains, principally sorghum, grown in these states as well.

This grain arrives mostly by rail, except for truck deliveries that originate in coastal areas of Texas where sorghum and corn are both produced. Rail in multi-car units moves along the BNSF, Missouri Pacific, Southern Pacific and Union Pacific railroads to facilities in Brownsville, Corpus Christi, Galveston, Houston and Beaumont in Texas. Occasionally, in times of extreme transportation squeezes at

the Center Gulf because of river problems or concentrated demand, corn will move from Nebraska and Iowa to Texas, but this is quite unusual.

Many of these facilities are, except for their reliance on rail delivery, as fast and efficient as their Center Gulf counterparts. They are also extremely fast in loading vessels and keeping waiting time to a minimum.

The U.S. Atlantic Coast

Much like the Texas Gulf, elevation capacity on the U.S. Atlantic Coast has been contracting - elevators in Philadelphia and Norfolk have been shut down or destroyed. Still the Atlantic Coast has the capacity to elevate more than 18 MMT of grain. Facilities in Baltimore, Md.; Norfolk, Va.; Charleston, S.C.; and Savannah, Ga. can receive grain by rail and truck for export.

The export facilities in Norfolk compete with both the Center Gulf and Great Lakes ranges for corn origination out of the states of Illinois, Indiana, Michigan and Ohio.

When importers from Europe or North Africa are active corn buyers, the Atlantic Coast has an advantage over the Gulf because of its physical proximity to these destinations. For the most part, high rail transportation costs consume this freight advantage the Atlantic Coast has over the Gulf. Furthermore, each of the elevators that handle feed grains on the Atlantic has some kind of draft or vessel size restriction.

Pacific Northwest

The Pacific Northwest export range facilities have a freight advantage over the other ranges to destinations in the Pacific Ocean. This advantage works the same way as the advantage the Atlantic Coast has to destinations in that ocean. The much shorter distance from the Pacific Northwest to Asian destinations allows importers to pay a substantially higher price for feed grains delivered from that coast.

Again, like the Atlantic, the Pacific Coast range must compete with the Mississippi River system to originate feed grains for export. Even though the Pacific Coast has a large, consistent ocean freight advantage, it is still a long way from feed grains production areas. The reach of the Pacific Northwest (PNW) does not begin to cover the bulk of feed grains production. The ocean freight advantage can only cover a limited amount of ground in competing with the interior river system.

The Great Lakes

The Great Lakes comprise a unique inland waterway. Access to the Lakes' ports is through the St. Lawrence Seaway which consists of a lock system connecting Lake Superior and Lake Huron at Sault Ste. Marie and lakes Erie and Ontario (bypassing Niagara Falls) via the Welland Canal. The fresh water draft in the Welland of 7.9 meters (26 feet) restricts many vessels from entering the lakes and most of those that do from leaving fully laden.

A separate class of vessels has been built, since the completion of the Seaway, with the specific intention of plying the waters of the Great Lakes. Naturally, they have shallow drafts and narrow beams that just allow them to pass through the lock system. They are called Lakers and can carry about 25,000 MT of heavy grain. Grain loaded in these specialty vessels at lake ports is then discharged at export facilities in the St. Lawrence River.

Importers can charter a vessel to go into the seaway and load grain at a lake port, buy a portion of their cargo in the lakes (usually two-thirds) and load the balance at a St. Lawrence facility (the final third) or lift the entire cargo from a St. Lawrence facility. Differences in Laker freight, ocean freight, vessel size and port discharge capacity will determine which is most economical. One significant difference from the other ranges is that the buyer must decide whether the grain will be purchased on certificates issued at the interior lake port, or based on a new inspection (and/or new weighing) as it is transshipped. Although inspectors for the United States Department of Agriculture's (USDA) Federal Grain Inspection Service (FGIS) (see Chapter 4) are located in Canada, ordinarily a new inspection at the time of transshipment is not undertaken (and not unless specifically requested by the buyer). If a new inspection is not performed, the shipment is traded based on the original grade issued at the first load port; this is commonly known as "Western Inspection." This is, for the most part, a matter of indifference, but a buyer should be aware that a Western Inspection will be used unless a Seaboard Inspection at the time of transshipment is specified.

The price of lakes' freight, like barge and rail freight in the United States, trades freely over time and determines how competitive execution will be. Several the lakes' ports also double as points for delivery against the Chicago Board of Trade corn contract.

The Lakes are closed for the winter, generally from mid-December to early April, because of ice.

*Freight
Options for
the Overseas
Buyer*

The U.S. feed grains buyer is faced with an array of decisions that must be made before that grain arrives at its destination and can be consumed as feed or processed into new products. First, the buyer must decide which feed grain best suits the buyer's needs. Next is the question of how to get it to the importer's country. In nearly every case this will be by bulk shipment in an ocean going vessel.

Such questions may arise as: when and how important is the timing of the grain's arrival; how large a vessel is required; does it need to be geared or not; where will it take on fuel; who will insure the vessel and its cargo; and so forth. The buyer chooses how involved the buyer wants to be in these details by how the buyer purchases the grain.

The ultimate goal of any buyer is to bring goods to the intended destination at the lowest possible cost. Since there are two principal components to that landed cost - the value of the grain and the value of the transportation (ocean freight) required to get it there - a buyer would know the value of each before the buyer actually goes into the market to purchase grain.

A buyer has three choices when deciding how to buy the intended feed grain. Each choice has important implications for the division of responsibilities between buyer and seller.

Free on Board (FOB): The grain is delivered "end spout." As the grain is literally poured into the vessel's holds, the seller's responsibility ends. As contractually agreed, the seller will produce the quantity of grain, as weighed by the Federal Grain Inspection Service, during a specific period in a specific port or ports. The seller may even be willing to agree to a specific elevator berth if the buyer desires it. The seller is obligated to produce a grade certificate, again attested to by the Federal Grain Inspection Service, which satisfies the contract with the buyer. This can mean grain must be discharged for the seller's account if it does not meet tolerance; however, this is very rare. The seller's obligations generally end there. The buyer must present a suitable conveyance within the contracted shipment period. In the case of a shipment moving by sea, this entails the chartering of an ocean going vessel. If an importer buys grain FOB, the importer must present the vessel and handle the logistical details in bringing the loaded cargo to destination. This will include appointing agents to oversee loading and documentation, monitoring the vessel's progress as it sails and settling claims with the vessel loader in addition to chartering the vessel.

Cost and Freight (CNF): The seller contractually agrees to deliver the grain to the destination of the buyer's choice, providing both commodity and transportation. The buyer obligates to provide discharge facilities, usually specifying, and guaranteeing, the port conditions (draft, available berth and so forth) at destination. Title passes upon the issuance of bills of lading even if the buyer has not actually paid for the grain, though in most cases the seller will use those bills of lading, along with the rest of the vessel's documentation, to collect payment due under the contract. Effectively this means the importer "owns" the grain on board the vessel even though it is still weeks from its destination and the buyer has bought it delivered. Consequently, the buyer should insure the value of that cargo against loss. Technically, though, the seller, as vessel charterer, still controls the vessel's movements though the buyer may already hold the bills of lading, which controls the disposition of the cargo.

Sound confusing? It is. Even today, several centuries into the practice of maritime law, disputes still arise over the infrequent case where a buyer and seller order vessel and cargo to move at cross purposes.

Cost, Insurance, Freight (CIF): This is similar to buying grain CNF except that the seller is responsible for insuring the value of the cargo. In practice, grain sold CIF is usually done so under deferred payment or credit terms where the seller is extending that credit and retains title to the grain prior to discharge. Occasionally, an exporter will load a cargo unsure of which sale it will fill or perhaps load a cargo without a sale, hoping to find a buyer once the grain is afloat. On these occasions, the seller will be self-insuring the cargo value and deliver it CIF at the appropriate time.

Responsibilities of buyer and seller are very similar to those under terms of a CNF contract. The title question is just as confusing, though it generally passes to the buyer with the transfer of the bills of lading.

Every importer should consult a lawyer well versed in U.S. and maritime law, as well as local statutes, before contractually agreeing to buy feed grains under any terms.

Chartering a Vessel

There are two ways to charter, or contract to "hire," a vessel: by time charter or by voyage charter.

Time Charter: In a time charter the vessel owner contracts to turn over the ship, complete with its crew, to the disposition of the charterer in return for a daily fee. Contractually the two parties agree to many details - the most important being the daily rate, the period of hire, where the vessel is delivered by the owner to the charterer and where it is to be returned by the charterer back to the owner. Upon receiving the vessel, the charterer becomes the defacto owner, responsible for giving the ship orders, providing fuel and livelihood and paying any fees associated with the vessel's employment, including port and canal fees, local taxes, wharfage and dockage charges.

Voyage Charter: A voyage charter is an agreement between owner and charterer to carry cargo between two or more points at an agreed upon price that is subject to certain covenants, all-inclusive. The two negotiate the vessel's arrival time at load port, the amount of cargo the vessel is to carry, the draft available to the vessel at load port and the rate at which the charterer will load the vessel and then discharge it upon arrival at destination, among other details.

In theory, the offer by an owner of a voyage charter should equate to what a charterer would pay if hiring the vessel on a time charter basis and executing the cargo. Otherwise, charterers will find a suitable vessel to time charter and handle the details and reduce their costs of transportation. In practice, though, the time charter represents a significant transfer of risk from the vessel owner to charterer, as opposed to the voyage charter.

The risks the charterer assumes with a time charter that can be avoided with a voyage charter include:

- Time lost to weather
- Vessel time spent at loading
- Vessel time spent at discharge
- Fuel costs
- Cargo loss, potentially cargo damage
- Legal risks as owner

Since the vessel is on a daily hire, any delays result in an increase in cost for the charterer.

If the charterer can control some of these risks better than the ship

owner, the time charter is a reasonable option. If load or discharge conditions are complicated (multiple load or multiple discharge berths and/or ports, for instance), the control of the vessel and the associated costs would enable the charterer to freight the cargo for less than if chartered on a voyage basis where he would have to secure options from the ship owner to accommodate the different variables.

There is no secret to identifying the difference between a time and voyage charter; the difference is in the risks. When the charterer can calculate those risks better than the owner, it will be evident in the difference in landed freight costs, and the choice for a time charter will be clear. It is important that the charterer have a detailed understanding of how to operate a vessel, including purchasing bunkers, appointing agents and handling port charges, before the charterer undertakes such a task.

There is nothing that says an importer has to charter one vessel or one voyage at a time. When that buyer has a predictable import program and feels ocean freight is undervalued, the buyer can book multiple voyage charters or a long-term time charter for a period in which the buyer can execute several voyages. Even if the charterer does not use the time period vessel against the charterer's needs, the charterer has secured price protection against an increase in ocean freight levels.

Multiple voyage charters satisfy the same purpose but liquidity is much more limited. A time chartered vessel can be sent to any number of destinations for any kind of bulk cargo. The voyage charter, by its nature, is very specific and more difficult to relet.

If the importer has no strong opinion about price direction or the size of the program that makes the importer's own needs a threat to liquidity, there is no rule against doing nothing about the importer's future freight needs

THE TIME CHARTER

Standard Charter Parties

Like much about the maritime trade, the standard time charter form or contract is old (1943), but it is used as a foundation by most participants. Nearly every ship owner and charterer has terms that they like to include in their negotiations. Many of these are included in a common rider that each party customizes to the party's view. Below are some of the major points in the time charter contract:

1. Description of the parties involved: the owner, the charterer and the name of the vessel. A detailed vessel description is usually attached to the rider but charters can be negotiated that allow for a generic vessel type, a specific vessel "to be nominated" or TBN.
2. Establishment of the amount of time the named vessel is under time charter.
3. Designation of the delivery point or range.
4. Stoppage of the time count if the vessel arrives at the initial load port and is not ready for loading.
5. Specifications that the owner will pay for all provisions, wages, insurance and regular maintenance.
6. Specifications that the charterer will pay all fuel costs and customary port charges.
7. Establishment of an amount, in dollars-per-day, that the charterer must pay the owner for the use of the ship, the payment schedule and the method exchange.
8. Establishment of return conditions, including where the owner regains control of the vessel after the time charter expires and with what notice it shall be done.
9. Specifications of the time frame in which the vessel has to be delivered from the owners to the charterer, for example, not before April 1 and not after April 20. If the vessel is not handed over on or before April 20, it is the charterer's option to cancel the time charter.

THE STANDARD VOYAGE FREIGHT CONTRACT

The standard form for a freight contract, or voyage charter, is called the Baltimore Berth Grain Charter Party or BFC. It too is an old contract form, initially written in 1913, but it is the basis of most grain charters from the United States. However, the BFC does not cover many of the details in today's more complicated charter parties. As can be seen from the sample in Appendix I, some language in the BFC has been eliminated or changed and a rider is attached with additional terms. The rider and the BFC form make up the complete charter party. Most of the recommended terms of the charter party are self-explanatory.

Non-Negotiable Terms:

1. Name of the parties entering into the contract and the vessel ("TBN" is acceptable but a negotiable term).
2. Type of commodity. For grain it will be HSS - Heavy grains/Soybeans/Sorghum; for light grains, such as barley, it is simply barley.

3. All cargoes must be loaded under the inspection of the National Cargo Bureau (NCB) in order to ensure proper and safe loading and stowage.
4. Payment of freight is made upon presentation of the signed bills of lading, which is made immediately upon completion of loading.
5. A vessel is considered load ready when it has been entered at the local customs house and has passed the NCB and FGIS inspections. When either the charterer or the charterer's agents are notified of the vessel's readiness to load (which must be before 1600 hours on a weekday or 1200 hours on a Saturday), the vessel's laytime begins the following morning at 0700 hours (see laydays - item two under negotiable terms).
6. A charter party can be cancelled by the charterer if the vessel has not been presented as load ready by 1200 hours on the last day of the shipment period. However, the charterer has to absorb the difference in the chartered rate and the replacement value - what the charterer has to pay for a vessel to replace the original charter. This can be either a loss or a gain.

NEGOTIABLE TERMS

Size of the Ship: This generally refers to the size of the cargo and the tolerances, but the actual deadweight size of the vessel can be negotiated too. It is critical to ensure that the charter party tolerances match the grain purchase contract tolerances. If the importer charters for a larger tolerance than the charterer has on the charter's FOB grain purchase, the charterer might be liable to the vessel owner for deadfreight. The tolerance on a charter party is the owner's option.

The charterer should try to obtain a small tolerance and if a specific vessel is being considered, it is even possible to charter a specific quantity - no more and no less. This would be expressed, for example, as 25,000 MT min/max.

Laydays: This specifies the time period in which the vessel must be ready to load the cargo. Typically, laydays are from 6 to 20 days. Narrower laydays are better for the charterer because the charterer will have greater control over the actual shipment period of the cargo. For example, if the laydays are April 20 to 30, the vessel must be ready to load no later than April 30. The earliest that time can start counting for the charterer is April 20, even if the vessel is ready five days early.

If the vessel is not ready to load on or before April 30, the charterer may cancel the charter party. There is, however, no recourse for the charterer if the market freight level is higher than when the charter party initially was fixed.

Commodity: This specifies the types of products that are loadable at the freight rate in the charter party. Different commodities will take up more space per metric ton than others. For instance, the specific weight of corn is greater than barley; therefore, it stows better, taking up less space.

In some charter parties, the charterer can convert from paying a freight rate per metric ton to making a lump sum payment. The "conversion" gives the charterer the right to load commodities not covered in the charter party, such as seeds.

Load/Discharge Ports: This stipulates how many load ports/berths and discharge ports/berths are included in the freight rate. Since more complicated load conditions - for example, three load ports compared to one - prolong the length of time the vessel is tied up in the charter, multiple port/berth options demand premium rates.

Typically, feed grains charters require only one berth at the loading point and one or two discharge ports/berths at the destination. Options for multiple discharge ports/berths at the destination are at a negotiated premium, declarable, for example, when the vessel completes loading.

From a freight standpoint, lifting a large cargo is more economical. Since the marginal cost of operating a 65,000 ton deadweight vessel is little different in these modern days than a 20,000 ton deadweight vessel. It is necessary for the charterer to combine as much cargo as is possible, putting different products, even destined for different discharge ports (within geographic reason), on the same vessel. In most cases, the premium for multiple load or discharge ports/berths will be much less than the savings from chartering the larger vessel.

Freight Rate: This is expressed in dollars per metric ton, or long ton. Also defined in the freight rate is who arranges and pays for the trimming of the cargo. A few definitions follow:

- FIOT: Free In/Out Trimmed - the charterer pays all of the trimming expenses.
- FIOST: Free In/Out Spout Trimmed - the charterer pays all of the trimming expenses except when special machine or

hand trimming is required.

- Gross Load - the vessel owner pays all of the trimming costs.

The most common way to charter in the feed grains trade is FIOST, since the vast majority of vessels used are self-trimming bulk carriers and only require spout trimming. Tween-deckers and tankers require special machine trimming and consequently cost the charterer extra trimming charges.

Demurrage/Despatch: Demurrage is the daily penalty rate the charterer pays the owner if the vessel has not been loaded within the time allowed in the charter party. Despatch is the daily rate the owner pays the charterer on the number of days/hours the vessel is loaded faster than the time allowed. To some extent, demurrage rates reflect the daily value of a vessel and will, over time, vary with the freight market. For example, a 50,000 MT vessel with a daily value of approximately 14,000 USD should reflect a demurrage rate of about 12,000 USD to 20,000 USD per day. When the freight markets are depressed, the demurrage rate could be only 8,000 USD to 9,000 USD. The standard despatch rate is half of the demurrage rate and gives the charterer the incentive to load the vessel as quickly as possible.

RIDERS

Riders are contract extension clauses which are attached to standard contracts. They may include the following provisions:

1. Clause 1 in the Baltimore Grain Charter Party (BFC) specifies all situations in which the vessel owner is not responsible for damage to the cargo. Therefore, often times a rider will include that marine insurance is required.
2. The rider will specify who is to appoint agents at the load and discharge ports. In either case, the owner pays all agent fees.
3. The BFC Saturday clause is used in all charters originating in the United States and specifies the conditions under which Saturdays may count as laydays. Saturdays ordinarily are not considered laydays unless stated as such in a rider.
4. The "lighterage" clause specifies the maximum weight the vessel is allowed to have at its destination. If the vessel is too heavy, the owner must pay the cost of lightening the vessel. If conditions have changed at discharge so the vessel cannot unload, it is the charterer's responsibility to pay for lightening the vessel.

5. The owner must pay for any securing and strapping of the cargo. Only natural separations are allowed; charterers pay for artificial separations.
6. Overtime is paid by whoever orders it - owners or charterers, unless ordered by the port, in which case the charterer pays for it.
7. The vessel cannot be loaded or discharged in Cuba, Libya or North Korea, and cannot enter into ports in those countries before or during the charter party.
8. Any dispute between the owner and charterer is to be settled by a three-person arbitration panel. Each party appoints one commercial arbitrator. Together, the parties and the arbitrators then appoint a third arbitrator. The three make a final decision.

A charterer generally appoints an agent to execute an FOB contract. The agent's responsibilities include the following:

Role of the Agent

1. With local authorities:
 - customs requirements
 - immigration
 - plant protection and quarantine (PPQ)
 - hold inspection
 - pilots, tugs, lines and so forth
 - U.S.C.G. (United States Coast Guard)
 - documentation
2. With owners:
 - bunkers
 - crew business
 - repairs
 - cargo
 - invoices and documentation
3. With charterers:
 - cargo
 - documentation
 - invoices

The following charges, including agents' fees, are normally paid for by the shipowner:

- pilots
- tugs
- lines

- customs
- immigration
- plant protection and quarantine (PPQ)
- inspection
- repairs
- bunkers
- tonnage tax

An important part of the agent's work is to discuss with the master of the ship specific issues of the cargo, such as the stow plan of the vessel, load rotation (when the vessel will go into berth) and expected cargo lift. The agent will also obtain the master's permission to sign bills of lading.

Sometimes two agents will be involved - one appointed by the charterer and one appointed by the owner to protect his interests. The owner's agent will be involved with the specific issues of the vessel owner, such as repairs, crew and bunkers.

One of the agent's most important jobs is to secure the documentation necessary to permit the cargo to be loaded onto the vessel. This documentation includes:

National Cargo Board (NCB) Loading Pass: When the vessel arrives at port, the first vessel inspection is by the NCB which studies the master's stow plan and inspects the vessel to ensure that the vessel is structurally safe to load. The NCB also checks the stability of the cargo based on the stow plan and judges if the stowage is safe for the voyage. If all is to the satisfaction of the NCB, it issues a pass allowing the vessel to load the cargo.

USDA Pass: After the NCB inspection, USDA inspects the cargo spaces for cleanliness. If the space is clean to the USDA's satisfaction, it issues a pass to the vessel's agent.

NOR (Notice of Readiness): After the vessel has passed the NCB and USDA inspections, it will tender its NOR to the charterer's agent and the agent will then file an application for berth with the loading elevator. This has to be done by 1600 hours on weekdays or 0900 hours on Saturdays, and time will commence for the charterer the following workday at 0700 hours. The agent passes the NOR to the loading elevator.

Final USDA Pass: As the cargo is being loaded, USDA (or its designated state inspectors) supervises the weighing and grading and issues weight and grade certificates for the completed cargo.

Mate's Receipt: As soon as loading is completed, the master of the ship issues a mate's receipt and signs it. The mate's receipt is a temporary title of ownership to the cargo given to the seller. The seller surrenders it to the agent who in turn issues the bill of lading (B/L). The charterer pays the freight cost against a release of a signed B/L.

Bills of Lading: While the cargo is being loaded on the vessel at the port elevator, the agent will draft bills of lading. The B/L specifies the amount of goods delivered to the ship, the parties involved, load port and destination, and the date of vessel completion. The B/L date determines the shipment date. As soon as the owner's agency confirms freight payment, the agent signs the B/L and releases it to the seller who in turn surrenders the mate's receipt.

In buying CNF or CIF, the buyer avoids all of the complications of chartering vessels, arranging logistics and executing an FOB purchase. The buyer only has to specify the shipment period and discharge terms; the seller arranges the rest. It is clearly an easier but not necessarily economical way to purchase grain.

Car Bulklers: These are designed to transport vehicles, but they can also transport grain in a way similar to a self-trimming bulk carrier. A car bulker might bring cars from Japan to the United States, remove the cars and load U.S. grain for the return trip to Japan.

Ship Types

Oil/Bulk/Ore Carriers (OBO): These are used to transport these three commodities. A special trimming cost would be incurred if an OBO transported grain. Before chartering a vessel, one should pay special attention to the type of cargo carried previously. For example, if the vessel carried oil, it might require special cleaning procedures.

Self-Trimming Bulk Carriers (STBC): These are the most commonly chartered vessels in the U.S. grain trade business. They are specially suited for grain transport because their bulkheads slope at an approximate 45-degree angle to the horizontal, preventing empty spaces from developing in the wings of the hold.

The self-trimming bulk carrier is the most economical vessel to charter because the holds are easy to clean and loading does not require special trimming, which would make stevedoring expensive.

Some vessels are referred to as PANAMAX type, which simply means the vessels can transit the Panama Canal. The term is typically reserved for bulk carriers in the 50,000-70,000 MT dead weight tonnage (DWT) range.

Tankers: As vessels designed to transport petroleum products, chemicals or other liquids, tankers are rarely used to transport grain because their design makes loading bulk grain difficult and expensive. The charter rate of a tanker would have to be at a substantial discount to that of a STBC to allow the charterer to recoup the costs.

Tween-deckers: These vessels are suited for loading general cargo, not necessarily grain. They have two decks which are separated, allowing for multiple products transport. The disadvantage is that loading and discharging a tween-decker takes longer and costs more than loading an STBC that is the same size.

Vessels are built under the supervision of a classification society which approves the builders' plans, supervises the actual construction and certifies the vessels. This extensive supervision is done for safety and insurance reasons. The most active class societies are Lloyds Register, London, United Kingdom; American Bureau of Shipping, New York City, USA; Norski Veritas, Oslo, Norway; Bureau Veritas, Paris, France. The societies also inspect the vessels annually.

SHIPPING AGENCIES AND SHIPPING BROKERS

Shipping agencies can be located in the *Transportation Telephone Tickler*, published annually by the Journal of Commerce, Inc. For more information, contact the Journal of Commerce at (973) 848-7082, or nmurray@joc.com.

For information regarding shipbrokers, the *Shipbrokers Register* provides a list of brokers in most countries. Orders can be placed to:

The Shipbrokers Register
P.O. Box 2
261-22 Landskrona, Sweden
Phone: 46-418-76660
FAX: 46-418-76667
Email: info@wramfeltmaritime.se
Website: www.shipbrokers-register.org

Risk Management in U.S. Grains Markets

In world feed grains markets there are risks that come in many shapes and sizes. This chapter will review the risks associated with the prices of feed grains for the consumer and producer and how these risks are managed. The use of futures, options, swaps, derivatives and cash commodities will all be examined to provide a thorough overview of risk management in the feed grains markets.

Today's risk management business was born out of necessity in Chicago in 1848. Feed grains produced in the Midwestern United States were subject to fluctuations in supply, demand, transportation, storage and price that created risks for both consumers and producers. Today, private and government buyers from around the world buy grain from the United States. The importers of feed grains need to be informed in order to overcome these same risks in the modern marketplace.

Grain importers need mechanisms that will help them discover the market price for a commodity when business decisions to buy and/or sell must be made. Once the market price is identified, they must find mechanisms to reduce the price risk between the time of the transaction and the actual delivery of the goods.

Here is an example of a feed grains importer who requires a mechanism to reduce price risks to operate his business:

A grain importer in Poland decides in July of 2004 that the grain importer will buy 100,000 bushels of U.S. corn for delivery the following March. Corn for March 2005 delivery is currently priced at \$2.75 per bushel (a bushel of corn is equal to 56 lbs. A metric ton is equal to approximately 2204.7 lbs. Therefore, one metric ton equals approximately 39.368 bushels of corn.). The importer enters into a contract stipulating that after the grain importer purchases the grain in March, the grain importer will resell it in that month to a Polish dairy

farmer as part of a mixed feed at a price calculated to yield the importer \$3.05 per bushel - \$2.75 for the importer's grain costs plus 20 cents for the importer's processing costs and another 10 cents for the importer's profit. However, by the time the importer pays for the grain to arrive in March 2005, the market price has risen to \$3.25 per bushel. The importer's total costs and profit have risen to \$3.55 per bushel while the importer's advance contract with the dairy farmer only nets the importer \$3.05 per bushel. Without any additional risk management efforts, this importer would lose 50 cents per bushel because of the price fluctuation between the time the commitment was made and the delivery period.

To control this price risk, grain buyers in the United States and other countries can use several tools to minimize market exposure. Price risk can be reduced by any single or combination of physical Cash Trading, Exchange Traded Futures, Exchange Traded Options, Over the Counter Swaps and Derivatives.

CASH TRADE

A cash forward contract can be an effective method of risk management for many feed grains market participants. The purchase or sale of the physical commodity in the cash market for delivery at a specified later date is the most common form of cash trade. A cash forward contract is distinguished from the other tools discussed in this chapter in that:

1. A buyer's obligation to accept the agreed amount of a commodity at the agreed place and time cannot be automatically cancelled by making an offsetting futures contract sale. The nature of a cash trade is unique to each deal. In certain instances, the trade partner will be willing to create an offsetting contract, but the individual nature of the trade does not allow the flexibility of a futures contract.
2. Cash forward contracts are not standardized as to terms and specifications. Prices in such contracts are made without the auction-style price discovery that takes place on a futures exchange.
3. Cash forward contracts are not subject to the rules or regulations of futures exchanges. More often than not, they are subject to trade rules governing the cash market participants with self regulation and arbitration.
4. A cash forward contract involves a direct contractual relationship between two identified, specific parties. In a futures contract, the buyer does not contract directly with a specific seller or vice versa; instead, each party deals with an exchange clearinghouse.

Depending on the liquidity of trade, the governing rules of trade and the availability of quality trading partners, the cash grain trading markets may be used as risk management tools. More often than not, the cash grain trading markets are used by buyers and sellers of feed grains along with the futures and options markets of U.S. futures exchanges.

Exchange Traded Futures

The first risk management tool grain producers and consumers may use to minimize risk is the Exchange Traded Futures contract. At futures exchanges such as the Chicago Board of Trade (CBOT), futures contracts are traded between market participants. A futures contract is an agreement to purchase or sell a commodity for delivery in the future at a price that is determined at initiation of the contract. This contract then obligates each party to fulfill its terms at the specified price by either the delivery of the standardized quantity and quality of the commodity, or by offset.

Because futures markets are standardized, sellers and buyers are able to exchange one contract for another and actually offset their obligation to deliver cash commodities (in the futures market, offset means taking a futures position opposite and equal to one's initial futures transaction. For example, buying a contract if previously one was sold).

A futures transaction, in exchange markets, serves several purposes. Because price is achieved through a continual auction between buyers and sellers, futures markets are the single most effective price discovery mechanism of the above tools. In addition to providing a discovery process for actual market values, the futures markets also perform economic functions. When commodity producers and end users reduce price risks by using a futures market, one of the results is that the cost of bearing the price risk is reduced or eliminated. This, in turn, reduces the costs of carrying inventory stocks or of contracting in advance with end users of grain products. A decline in inventory or contracting costs not only benefits merchants, processors and other business persons, it also benefits millions of food consumers by reducing the price of food products they buy.

Futures markets also help to perform the economic function of moderating wide swings between the extremes of surplus supplies (with coinciding low prices) and supply shortages (with coinciding high prices). The markets do this by keeping all participants in contact with the state of the supply and demand balance by way of price.

As shown, the overseas buyer of U.S. feed grains can make effective use of U.S. futures markets in the buyer's procurement strategies. This is true whether the buyer purchases feed grains at the FOB price at the loading port, or at the CNF or CIF price at the destination port. In either case, the buyer can effectively reduce the buyer's price risk exposure; take advantage of seasonal and/or other market factors to lock in grain costs at the most advantageous time; make systematic buying plans; and make it possible, by locking in the forward cost of a basic feed grain such as corn, to establish forward prices for value-added products such as meat, eggs or corn milling products. Because trends in commodity futures markets have broad international impact, merchants and grain consumers outside the United States can use futures to protect themselves even in cases where they operate in protected markets that impede free market pricing.

The fact that futures markets in the United States can be important to grain users in other countries means that a wide range of groups outside the United States can benefit from familiarity with the markets. Futures markets are growing in most developing nation and even in several of the emerging economies. Firms that buy U.S. grains obviously have a direct and immediate interest in the market, but so do the people who buy grain from importers for food or feed. Others, such as academics, economists, distribution and retailing concerns, also have an interest in the futures markets as they need to make sound analyses of future trends in food supplies and prices in their own industries.

Exchange Traded Options

At futures exchanges across the globe, another form of risk management has developed over the last 25 years. The Exchange Traded Option on a futures contract is a unilateral contract which gives the buyer the right to buy or sell a specified quantity of a commodity at a specific price within a specified period of time, regardless of the market price of that commodity. Exchange traded options actively trade at the futures exchanges in the United States and abroad and they are an integral part of many feed grain risk management programs.

Unlike the underlying futures contracts upon which they are based, options are "rights" to purchase or sell futures contracts at certain pre-determined prices at which the underlying futures are delivered. These options have dates which correspond with the underlying futures contract but do not necessarily, nor usually, expire at the same time as the futures contracts. Options trade for prices referred to as

premiums, which represent the market's valuation of those "rights." Option buyers are acquiring the rights to demand (a call) or deliver (a put) the underlying future at a pre-determined specific price within a stipulated time period. Option sellers, or writers, are incurring an obligation to provide that designated future in exchange for a premium or price that they believe represents the risk of that option being exercised. The premium is the market price of the option.

The market price of an option, or premium, is determined by two components: the intrinsic value of the option and the time value of the option. The intrinsic value equals the amount (if any) by which an option is in-the-money. In-the-money is defined by the difference between the current price of the future underlying the option, for example, December corn, and the strike price agreed to in the option contract. Strike price is the value at which buyer and seller have agreed to exchange the offsetting obligations to buy or sell the underlying futures contract, in this case, December corn.

For example, a \$3 strike price call would have an intrinsic value of \$1 if the price of the underlying instrument were trading at \$4. The owner of the call would exercise the option and obtain the underlying instrument at the \$3 strike price and sell it for \$4 in the futures market and pocket \$1. Out-of-the money options have no intrinsic value.

That does not mean they have no market value. The second component of option premium or price is called time value. If there is time remaining in the life of an option, there is a chance that the price of the underlying instrument will rally (for a call) and bring that call into-the-money or more into-the-money. That chance has value.

For feed grains consumers and producers, the most common use of options is as price insurance. For example, suppose a corn mill in Taiwan has a fixed price contract to supply corn processing products to its customers, and therefore the mill is short corn. The mill's corn buyer believes the corn market may go down or is bearish but does not want to end up with margins squeezed or even negative. The Taiwanese corn buyer would like to wait for the anticipated drop in prices. Using options, the buyer purchases some insurance against higher prices while waiting for corn prices to drop. Assuming the July 2004 corn market is trading at \$2.75, a call option to buy December corn at \$2.90 might be priced at 10 cents. The buyer decides to buy this out-of-the-money call for an insurance policy that protects the buyer against prices above \$2.90. The buyer's worst case price for corn will be \$3.00 ($\$2.90 + .10$). If the market drops below \$2.65, the buyer will be better off than had the buyer simply purchased a futures contract, or hedged.

Over the Counter Swaps

Options can be a multi-faceted risk management tool which can create opportunity and profit for feed grains buyers if used properly. An exchange traded option can minimize risk, while leaving open potential reward for risk managers in the feed grains market.

A new risk management tool available to the feed grains market participants is the Over the Counter or OTC Swap, Derivative and Trade Option market.

The Over the Counter market for swaps, derivatives and trade options has only recently been made available as a risk management tool for the feed grains markets. In the Futures Trade Practices Act of 1992, Congress ultimately gave the Commodity Futures Trading Commission (CFTC) broad exemptive authority to relieve swaps from the regulatory burdens of the Commodity Exchange Act (CEA). The CFTC has acted on this authority and exempted swap transactions for eligible swap participants. The language was made specifically broad enough to include many markets where swaps are not currently utilized, including agriculture. Prior to the CFTC relief, the prevailing legal opinion was that swaps were illegal under the CEA for agricultural markets.

A swap is a forward contract with the price typically fixed at inception against an underlying index or indices. Settlement can be agreed on the basis of the value of that index or those indices at any single point in the future, but is usually the basis of an average of values over a pre-determined period of time. A swap does not generally convey the right or obligation for physical delivery. Although swaps are not common to agriculture yet, they have come to dominate risk management in many other markets. The total nominal value in swaps of currency, equity and interest rate risk are many multiples of the size of the futures markets which underlie those instruments. With the recent authorization of agricultural swaps, this segment of feed grains risk management markets could soon grow to a significant size.

Swaps have several advantages over futures and cash contracts. The only limitation one has in creating a swap is imagination and the willingness of another party to accept the risk that is being bought or sold. It is the ultimate freestyle contract which may include customized terms, with individually tailored size and specifications. It may also hedge risks that are not currently covered by exchange or cash traded instruments.

An example of a swap would be a feed compounder that consumes 50,000 (corn equivalent) bushels per month and is looking for forward flat price coverage from the regional grain handler; however, due to the relative values of alternative feed grains (barley, sorghum), the feed compounder is unwilling to commit to corn which is currently the cheapest grain delivered to the feed compounder's plant. The feed compounder's counterpart at the regional grain handler may offer the feed compounder a swap which would establish a floating contract that would be cash settled to an index of the nearby CBOT corn future price over the next three months based upon an average of a month's settlement prices. A line of credit would be established between the two parties, which would serve as margin unless market price moves exceed the line of credit.

At the end of the three months, the average settlement prices compared to the price fixed at inception would determine whether the feed compounder or the regional grain handler are owed money to settle the swap. At this time, the feed compounder could make the decision to purchase the lowest cost feed mix and not have any cash or futures commitments to unwind. Buying the full quantity of futures might require tying up a large amount of capital in margin money. Buying the cash corn would require reselling or trying to unwind the trade with the regional grain handler and dealing with the logistical problems created therein.

The principal value of swaps is their ability to hedge previously unhedgeable risks. The above example used the CBOT corn futures contract as its price index. Swaps may also use indices as obscure as published values in trade journals or broker's quotes for settlement. They are ultimately flexible and therefore useful in managing risk.

Not all parties are eligible to use swaps as a risk management tool in the feed grains markets. The following legal guidelines exist for participation in the swap market in the United States:

- Corporations or other entities with total assets exceeding \$10 million or net worth exceeding \$1 million who are entering into swap transaction in conjunction with the conduct of their business.
- Broker-Dealers
- Futures Commission Merchants
- Individuals with total assets exceeding \$10 million.
- Employee benefit plans subject to ERISA with total assets exceeding \$10 million.

Derivatives

Derivatives are called such because they derive their value from another instrument. A broad definition would include products traded on established futures exchanges, both futures and options, as well as the swap products above. In general use, the term derivative is distinguished from other forms of risk management first according to whether their primary use is for shifting market risk and, second, in that they incorporate characteristics of two or more of the other tools we have already discussed.

An option is defined as an exchange of rights between market participants. Swaps are defined as forward contracts without physical delivery. A derivative is an instrument that exhibits characteristics of both but does not fall into either category. A derivative is a financial instrument which can be traded on or off an exchange. The price of the derivative is directly dependent upon the value of one or more underlying instruments or an agreed upon pricing index. Derivatives involve the trading of obligations or rights based on the underlying product, but do not directly transfer property. They are used to hedge risk or to exchange a floating rate of return for a fixed rate of return.

Like swaps, derivatives have the customization that allows them to hedge risks that exist but are unhedgeable on established exchange traded futures, options or cash markets.

Many of the derivatives that are used in the commodity markets are simply combinations of all the above risk management tools. For example, a fixed price swap of corn risk FOB U.S. Gulf ports with an option component would be a derivative instrument combining the many risk management tools that are detailed in this chapter.

Trade Options

A Trade Option is a combination of the derivative market and the cash market. Rather than requiring delivery of the physical commodity as in forward contracts, a trade option would allow cash traders to utilize the rights involved in exchange traded options in the cash markets. A trade option is generally an OTC contract between commercial interests which would give the buyer the right to purchase or deliver grain against a set price and time period.

Hedger: A hedger is an individual who wants to remove or reduce the risk of unforeseen price movements in the future by using a technique that shifts price risk to others. A hedger is typically a

Trade Partners

producer, processor, marketer, seller or buyer of the commodities the hedger trades on the futures exchanges. The hedger may be someone who wants to lock in the price the hedger will get at some future date for a product growing in the hedger's fields or stored in the warehouse, or the hedger may be someone who wants to lock in the price the hedger will have to pay at some future date for a commodity that will be used in the hedger's business. Thus, a farmer who is growing corn in July and wants to establish the price the farmer will get at harvest time in the fall could do so by selling a corn futures contract (and usually offsetting it by buying a contract before the delivery date). A cattle feeder who wants to establish in July the cost of corn needed to feed the cattle feeder's stock in December can do so by hedging - using the futures market in July to buy a futures contract and later offsetting it by selling a contract before the delivery date.

Speculator: A speculator buys or sells futures in anticipation of a profit when prices later go up (if the speculator buys) or down (if the speculator sells). A speculator is unlikely to be inclined to take or make delivery of the actual commodity because the speculator is not using the futures market in connection with the commercial use of the product. Speculators provide capital to the market with the hopes of achieving profits through the successful anticipation of price movements.

Futures Commission Merchant (FCM): An FCM is strictly defined as any individual, association, partnership, corporation or trust that solicits or accepts orders for the purchase or sale of any commodity for future delivery on or subject to the rules of any contract market and that accept payment from or extend credit to those whose orders are accepted. Loosely, an FCM is a commodity brokerage firm which is in the business of buying and selling futures either for its own account and/or for others, and which is a member of a futures exchange.

Introducing Broker (IB): Any person, other than a person registered as an "associated person" of a FCM, who is engaged in soliciting or in accepting orders for the purchase or sale of any commodity for future delivery on an exchange and does not accept any money, securities or property to margin, guarantee or secure any trades or contracts that result from those activities.

Commodity Pool Operator: Individuals or firms in businesses similar to investment trusts that solicit or accept funds, securities or property for the purpose of trading commodity futures contracts or commodity options.

Commodity Trading Advisor (CTA): Individuals or firms that issue analyses or reports concerning commodities in exchange for payment, including the advisability of trading in commodity futures or options.

Clearinghouse: Each U.S. commodity exchange has its own clearinghouse which matches each day's purchases and sales and keeps records of every transaction between exchange members. The clearinghouse stands between buyers and sellers and acts as the guarantor of each contract. Because of the way the clearinghouse system operates, futures buyers do not know who might be responsible for providing the commodity they have agreed to purchase, and sellers similarly do not know who might receive their commodity if they actually deliver it. This anonymity exists because the clearinghouse acts as the seller to each buyer and as the buyer to each seller. The clearinghouse also balances every customer's account at the end of each trading day. Membership in the clearinghouse is not limited to individual living persons as is exchange membership, but is also open to corporations and partnerships.

Hedging and Basis Trading

Hedging is used in the grain trade by people who want to remove or reduce the risk of unforeseen price movements in the future. This is done by shifting the price risk to speculators who are willing to take on a risk in hopes of making a profit. A hedger seeks to reduce risk in order to concentrate on making profits from the primary businesses of growing, processing, feeding or merchandising grain. Below are two brief illustrations of hedging:

The business person who wants protection against the possibility of being hurt by a rise in prices will buy a futures contract. Thus, this person takes what is called a long position in the futures market to counter the risk of what is called short position in the cash market (meaning the business person does not yet have the grain needed).

The business person who wants protection against the possibility of being hurt by a drop in prices will sell a futures contract. Thus, this person takes a short position in the futures market to counter the risk of a long position (meaning the business person already owns or is perhaps growing the commodity which will be sold later) in the cash market.

In each of these cases, the business person has reduced or eliminated risk largely because the cash and futures markets are usually influenced by the same basic factors. In the first example, the business person who bought a corn futures contract at \$2.50 when the

cash price for delivery in the same month was \$2.60 might find later that cash prices had risen to \$2.85 and the grain would cost 25 cents more than expected. But the future contract price might well have risen from the original \$2.50 to \$2.75, so the business person's 25 cent profit on the offsetting sale of the future contract would offset the 25 cent loss in the cash market, and the price change risk would have been fully covered. In the second example, a producer who was hurt by a 25 cent drop in the cash market could offset it by an equal profit if the futures market declined 25 cents after the producer had sold a futures contract.

The simplified hedging examples above are only a first step for effective grain market risk management. Commercial producers and consumers are also dealing with the time and location value of grain that creates the concept called "basis."

Basis simply is the difference at any given time between the cash price for a commodity delivered at a particular place and time and the futures price for any given contract month of the same commodity. For example, if a merchant finds on July 1 that the merchant can buy corn in the cash market for \$2.60 per bushel for November delivery while the December futures contract is selling at the same time for \$2.50, the basis that July day would be plus 10 cents, or "10 over the December corn futures" for November delivery. When the cash price is below the futures price, the basis is said to be negative; when above the futures price, the basis is said to be positive. Like the futures price, the basis is competitively determined by those trading grain, and the cash price is simply the residual of the futures price plus or minus the basis level.

Basis is important to the hedger because the hedger is trying to establish or maintain the cash price by using the futures price. Therefore, the predictability of the difference between the cash and futures markets, the basis, is very important to the hedger. The basis is also important to the commodity speculator trying to profit by anticipating movements in futures prices which must eventually bear resemblance to cash prices. By knowing the basis, the speculator can relate cash prices to futures prices.

The price discovery aspect of the futures markets, acting as a clearing place for all market information and providing a real market value for the goods traded, relies on two key elements of the cash and basis equations. The first element is the need for the cash price at a delivery point designated by the futures markets and the price of an expiring futures contract to be reasonably close, differing by approximately the amount of the delivery costs associated with transferring

ownership. The second element is the need for a close correlation between market prices at designated futures market delivery points and prices at other places within the marketplace. Without this correlation, it would be difficult to effectively hedge commodities sold at non-designated delivery points. All of the above is the core of basis theory. The individual components of the basis for grain, or the factors that account for the difference between the cash and futures prices at any given time, include the following:

- Time factors, such as the cost of storing grain between its purchase on a local cash market and the expiration of a futures contract, or the cost of interest on money needed to finance carrying grain between the cash purchase and the futures month.
- Costs attributable to insurance or the risk of owning a commodity to which one has title.
- Location factors, meaning the cost of transporting the commodity from its existing site to the delivery point designated by a futures market.
- Quality factors, including differences between the grade, protein, moisture and foreign material content of the cash grain and the quality levels specified in a futures contract.
- Supply and demand conditions at the time and place where the basis is being determined.

Basis theory seeks to explain the vagaries of the differences between the cash and futures markets. It also helps to explain the basic and constant correlation of the two markets. Because the production and consumption of grain is characterized by seasonal production and continuous use, the market must perform its economic function of encouraging storage and usage during times of surplus and discouraging storage and usage during shortages. Absolute price, the price difference or "spread" between months of contracts at futures exchanges, combines with the cash differentials called basis to fulfill this economic function.

Because of this correlation, basis theory holds that for grain deliverable on futures markets, the cash basis at an enduser point could not go above a level equal to the applicable futures price plus the transportation and delivery costs. Once the basis exceeds this level, traders would be encouraged to move stocks from the future delivery area to the end user point. Conversely, theory holds that the cash basis level could not fall below a level at which grain could be brought profitably to the end user location and shipped to an exchange city to be delivered against the futures.

From an export standpoint, the important basis levels that foreign buyers may want to closely monitor are those at export vessel locations: the Great Lakes ports, U.S. Atlantic ports (often referred to as USNH or U.S. North of Hatteras), U.S. Gulf ports and U.S. Pacific ports (often referred to as PNW or Pacific Northwest).

Buyers in many areas around the world will be particularly interested in basis traded at New Orleans, La. (often referred to as NOLA). New Orleans accounts for more than 50 percent of U.S. grain exports because of its year-round, ice-free climate and its accessibility to producing regions via barge, rail and truck.

Basis is the key to understanding cash commodities trading and the key element to understanding the link between the actual physical commodities and the futures, options and derivative markets that seek to express the price of the underlying commodities.

TRADING BASIS AND HEDGING CASH RISKS

When a business person actually intends to buy a commodity in the future and wants to protect against unforeseen increases in the cash price before the business person's purchase is made, the business person will typically buy a futures contract, thus establishing a long position. The business person also is said to be engaged in a "buying hedge" or a "long hedge." Traders will say that such a buyer is "short the basis." Short the basis simply means that while the business person intends to buy the physical commodity in the future, the business person does not yet own it and the business person's profit or loss can be affected by what happens to the basis. Thus, the business person is short the basis.

A buyer will normally enter into a buying hedge transaction if the buyer believes that the quoted basis for a cash forward contract is likely to weaken and the buyer can cover his needs by buying futures contracts. The buyer will then look to make an offsetting sale of the buyer's futures contracts and buy the cash grain at a later date when the basis premium is lower.

If an individual intends to sell a commodity at a later date, this individual typically will consider selling futures contracts in an effort to protect oneself against unforeseen price declines before the individual actually makes one's cash sale. In these cases, the seller is described as having a "short hedge." At the same time, the seller will be described as being "long the basis" because the seller currently owns a physical stock of grain but the seller's eventual profit or loss after the sale will be determined partly by what happens to the basis

until the time of the cash sale. A seller normally will enter a short hedge if the seller believes that the quoted basis for a cash forward contract is likely to strengthen and the seller can get a better net return by selling futures contracts. The seller will then look to make an offsetting purchase of the seller's futures contracts when the seller makes the seller's physical cash sale.

HEDGING EXAMPLES

Example 1: A producer's hedge

A producer plans to sell 500,000 bushels (approximately 12,700 MT) of corn at harvest time. On July 1, the cash price is \$3.00 per bushel and the December future is \$3.25. The producer hedges by selling 100 December future contracts, thereby establishing a short hedge. When harvest arrives, the producer is ready to take two final steps: the producer will close out the producer's hedge by purchasing 100 futures contracts to offset the producer's earlier sale of futures, and the producer will sell the producer's physical grain in the cash market. At this point, the producer finds the cash price has declined to \$2.50 and the December futures price has dropped to \$2.75. Thus, the producer has secured the net of \$3.00 per bushel that was available in July but has not made either a profit or a loss on the hedging operation itself. Here is how it worked: The producer lost 50 cents per bushel in the cash market when the producer made the producer's actual sale at \$2.50 instead of the \$3.00 that was available to the producer for October or November delivery back in July. However, that loss was offset by the profit of 50 cents per bushel on the producer's futures transaction as the producer closed out the producer's \$3.25 futures sale with an offsetting \$2.75 purchase.

The example is summarized in this chart:

Time	Cash	Futures
July 1	Cash price \$3.00/bu for Oct. or Nov.	\$3.25/bu farmer sells 500,000 bushels Dec.

Time	Delivery	Futures Contracts
Harvest (Oct-Nov)	Cash price \$2.50/bu	\$2.75/bu farmer buys 500,000 bushels Dec.
	Loss: -\$.50/bu	Contracts Gain: + \$.50/bu

The result of the above example can also be evaluated by another method: an analysis of changes in the basis. The basis on July 1 was -25 cents, meaning the cash price of \$3.00 was 25 cents below the

\$3.25 future which is referred to as 25 under December. When the hedge is completed at harvest, the basis is still 25 under because the cash price of \$2.50 is 25 cents below the future price of \$2.75. Since there is no net change in the basis, there is no gain or loss on the hedge.

This process is not totally risk-free. If the basis in the example had changed while the hedge was in effect, there would have been a net gain or loss on the hedge transaction.

In the above example, the producer used a short hedge by selling futures. Any short hedge will show a trading profit if the basis strengthens. If the basis moves from 25 under to only 15 under, such a change means that it has strengthened by 10 cents and the hedger reaps a 10 cent profit. Similarly the basis could weaken and cause a loss on the hedge transaction.

Example 2: A corn merchant's hedge

In March, a corn merchant plans to protect against a future price increase on corn the merchant will need later in the year.

Date	Cash	Futures	Basis
March 5	\$2.00	\$2.21	-\$.21
April 2	\$1.92	\$2.11	-\$.19
May 7	\$2.04	\$2.30	-\$.26
June 3	\$1.99	\$2.05	-\$.06

Assuming that this corn merchant hedges one contract for 5,000 bushels of corn on March 5 by going short the basis, this means that the corn merchant will buy a futures contract (establishing a long hedge) on March 5. The corn merchant will simultaneously sell an equal amount of cash grain. What will be the result if the hedge is closed out by an offsetting futures sale and a purchase of cash grain on June 3?

To answer the question is another chart:

Date	Cash	Futures
March 5	\$2.00 (sells cash)	\$2.21 (buys corn)
June 3	\$1.99 (buys cash)	\$2.05 (sells corn)

In this example, the merchant has gained 1 cent per bushel on the cash transactions, but has lost 16 cents on the futures transactions. Thus, the net result of the hedge is a loss of 15 cents per bushel or an overall loss of \$750, which is calculated on the basis of 15 cents multiplied by the contract size of 5,000 bushels. As noted earlier, a

long hedger profits when the basis weakens and loses when the basis strengthens. In this example, the basis went from -21 cents on March 5 to -6 cents on June 3. The basis strengthened and the hedger lost.

This example also raises the question grain merchants must consider: "What is the net price the merchant paid for the corn?" To get this answer, evaluate the change in the basis. The basis strengthened by 15 cents between March 5 and June 3. Since the merchant was "short the basis," the merchant lost money. The merchant actually paid \$2.15 per bushel for the merchant's corn: \$1.99 for the actual cash grain plus the merchant's 16 cent loss on the hedge, or a total of \$2.15.

Example 3: A foreign exchange hedge

An importer who has foreign exchange risks may also use the exchange traded futures or OTC swap market to reduce foreign exchange risks.

For example, a Japanese grain firm plans to buy one billion Japanese yen worth of grain from the United States in three months, but the firm anticipates that the U.S. dollar will strengthen during the coming three months. The yen is currently selling for .9500 and the three month futures are priced at .9501. The Japanese grain firm properly hedges against a possible strengthening of the dollar by selling three-month futures and then offsets (closes the hedge) when the yen cash or spot market is at .9360 and the yen futures are selling at .9350. What is the resulting profit or loss? (A futures quote in yen assumes an extra two zeroes: a quote of .9355 really means .009355 yen per dollar.)

	Cash(spot)	Futures
Firm owns Yen	.9500	.9501
Firm sells Yen	.9360	.9350

The Japanese grain firm loses .0140 on the cash transaction but gains .0151 on the futures. The net gain or basis difference results in a .000011 profit or \$11,000. The use of futures to lock in currency risk avoided a potentially volatile move of .0140 or \$140,000.

Example 4: Hedging as a tool of operations

Hedging can be used to meet the operating needs of a substantial livestock feed manufacturer in an overseas location. This example will look at a hypothetical firm in South Korea named Solar Feeds which supplies livestock and poultry feeds to Korean poultry producers and cattle feeders.

The purchasing manager of Solar Feeds has decided to offer its customers the right to forward contract their feed requirements at prices that will be fixed in individual negotiations. The company hopes that this option will expand market share and encourage livestock producers to lock in their feed costs for the coming year by Nov. 1. As the strategy proceeds, the following orders are made by Solar Feeds' customers for the spring delivery season:

March	100,000 MT
April	100,000 MT
May	100,000 MT
June	<u>50,000 MT</u>
	350,000 MT

In trying to manage the risks involved in such a large delivery program, Solar Feeds must consider all the risk management tools outlined in the previous part of this chapter. With 60 percent of their livestock feeds comprised of feed grains components, Solar Feeds must make some decisions regarding the risk around this shipping schedule.

The options available to Solar Feeds in the cash and futures market on Nov. 1 are as follows:

Corn Price on Nov. 1

Basis FOB to Cash CNF
U.S. Export Korea

Month Futures + Basis + Freight = CNF Port

March	\$104/MT	\$4/MT	\$25/MT	\$133/MT
April	\$106/MT	\$6/MT	\$25/MT	\$137/MT
May	\$106/MT	\$8/MT	\$25/MT	\$139/MT
June	\$107/MT	\$10/MT	\$25/MT	\$142/MT
July	\$107/MT			

For simplicity, these examples assume 1 MT of grain to be equal to 40 bushels, although it is actually closer to 39.368 bushels. The symbols CH, CK and CN stand for corn futures contracts, with the letter C representing the symbol for corn and the second letter representing the symbol for the contract maturity months of March (H), May (K) and July (N). A more complete explanation of futures contract symbols will be found later in this chapter.

The futures prices above are conversions of the \$2.60/bushel, \$2.65/bushel and \$2.675/bushel prices for the March, May and July futures, respectively. The April and May shipments are priced off the May future as the June shipment is priced off the July future.

It is assumed that the freight rate remains constant from the U.S. export port to South Korea for 30,000 MT vessels at \$25/MT.

In the example, the estimate of forward contracts for mixed feeds sold by Solar Feeds is a total of 350,000 MT for delivery from March through June. Also, Solar Feeds uses corn for 60 percent of its livestock feeds. Thus, the firm's corn commitment is 60,000 MT per month in March, April and May, and 30,000 MT in June.

Solar Feeds decides that the quoted basis premium (offer) for the purchase of cash corn for future delivery (a cash forward contract) is likely to decline. On the basis of that decision, the firm believes that it can cover its corn needs by buying futures. Thus, Solar Feeds buys futures contracts and delays the purchase of physical stocks in the cash markets until the basis premium is lower. In this example, Solar Feeds is using a long or buying hedge strategy which means that it is going short the basis by purchasing futures contracts.

Acting on its decision to use a buying hedge, Solar Feeds buys the following futures contracts on Nov. 1 at the following prices:

March - The firm buys 480 March corn contracts at \$2.60 per bushel to cover its 60,000 MT corn commitment. (The 60,000 MT commitment equals 2.4 million bushels. Since each contract covers 5,000 bushels, 480 contracts will be needed to match the 2.4 million bushel commitment.)

April and May - The firm buys 960 May corn contracts at \$2.65 per bushel to cover its commitment to make feed sales during April and May. (Solar Feeds needs 60,000 MT in April and a further 60,000 MT in May. Since there is no April futures contract for corn, the firm must buy 960 May contracts instead of purchasing 480 contracts in each of the two months.)

June – Solar Feeds buys 240 July corn contracts at \$2.675 per bushel. The firm needs only 240 contracts to cover 30,000 MT of corn for June. Since there is no June contract for corn, the hedgers must cover the June need by buying 240 July contracts.

The net result of this activity is that by purchasing corn futures contracts - 480 March, 960 May, 240 July – Solar Feeds has

effectively acted at the beginning of November to hedge its forward energy feed ingredient commitments which amount to 210,000 MT of corn. By the end of the following January, the firm decides to end its hedge and acquire the physical corn it will need in the coming months. Therefore, Solar Feeds decides on Feb. 1 to buy cash corn and sell futures contracts. When this decision is made, the market prices Solar Feeds confronted the previous November have changed. As of Feb. 1, the market prices look like this:

Corn Price on February 1

Basis FOB to Cash CNF
U.S. Export Korea

Month Futures + Basis + Freight = CNF Port

Month	Futures	Basis	Freight	CNF Port
March	\$107/MT	\$2/MT	\$25/MT	\$134/MT
April	\$109/MT	\$4/MT	\$25/MT	\$138/MT
May	\$109/MT	\$6/MT	\$25/MT	\$140/MT
June	\$110/MT	\$6/MT	\$25/MT	\$141/MT
July	\$110/MT			

As seen below, the net results of the hedging strategy between Nov. 1 and Feb. 1 gave Solar Feeds a less risky approach to the feed grains import markets and even earned a hedging profit due to basis gains during these three months.

Month	Cash	Futures	Net	Shipment Size	Profit
Mar	\$1.00/mt	\$3/MT	\$2/MT	60,000MT	\$120,000
Apr	\$1.00/mt	\$3/MT	\$2/MT	60,000MT	\$120,000
May	\$1.00/mt	\$3/MT	\$2/MT	60,000MT	\$120,000
June	\$1.00/mt	\$3/MT	\$4/MT	30,000MT	\$120,000

So the net profit as seen above with Cash, Futures and Shipment Size of the shipments taken into consideration on Solar Feed's strategy was \$480,000. It is very important to note that the figures used in explaining the trading strategy of Solar Feeds show that there was a change in the basis during the period covered by this example. Moreover, the gain the firm generated by using a long hedge (buying the futures against cash sales) was the direct result of the basis change. Following is a look at the basis changes that took place:

Basis

Month	NOV 1	FEB 1	Difference
March	\$4/MT	\$2/MT	-\$2
April	\$6/MT	\$4/MT	-\$2
May	\$8/MT	\$6/MT	-\$2
June	\$10/MT	\$6/MT	-\$4

(Note: In this example of trading by Solar Feeds, we based calculations on the assumption that freight charges from a U.S. export port to South Korea would be \$25 per MT throughout the time period covered by the example. To simplify the example, a fixed freight rate was used instead of the shifting rates that would most likely be encountered in real trading. For the same reason, marine insurance, stowing and trimming, fumigation, separations, interests and other costs associated with a particular transaction and shipment were omitted. Freight is a significant cost component in grain procurement and is covered in depth in Chapter 5.)

Summary of Hedging and Basis Trading

One point to remember with the Solar Feeds example and the others is how prices and price changes show how the market can work but which do not necessarily indicate how the market actually will work at any given time. In the actual world, the same kind of price trends, changes and results could happen as it did in the Solar Feeds example, but not typically.

The Solar Feeds example used the cash and exchange traded futures market to achieve a reduction in risk and a trading profit from the hedging process. Using the other instruments of risk management, a feed grains user may be able to achieve very similar or even superior results limiting risk depending on the market environment. Exchange traded options, over the counter swaps and derivatives and trade options all could be applied in the Solar Feeds example with differing risk profiles.

The market situation is necessarily typical. The price trends used in the example show a basis that appears high in October when the approach of the harvest season often can narrow the basis, and it appears lower in February when it might be falling under different conditions.

Any combination of cash and futures prices like those chosen for the Solar Feeds scenario must be based on a particular combination of supply and demand situations. The example, as given, shows good results from Nov. 1 to Feb. 1. However, in a "real world" situation like this, there could be a temporary interim appearance of large losses in the futures position. Volatile markets could mean that, for a time, a hedger would be facing expensive margin calls (addressed later in this chapter). The example shows a significant amount of profits generated by the futures component of the hedge. The same profit scenario could be realized in a case where gains are solely attributed to a weakening of the basis. Remember, the long hedger would still profit with a weaker basis, but the hedger would face immediate losses in the form of margin calls for the long futures position.

All of this means that if our hypothetical South Korean firm is going to hedge against the risks of price changes, it will have to accept a second risk - the risk of changes in the basis. Before taking that necessary second risk, executives of the firm will have to be convinced in November, when their buying program begins, that the cash basis will weaken by February. Such a conviction must be founded on an expert study of the market and also on the firm's ability to ride out interim margin calls if they occur. As far as the underlying risk of price changes is concerned, this is reduced by the hedging operations use of futures contracts.

RISK REDUCTION TECHNIQUES

In addition to hedging and trading the basis values in the cash market, there are many other forms of using the tools described above to limit or enhance risk in the feed grains markets. Two examples of risk reduction techniques are the study and trade of spreads and directional positions. Without understanding the flow of prices and real value of any given futures month, risk management is virtually impossible. One must attempt to at least stay abreast of inputs to the overall direction of the market and of individual spreads within the market to truly reduce risk.

Conventional long or short hedges carried out by buying or selling commodity futures contracts, swaps or options are not the only tools available to the grain industry for reducing price risks. There is also the technique called a "spread." Spreads refer to the price difference between grain markets, or between a given market's delivery periods or futures months, or between commodities.

Inter-delivery spreads: One way to spread a market in futures is to simultaneously buy a futures contract representing one delivery period and sell one of the same commodities representing another delivery period. A spreader in this instance would be making an estimate on the relative value of the futures' delivery periods. Inter-delivery spreads are used throughout the agribusiness community for several different reasons, but their main attraction is the way they can help reduce price risks.

Commodity-price spreads: This type of spread is most often used by soybean crushers who process soybeans into meal and oil products. The operation involves either selling or buying a given contract month on soybeans and the simultaneous buying or selling in the same month of contracts on soybean products, namely soybean meal and soybean oil.

Inter-commodity spreads in cash markets: These can be used at times because some commodities can be substituted for one another, and the more readily the substitutions can be made, the closer the price relationship or correlation of the commodities. For example, corn and sorghum can both be used as animal feed ingredients. Sorghum is normally priced below corn. If the corn-sorghum price gap widens because of an increase in corn prices or a decline in sorghum prices, a trader will anticipate that feeders may increase their usage of the relatively cheaper sorghum and may decrease their usage of the relatively expensive corn. This reaction by the feed industry would result in an increase in the price of sorghum and a decrease in the price of corn. A trader then could buy sorghum in the cash market and simultaneously sell corn futures because the trader expects a narrowing spread between the two commodities.

As in the case of inter-delivery spreads, the trader using an inter-commodity spread is concerned with the changing price gap between two commodities, not their absolute values. The trader sometimes may decide that the spread appears abnormal and the trader expects that it will return to a normal level. Or the trader may feel that while the current spread is normal, it is likely to become abnormal. If the trader can correctly predict whether the difference will widen or narrow, the trader will make money by trading spreads.

Inter-market cash grain spreads: These are based on the fact that some commodities are traded on more than one market. Where prices for a commodity vary between markets, the variations are usually due to differences in transportation costs and/or to the fact that different grades of the commodity are deliverable. A trader will make an inter-market spread when the trader believes that the price differences

between two markets look abnormal. For example, if the price of corn in one market is excessively high when compared to the price on another market considering the logistical and quality differences, a trader will sell corn on the expensive market and buy on the relatively cheaper market. The trader will profit if the market returns to normal and narrows.

Directional trading: Often directional trading is viewed as the realm of speculators trying to predict market direction and purchasing or selling futures contracts in order to profit from the changes. Opportunities exist in the markets to predict price movement for several reasons. Because feed grains markets are relatively free, prices fluctuate with changes in supply and demand. The reason for trends in price changes is that when changes in supply and demand appear on the economic horizon, the market for those goods begins to move from price X to price Y in order to either decrease demand or increase supply or vice versa. If the market is efficient, and the change in supply or demand real, the reward for recognizing that trend will be money made taking the risk as the markets move.

Being aware of these price changes and their causes is a key element to risk management in the feed grains markets.

There are two common methods of analyzing commodity market conditions: fundamental analysis and technical analysis. Business persons whose operations are affected by what happens in the grain production and marketing system should understand both methods.

Market Analysis

FUNDAMENTAL ANALYSIS

Fundamental analysis is a basic method of seeking answers to questions about what is happening in commodity markets. Fundamental analysis is really a study of basic, underlying factors which will affect the supply and demand of a commodity.

Since both supply and demand for agricultural commodities are relatively inelastic in the short run, prices of these commodities tend to be volatile. If an analyst can project probable future shifts in supply and demand and compare them with past shifts, the analyst can begin to project prices and price trends. Government agencies in the United States and other countries forecast worldwide supply and demand, but the analysis of the flow of grain across the globe is performed by many parties, both private and public, and both informed and uninformed. Price changes in the market reflect the expectations of these many different market participants rather than

hard facts which are usually not available until months after actual supply and demand development.

A fundamental analyst will look at a wide range of supply and demand factors that determine the price outlook for any individual commodity. Some of these include weather conditions, harvest estimates, commodity stocks, user demand, supply of related or substitutable commodities and transportation conditions for commodities. Other factors may include a wide range of political and economic developments, such as government policies and support programs, interest and currency exchange rates, and the world political situation and its potential impact on trade decisions.

The fundamental analyst typically uses raw data collected from the global news and market reports and runs econometric models and statistical comparisons to evaluate the objective state of the supply and demand of a commodity. Although this analysis, if thorough enough and conducted with correct data, can lead to profitable market insights, fundamental analysis can be a dangerous tool if used incorrectly.

Some faults cited by traders and economists in the use of fundamental analysis are as follows:

- Drawing hard fast trading rules from fundamental analysis and forgetting the imperfect nature of any information.
- Allowing expected conclusions to lead to the evidence, i.e., confusing or misdirecting the analysis with market beliefs.
- Viewing fundamentals in a vacuum, without regard to technical analysis or risk management.
- Using out-dated information or using information not available to the rest of the market which, therefore, has no immediate impact.
- Ignoring seasonal considerations.
- Forgetting that commodity markets can exceed costs of production or go significantly below the cost of production for extended periods of time.
- Ignoring the state of the futures markets or the fundamentals of money flow.

In sum, fundamental analysis is an effective tool in managing risks in commodities trading. By definition, it is the study of all factors affecting the forces of supply and demand on a commodity.

TECHNICAL ANALYSIS

Technical analysis is a method of seeking to predict future price movements on the basis of past movements. It is an approach to forecasting commodity prices which examines patterns of price change, rates of change and changes in volume of trading and open interest, without regard to underlying fundamental factors. Many academic experts have questioned the value of technical analysis. However, since the charts of past price movements used by technical analysts also are used by most traders to predict price movements in futures markets, any risk manager in the commodity markets must be prepared to understand both technical and fundamental analysis. Such an understanding is needed to give the trader a full appreciation of all forces shaping the decisions of major participants in the futures markets.

Because commodities are an integral part of our economy, and because they have offered volatile price movements in the past, many speculators are involved in the markets that did not exist just 10 years ago. Commodity Pool Operators and their trading advisors, Commodity Trading Advisors (both described earlier in this chapter), have added increased importance to the area of technical analysis and its interpretation of price direction. Money flows with the direction of price for many technical traders and money flows with price momentum. The single hope of a speculator is to capture movement and, therefore, money in the analysis and trading of markets. Technical analysis is an effective tool when used with fundamental analysis to manage feed grains risk along with other commodity price risk.

Several examples of basic technical analysis are included in the next few pages. Some are chart patterns and others include measurements of trend and direction which allow traders to visualize changes in market behavior.

Head and Shoulders Formation: This formation, as illustrated in the example at right, portrays a rising market that has peaked, reversed its direction and is declining.

Inverted Head and Shoulders Formation: The same pattern only appearing at the bottom of a price move and forecasting a reversal in price trend. Technical analysts believe that this pattern signals a change in trend and the beginning of an up move.

Support Area or Trend Lines: A support line or area is the point below which prices have not dropped during recent past declines. A

support line indicates that there is an "auction" of sorts occurring and buyers are following the price up while sellers are raising their selling ideas or running out of supply. When prices approach an area of support or a trend line, traders may take this as a signal that it is a good time to buy because markets may rebound to levels above the trend line. However, once broken, the auction process may be over and technical analysts may interpret this as a bearish signal for traders. Prices may then fall because the imbalance has changed and traders who are long will try to liquidate their positions. When the market breaks downward through a support area, technical analysts say it has exited a trading range and is trying to find price stability at a new lower level. At right is a graph showing a support area and trend line.

This graph illustrates a basic chart formation depicting the area or line below which futures prices have not dropped during recent times. Prices are being bid up along this support line as buyers are willing to chase price up and sellers take advantage of higher prices or are running out of the commodity.

MOVING AVERAGES

A moving average is literally an average of some number of recent days trade in a commodity futures market. Traders use the moving average of prices to observe the direction of price movement and reversals of price movement. This is easily the most common form of technical analysis and the foundation for a school of technical analysis called trend following. Below is an example of a price chart with several short, intermediate and longer term moving averages.

When listing futures contracts prices and options prices, quote vendors use ticker symbols, or shortened codes representing the futures or options markets, along with the traded prices in code. Often that code consists of one or two letters to indicate a specific contract, and then a letter to indicate which month the futures contract represents, and finally a number to indicate the year of the futures contract. Other codes do not use numbers but rather an additional letter of the alphabet to represent futures contracts of the same month but differing years.

The following is a list of futures contract specifications and a list of symbols for expiration months:

Futures or Options Delivery Months:

<u>Current Year</u>	<u>Month</u>	<u>Next Year</u>
F	JANUARY	A
G	FEBRUARY	B
H	MARCH	C
J	APRIL	D
K	MAY	E
M	JUNE	I
N	JULY	L
Q	AUGUST	O
U	SEPTEMBER	P
V	OCTOBER	R
X	NOVEMBER	S
Z	DECEMBER	T

Options on the futures traded at all of the exchanges are listed using the same symbols and month codes, along with specific codes representing the strike price and whether it is a call or a put.

Chicago Board of Trade Agricultural Futures:

Contract/Symbol	Contract	Size	Months
Corn/C	5,000	Bushels	H,K,N,U,Z
Soybean/S	5,000	Bushels	F,H,K,N,Q,U,X
Wheat/W	5,000	Bushels	H,K,N,U,Z
Soybean Oil/BO	60,000	Pounds	F,H,K,N,Q,U,V,Z
Soybean Meal/SM	100	Tons	F,H,K,N,Q,U,V,Z
Oat Futures/O	5,000	Bushels	H,K,N,U,Z

Chicago Mercantile Exchange Agricultural Futures:

Feeder Cattle/FC	50,000	Pounds	F,H,J,K,Q,U,V,X
Live Cattle/LC	40,000	Pounds	G,J,M,Q,V,Z
Pork Bellies/PB	40,000	Pounds	G,H,K,N,Q
Lean Hogs/LH	40,000	Pounds	G,J,M,N,Q,V,Z

(1 pound = .4534 kilograms)

Other U.S. Agricultural Futures:

Cotton - New York Cotton Exchange /CT
Orange Juice – NYCE/JO
Coffee - Coffee Sugar and Cocoa Exchange/KC
Cocoa - CSCE/CC
Wheat - Minneapolis Board of Trade/MW
Wheat - Kansas City Board of Trade/KW
Sugar – CSCE/SB

Although there are agricultural futures contracts traded outside U.S. exchanges, the Malaysian palm oil market and the European soft futures markets (i.e., coffee, cocoa and sugar), the non-U.S. agricultural futures markets are relatively illiquid and under traded.

Non-Exchange Traded Agricultural Markets: To trade off-exchange in the cash markets or OTC swap or derivative markets, participants must meet the many credit and customer requirements that individual banks and trading firms impose on their clients, along with the CFTC required limits on the minimum size of participants in the OTC markets. If a feed grains market participant believes that it meets these requirements, the easiest way to contact participants in the non-exchange traded markets is via trade contacts in the cash markets or via brokers within the cash or futures markets.

FUTURES MARKET ORDERS

When a trader wants to buy or sell futures, the trader gives an order to the commodity futures trading representative who handles the trader's account. The orders must be written and entered without any ambiguity as to price or quantity to ensure that they are properly handled on the trading floor. The representative executes the order and administers the account. Orders to buy or sell can take varying forms depending on the needs of the individual buyer or seller. The following types of orders are used in the execution of futures trading:

Market Order: The most common order that a futures buyer or seller uses is the market order. In a market order, the customer states the number of contracts of a given delivery month the customer wishes to buy or sell and the customer does not specify the price. The customer wants the trade made immediately at the best available price. An order may specify "buy 10 July corn futures contracts at the market." This directs the trading representative on the futures market floor to buy 10 July corn contracts at the lowest price being offered at the time that the order enters the trading pit. "Sell five December corn futures at the market" is a directive to sell five December corn futures

at the highest bid available at the time the order is entered into the trading pit.

Limit Order: A limit order has a price limit at which it must be executed. When a customer gives the customer's broker a limit order, the customer sets the maximum price that the customer is willing to pay when purchasing, or a minimum price that the customer is willing to accept when selling. "Buy 20 December corn contracts at \$2.50" means to purchase at \$2.50 or lower. The advantage of a limit order is that the customer knows the worst price the customer will receive if the customer's order is executed. The disadvantage of a limit order is that the customer's order might not be filled.

Stop Order: A stop order is really a delayed market order which cannot be activated for trading until some specified development occurs. Stop orders are usually used to liquidate previously entered transactions. For example, "buy 10 December corn contracts at \$3.00 stop" means to buy at any price (a market order) AFTER another trade occurs at \$3.00 or higher. Buy-stop orders are always pegged to prices above the current market. "Sell 10 corn contracts at \$2.80 stop" means to sell at any price (a market order) but not UNTIL another trade occurs at \$2.80 or lower. Sell-stop orders are always below the market.

A stop order is activated, triggered or elected once the indicated price is reached. Stop orders can also be activated even if there is no actual trade at the stop price. A buy-stop order is triggered by a bid at the stop order price - a sell-stop order by an offer at the stop order price. Stop orders are also called "contingent orders" because they depend on the occurrence of a specified price change.

Stop orders also can be used to establish positions or enter the market. Stop orders are often used as defensive devices to protect profits and restrict losses.

Good-Til-Cancelled Order: A good-til-cancelled order is open until it is either cancelled or executed. It is also called an open order.

These are just some of the more common orders used by market participants. Others exist and it is usually up to the individual futures commission merchant and exchange as to what kinds of orders are accepted.

MARGINS

All futures buyers or sellers must post deposits called margins with the brokers handling their accounts. These deposits are not the same as margins in stock markets where the deposits act as down payments on stocks. Instead, futures margins act as performance bonds to help guarantee the buyer or seller will meet the buyer's or seller's obligations - both deposit margin funds.

When a trader buys or sells a futures contract, the trader must post an initial margin with the precise amount set by the rules of the exchange on which the trade is made. Later, the trader will be subject to what are called maintenance margin requirements which will be lower than the initial requirement.

If the value of a customer's account goes below the initial requirement, the customer will not be obligated immediately to deposit additional margin. But if the value of the account falls below the level tied to the maintenance requirement, the customer will get a "margin call," meaning the customer will be called upon to deposit additional funds with the customer's broker to bring the customer's margin back up to the initial requirement level. For example, suppose the initial margin on a trade is \$1,000 and the maintenance margin set by the rules of a particular exchange for that trade is \$800. Then suppose the value of the futures contract held by the trader falls to a level that is only high enough to provide \$810 worth of margin guarantee. Nothing happens because the trader has not fallen through the maintenance margin level. But if the contract value declines further and is only high enough to provide \$790 worth of margin guarantee, the customer will get a margin call for \$210 - enough to bring the customer back to the initial \$1,000 margin level.

Margin requirements for spread trades are below those for hedgers and speculators because price movements between two futures contracts usually are less volatile than fluctuations in other forms of trading. Margins serve to act as performance bonds for all trading at U.S. futures exchanges. They are managed by clearing firms and commission merchants and their customers to facilitate trade and manage the credit risk inherent in all futures trading.

FUTURES ACCOUNTS AND TRADING PROCEDURES

Before a commodity futures trading firm opens an account for a customer, the firm needs to obtain the following from a customer:

- A signed risk-disclosure statement is necessary for every customer, whether the customer is a hedger or a speculator. By signing the statement, the customer acknowledges that trading in futures entails the risk of the customer's entire investment and more.
- Information including employment, financial status and bank credit references.
- A signed customer's agreement in which the customer agrees that the customer will abide by the rules of the futures exchanges and be responsible for margin calls. This agreement provides that a customer's account can be closed out if the customer fails to respond to a call for additional margin deposits.
- A copy of the charter and bylaws of any corporation or investment company seeking to set up a commodity trading account, and proof that the corporation or company is legally entitled to engage in futures trading.

Individuals and firms entering the futures markets to hedge their risks on grain imported from the United States - or for any other reason - should also note the following facts about the handling of commodity futures trading accounts:

Erroneous reports about the execution of a futures contract order do not nullify the trade, and the customer must accept what actually happened if the trade was in accordance with the terms of the customer's order. However, if a floor broker makes a trade outside a limit price set in advance by the customer, the floor broker is personally responsible for the difference. For example, if a customer ordered a corn contract sold at not less than \$2.75 and the broker sold it for \$2.73, the broker would be liable for the 2 cent difference.

A customer should commit to futures trading only as much money as the customer is willing to risk or able to lose.

At the discretion of the commodity futures brokerage firm handling a customer's account, a customer may trade during a day without a margin for each separate transaction, provided that the net position resulting from the day's trading is fully margined. The brokerage firm will retain the right to ask for more margin money during the day.

DAILY LIMITS ON PRICE MOVEMENT

The commodity futures exchanges set limits on the amount by which any commodity future can rise or fall in one day. These limits are set to help maintain the ability of the markets to provide effective price

discovery and risk-transfer functions. The basic price-change limits include 20 cents per bushel daily for corn, 30 cents for wheat and 50 cents for soybeans. These limits can be changed when exchanges determine that the changes are needed. In fact, the Chicago Board of Trade's current policy is to increase the limit for a three-day period if the basic limit is reached in a single day.

DELIVERING COMMODITIES UNDER FUTURE CONTRACTS

Typically less than 3 percent of all futures contracts are executed by actually making or taking grain deliveries according to the Chicago Board of Trade. However, the option of making an actual delivery at the end of any contract period must be preserved to maintain the economic relationship between cash and futures prices. That relationship is maintained by the fact that during the delivery period, the cash and futures prices should become virtually identical for a specific commodity at a specific delivery point. This process is called convergence and ensures that the futures reflects the value of the underlying commodity. When the actual physical deliveries are made to close out futures contracts, traders must comply with a number of rules including:

- The buyer must make full payment to the seller before 1300 hours on the date of the delivery.
- The price the buyer pays when the buyer accepts delivery under a grain futures contract is the settlement price on the day before the day that the buyer takes delivery. This is the futures contract price adjusted by allowance for superior or inferior grades. The profit or loss is settled with the buyer via the clearinghouse or broker. Delivery of a specific grade may be at a premium or at a discount from the contract grade.
- Each delivery notice is followed by issuance of a delivery document - a warehouse receipt, shipping certificate or bills of lading.
- On delivery of a commodity, the seller has the right to choose the place and time of delivery from options available under exchange contract rules.

GUIDE TO FUTURES EXCHANGES

Established U.S. futures exchanges include the following:

- Chicago Board of Trade (CBOT), founded 1848.
- Chicago Mercantile Exchange (CME), founded 1874.
- International Monetary Market (IMM), established 1972. The IMM is a division of the CME.
- New York Coffee, Sugar and Cocoa Exchange, founded 1882.
- Commodity Exchange (COMEX) in New York, founded 1868.
- Kansas City Board of Trade, founded 1856.
- Mid-America Commodity Exchange in Chicago, founded 1868.
- Minneapolis Grain Exchange, founded 1881.
- New York Cotton Exchange, founded 1870.
- New York Futures Exchange, founded 1979.
- New York Mercantile Exchange, founded 1872.

Each exchange specializes in its own contracts. All of the exchanges are constantly developing new risk management tools which compete for trading business with the other exchanges and the off-exchange markets.

All of the above exchanges are regulated under a system that provides several layers of protection for persons who use the markets. The integrity of trade on the exchanges is supported by the clearing corporations that stand behind all transactions. The exchanges are also constantly monitoring their own activity through self regulation. Market firms, their performance and employees are all monitored by the commodity futures exchange, and also by an industry group, the National Futures Association. Another layer of protection is provided under U.S. law by a regulatory agency of the U.S. government, the Commodity Futures Trading Commission (CFTC). All exchanges have written rules regarding conduct of members, membership, trading practices, position limits and price movements. These rules vary among exchanges and are also developing constantly as innovation continues in the marketplace. Those who wish to trade on any exchange should consult that exchange's constitution and rules for specific details.

For further information on the futures markets, contact:

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Commodities Futures Trading Commission (CFTC)
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1155 21st Street, NW
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Financing U.S. Grains Imports

International grain transactions present both the exporter and importer with a variety of risks that must be handled and minimized to better facilitate the transaction.

A major business risk to the importer is the performance of the exporter - will the grain purchased meet the contract quality and quantity specifications, and will the grain be shipped on time? The exporter also faces a similar performance risk - will the importer provide the proper shipment mode in a timely manner (in case of an FOB transaction), and/or will the goods be discharged quickly (in a CNF transaction) without problems arising from political upheaval or changing import regulations?

However, arguably the greatest risk the exporter faces is the payment risk. This risk can surface in many forms -the importer's non-acceptance of the grain at destination due to quality complaints, or the importer's default due to changing market conditions or lack of foreign exchange. The larger the payment risk is to the exporter, the greater the risk "premium" the importer will pay as part of his purchase price.

The payment risk is handled with a number of different payment options, each reflecting varying levels of payment risk control. This chapter will help the importer to identify the various payment options, specify when and why a payment option is used, explain how each payment method operates and identify the advantages and disadvantages each payment option presents the importer.

The most commonly used method of payment for international grain transactions is the letter of credit, a method that comes with a range of options. In addition, this chapter will look at open account transactions, the cash against documents payment form, the barter (countertrade) method and other lesser used payment options.

Letter of Credit

A contract between an importer and an exporter may call for payment under a letter of credit, often abbreviated as L/C or LC. A letter of credit is a written commitment by a bank to make payment at sight of a defined amount of money to a beneficiary (exporter) according to the terms and conditions specified by the importer (applicant). The letter of credit should set a time limit for completion and specify which documents are needed to confirm the transaction's fulfillment.

More properly called a documentary letter of credit, it is important to remember that a letter of credit is an additional contract dealing with credit between the applicant (importer) and the issuing bank and is separate from the original grain contract.

Proper letters of credit have the following basic components:

Applicant: The party applying for the letter of credit, usually the importer in a grain transaction.

The Issuing Bank: The bank that issues the letter of credit and assumes the obligation to make payment to the beneficiary, usually the exporter.

Beneficiary: The party in whose favor the letter of credit is issued, usually the exporter in a grain transaction.

Amount: The sum of money, usually expressed as a maximum amount, of the credit defined in a specific currency.

Terms: The requirements, including documents that must be met for the collection of the credit.

Expiry: The final date for the beneficiary to present against the credit.

These are the necessary components of any letter of credit for the credit to become a valid, operable instrument. In addition, letters of credit come in various forms that define their level of risk. A revocable letter of credit allows the issuing bank (at the applicant's request) to amend or cancel the credit at any time without the approval of the exporter (beneficiary) and is the most risky form. In contrast, an irrevocable letter of credit has terms and conditions that cannot be amended or changed without the expressed consent of all parties, the issuing bank, the exporter (beneficiary) and the importer (applicant). Finally, the addition of a commitment by a bank other

than the issuing bank to irrevocably honor the payment of the credit, provided the exporter meets the terms and conditions of the credit, results in a confirmed irrevocable letter of credit.

HOW DOES A LETTER OF CREDIT WORK?

Once the exporter and importer have concluded a transaction that calls for payment under some form of letter of credit, the importer makes an application for the credit to the bank, either locally or in another country, that will issue the credit.

The importer/applicant will give the issuing bank instructions that cover such items as:

- The full, correct name, address and contact information of the beneficiary, usually the exporter.
- A brief description of the grain involved, including the quantity, quality and unit price.
- The method, place and form of shipment, the location of the final destination and other shipping issues including transshipment, partial shipment and the latest shipping date.
- The full, correct description of the documents required, including the period of time after the documents are issued within which they must be presented for payment. In addition, the credit should specify if payment is to be immediate (at sight) or with some degree of deferment (i.e., four days after acceptance).
- Details of the letter of credit itself, including the amount (usually expressed as a maximum), the expiry date, how the credit will be made available and the transferability of the credit.
- The type of credit, the revocable credit, the irrevocable credit or the confirmed irrevocable letter of credit.

Upon the issuing bank's approval of the credit application, the letter of credit is usually advised to the exporter; that is, the bank makes the exporter (beneficiary) aware that a letter of credit is opened.

The advising is often done by a bank other than the issuing bank, and this second bank may also confirm the credit. Once the importer and exporter are satisfied that the credit is operable, the exporter ships against the original grain contract and presents the required documents and a draft (the instrument by which the exporter directs

the importer to make payment) to the confirming, correspondent or issuing bank, as the case may be. Upon checking the documents for accuracy, the bank(s) passes the documents onto the importer and makes payment against the draft to the exporter.

WHAT ARE THE ADVANTAGES/DISADVANTAGES OF LETTERS OF CREDIT?

The confirmed, irrevocable documentary letter of credit payable at sight is the most commonly used type of letter of credit in international grain transactions. This credit presents the exporter with the least risk. Generally, the importer bears the cost of opening the letter of credit. The cost of confirming the letter of credit is an item of negotiation in the original grain contract. As risk and cost are inversely related, letters of credit present the importer with the highest cost payment option. In addition, the existence of a letter of credit does not obligate the exporter to ship the grain purchased by the importer. However, due to the substitution of a first-class commercial bank's credit for that of the importer's, the exporter's payment risk premium is greatly reduced and the resulting price to the importer usually reflects no risk premium.

Payment Against Documents

Under payment against documents, the exporter instructs his bank through a collection letter to forward a draft and the original shipping documents to the importer's bank for payment. The collection letter contains complete and precise payment instructions to be followed by the importer's bank, including the timing of the release of the shipping documents.

The release of the documents is either on a cash against documents (cad) basis or on a documents against acceptance (d/a) basis. Payment under a cad arrangement is at sight, while payment under a d/a arrangement utilizes a time draft.

HOW DOES PAYMENT AGAINST DOCUMENTS WORK?

Under the original grain contract, the exporter makes shipment and sends the shipping documents to the exporter's bank for collection. The exporter's bank then sends the shipping documents, along with a collection letter, to the importer's bank, which then sends a collection notice to the importer. The importer either makes payment upon receiving the notice at sight and prior to possessing the shipping documents; makes a cash against documents

arrangement; or the importer accepts a time draft obligating the importer to pay at a future date (a documents against acceptance arrangement). Only after payment or acceptance does the importer receive the original shipping documents.

WHAT ARE THE ADVANTAGES/DISADVANTAGES OF PAYMENT AGAINST DOCUMENTS?

The major advantage of the use of a cash against documents payment is the low cost, versus using a letter of credit. Also, the exporter can receive full payment prior to releasing control of the documents, although this is offset by the risk that the importer will for some reason reject the documents (or they will not be in order). Since the grain cargo would already be loaded (to generate the documents), the exporter has little recourse against the importer in cases of non-payment. A payment against documents arrangement involves a high level of trust between the exporter and the importer and should only be entered into between parties well-known to each other.

The oldest method of payment in international trade is the countertrade arrangement. The term covers a wide range of business arrangements where payment is received in forms other than cash.

Countertrade

The various types of business arrangements commonly called countertrade and used in the international grain trade can be divided into the following categories: barter, counterpurchase and compensation.

WHEN AND WHY IS COUNTERTRADE USED?

The use of countertrade arrangements by importers has increased recently, due in part to poor demand for some countries' large amounts of base commodities, the lack of or inconvertibility of local currencies and/or a desire to help stimulate or comply with regulations of importing countries' economies. Countertrade is most often used by importers operating in a planned economy.

Also, countertrade arrangements are complex, usually involving three or more separate contracts or protocols, often necessitating parties other than the importer and exporter, and call for additional payment and finance terms as part of the transaction. Great care should be exercised when utilizing a countertrade arrangement.

WHAT FORMS OF COUNTERTRADE EXIST? WHAT ARE THE ADVANTAGES/DISADVANTAGES OF EACH FORM?

Barter: This oldest form of countertrade involves the direct exchange of goods having equal or offsetting value with no exchange of cash between the two parties involved, the importer and the exporter. Barter is transaction specific and handled under one contract that calls for an exchange of specified goods - without assigning a value to them - within a short time period. The exchange of goods takes place directly between importer and exporter without the need for a third party, such as a bank.

The use of barter involves considerable risk to the exporter and the importer as goods are shipped and documents exchanged directly, often with one party executing an obligation prior to the other party taking an action. This risk can be reduced by the posting of standby bank letters of guarantee on behalf of the parties. While barter can be potentially advantageous to the importer, as the importer receives the commodity without any outlay of foreign exchange, not all exporters find the risk acceptable or have the expertise to handle the goods received from the importer.

Counterpurchase: This most frequently used form of countertrade involves the use of two separate contracts - the commodity sales contract between the exporter and the importer, and a separate, although technically related, contract between the importer and the exporter that obligates the exporter to buy a defined value of goods (or services) from the importer's country over a fixed time period. As opposed to barter, counterpurchase arrangements call for each transaction to be independent of the other. Thus, an exporter would ship grain to the importer and invoice for the commodity under a normal letter of credit, while the exporter might then arrange to handle a cargo of the importer country's goods, such as coffee, under a separate commitment to pay, thus satisfying the counterpurchase obligation. This may involve the need for a third party, such as the coffee exporter, in addition to the use of one or more commercial banks.

Since a counterpurchase arrangement is really two trade contracts, each with their own payment terms, instead of a single, standard grain contract, this form of countertrade is quite cumbersome and the transaction may not be completed for a period of months or years. An additional disadvantage is the need for the importer to utilize foreign exchange, although this is offset with the revenue

from the counterpurchase. Although it is cumbersome, counterpurchase trade appeals to many importing countries as a means of assuring a more positive trade balance, and many countries require its use in some form.

Compensation: This final type of countertrade involves payment for the imported commodity by the buyback of a resultant or related product. For example, an importer would pay for a shipment of corn with a previously agreed upon amount of compound feed. Like counterpurchase, compensation arrangements involve two separate, independent contracts and are usually tied to a long-term industrial development or facility. Once again, payment by the importer to the exporter normally is handled under a letter of credit or similar method.

While compensation has many of the same advantages and disadvantages as counterpurchase, compensation arrangements can help favorably influence a lending institution to provide financing for the establishment of a proposed industrial complex by providing the importer with a steady source of supply and a fixed buyer of output.

Other Payment Methods

Consignment: Under this method of payment, an exporter usually ships and stores grain in a bonded warehouse in the importer's country. While the commodity is consigned to the importer, the exporter retains title to the goods until local sales are made. Often under consignment arrangements, a private or government bonded warehouse company or commercial bank serves as "custodian" of the goods and handles the administrative details. As this type of payment arrangement involves a great deal of administrative and managerial time and effort, while also presenting the exporter with a high level of payment risk, most exporters enter into a consignment sale only with an overseas subsidiary, joint venture company or an importer very well-known to the exporter.

Open Account: While this payment term involves the fewest restrictions and the lowest cost for the importer, it also presents the exporter with the highest degree of payment risk and is only employed between an importer and an exporter who have a long-term relationship involving a great level of mutual trust. Upon shipment under the original export grain contract (usually on FOB terms), the exporter prepares the normal documents, such as bills of lading and original invoices, as well as weight and grade certificates. The exporter presents these to the importer directly, thus avoiding

the involvement of a commercial bank. The importer then pays the exporter directly, usually via wire transfer, upon receipt of the documents. Under an open account payment method, title to the grain passes from the exporter to the importer prior to payment and subjects the exporter to default risk. Furthermore, there is a time delay in payment, depending on how quickly documents are exchanged between exporter and importer.

Cash in Advance: This payment method is virtually the opposite of the open account option. The importer, after purchasing the commodity under the original grain contract, sends the exporter a cash advance or prepayment for either the entire shipment or a portion of the shipment. The exporter, upon receipt of the cash advance, makes shipment to the importer and provides all the necessary shipping documents. While this method of payment involves direct importer/exporter contact without direct commercial bank involvement and is therefore inexpensive, the importer faces a very high degree of payment risk under a cash in advance payment, while retaining little recourse against the exporter for poor quality goods or incorrect or incomplete documentation.

Finance Options and Methods

In the simplest grain import transaction, the importer would purchase from the exporter the grain desired and, upon shipment of the cargo, would immediately make cash payment in full. However, some importers want (or need) to make payment at a later date or over an extended period. It is at these times that the importer needs to understand the various financing options available.

Just as the various options explored in the payment section present the exporter and importer with various levels of payment risk and ways to manage this risk, the different financing methods also address the risks presented by payment at a deferred time. The U.S. government, in recognition of the need to minimize payment risks to exporters and to facilitate grain exports, established the export credit guarantee program, commonly known as GSM-102, and the related intermediate export credit guarantee program, or GSM-103. These two programs - funded at over five billion U.S. dollars per year - are the major source of U.S. grain trade financing.

The confirmed irrevocable documentary letter of credit payable at sight is the most commonly used payment instrument. It is also the foundation for some common forms of import financing. This section analyzes various financing options, including the time of acceptance and deferred payment letters of credit, and the use of discounting and refinancing forms of financing grain imports.

GSM Financing

The U.S. government, understanding the need to provide credit financing to expand agricultural U.S. export markets, established the GSM-102 and GSM-103 programs. The GSM-102 program provides credit guarantees for three months to three years, while the GSM-103 program provides credit for three to ten years. The programs are designed to provide an exporter (or a party assigned by the exporter) a payment guarantee while supplying an importer with the necessary credit terms to make the purchase, and provide for the payment of 98 percent of the covered value and a certain portion of the interest in case of payment default.

These programs are administered by the U.S. Department of Agriculture's (USDA) Commodity Credit Corporation (CCC). Importing countries are generally chosen to participate in the programs where the need for credit to establish or maintain a market is necessary and, most importantly, where the countries' financial conditions allow for a reasonable expectation that payments against the credits will occur. Bulk commodities, such as feed grains, account for the greatest amount of financing dollars.

HOW DO GSM PROGRAMS WORK?

Country allocations, stated in a set dollar amount and commodity specific, are established annually through negotiation between a foreign government and the U.S. government, usually through USDA. The allocations are available to use for eligible export sales during the U.S. government fiscal year, which runs from October 1 to the following September 30. While contracts must be signed by September 30 of the fiscal year in which the allocation is made, shipment may occur up to December 31 for the previous fiscal year program.

With an allocation in place, an importer wishing to utilize the programs should then check, either with an exporter, a commercial bank or through the USDA directly, as to whether the allocation is operable. A late payment of a previous export credit guarantee commitment may temporarily suspend the current allocation. While many of the importers working with GSM-102/GSM-103 are actually government branches or trade entities, the importing country's private sector can participate under the program, and interested parties should check with their own government for any restrictions, as the credits are repaid in U.S. dollars, which creates a foreign exchange obligation.

USDA encourages the participation of private sector importers in these programs. However, in many instances, USDA will not make allocations to a country unless the central bank of that country makes assurances that the U.S. dollar obligation will be covered in the form of a Credit Guarantee Assurance (CGA). A CGA is an agreement which stipulates that if a foreign bank defaults on its payments under the GSM programs, the government of the foreign country guarantees to repay the obligation to the U.S. government. If a CGA is agreed to by a foreign government, it is then up to that government to decide how it will allocate the use of the credits among eligible importers in that particular country.

In other instances, USDA may not require a CGA. In these cases, individual foreign banks are analyzed and specific credit limits are set for each bank. Foreign importers can then negotiate directly with these approved banks or other banks within that country that have commercial relationships with the approved bank or banks for access to the GSM credit guarantees.

Assuming the credit is operable, the exporter and importer negotiate the original grain contract and the exporter's price includes the cost of the export credit guarantee fee called the premium. The original grain contract must call for payment under an irrevocable letter of credit. In addition, the credit guarantee will usually only cover the port value (FOB portion) of the transaction. A Cost and Freight (CNF) contract utilizing GSM-102/GSM-103 for the commodity will need to provide for two different payment terms, one for the FOB value of the commodity and one for the ocean freight. The premium schedule for the guarantee fee is based on the length of time the credit is needed and based on the interest rates for U.S. government debt obligations. The premium is equivalent to approximately one-third of 1 percent per year on the outstanding coverage for GSM-102. The premiums are higher for GSM-103 due to the longer credit periods. The GSM-102 premium is calculated based on a minimum of three months of coverage.

With a contract negotiated, the exporter will register the sale and submit the guarantee fee to the Commodity Credit Corporation (CCC). The CCC will evaluate the exporter's application and upon approval, will send the exporter a payment guarantee letter. The exporter usually then assigns the payment guarantee letter to a U.S. financial institution, almost always a U.S. commercial bank. By assigning the guarantee to a bank, the exporter reduces payment risk to the same level as an irrevocable letter of credit payable at sight, and CCC accepts the credit risk of the eligible foreign bank. A U.S. commercial bank - if not the issuing bank - provides the importer's

issuing bank and the importer credit for the amount not covered by the export guarantee, which is usually 2 percent. The exporter receives payment for the grain upon shipment of the commodity and presentation of the required documentation, and the U.S. commercial bank receives payment from the importer's local bank (or often the central bank) according to an agreed upon schedule, secure in the knowledge the U.S. government has assumed the great majority of the repayment risk.

If the importer wants to open the letter of credit with a bank located in the importer's country, the local bank must be approved by the USDA to participate in the programs. A list of approved banks can be obtained from the USDA, a U.S. embassy agricultural or commercial officer or from most exporters.

While the fee for the export guarantee is included in the price the importer will pay for the grain, the importer must also remember that other costs are incurred, such as letter of credit opening fees, confirmation fees, and most importantly, the cost of credit and fees charged by the issuing bank and the U.S. financial institution advising or confirming the letter of credit.

With the letter of credit issued by the importer's bank and advised to the exporter by the U.S. commercial bank to which the exporter assigns the payment guarantee letter, the exporter proceeds to ship the grain and present the necessary documents to the U.S. commercial bank for negotiation. In addition, the exporter must submit to USDA within 30 days of shipment, a statement of export and a revised payment schedule. The U.S. commercial bank passes the documents on to the importer through the importer's bank. The importer makes payments to the importer's bank, according to the scheduled agreement, covering the principal and interest of the credit, and the importer's bank makes payment to the U.S. commercial bank as per their scheduled arrangement. Principal and interest are usually paid by routine bank transfers to the U.S. bank that finances the transaction at the rates and intervals defined in the letter of credit or the financing agreement between the U.S. bank and the foreign bank. CCC requires that the total accrued interest be paid at each principal due date. Principal must be paid at least annually. In most cases, principal is paid semi-annually, with interest payments occurring at the same time. The U.S. bank providing the financing may require that interest be paid at more frequent intervals than principal. The interest rate is negotiated between the U.S. bank and the foreign bank. In almost all cases, the interest rate is based on a premium to the London interbank offer rate (LIBOR). Occasionally, the U.S. prime rate is used to establish

the base rate, with a spread negotiated to establish the effective rate. Both the LIBOR and the U.S. prime rates float. It is permissible under the GSM program for interest rates to be adjusted at periodic intervals based on changes in the LIBOR or prime rate if these adjustments have also been agreed to by the U.S. and foreign banks. It should be noted, however, that the interest negotiated between the U.S. bank and the foreign bank is totally separate from the interest rate and other terms negotiated between the foreign bank and the importer. If the importer is going to repay the local bank in local currency, then it is most likely that prevailing trade financing rates will be incurred by the importer which may or may not be correlated with LIBOR or U.S. prime rates. However, if the importer is repaying the local bank in U.S. dollars (and, in effect, bearing all exchange rate risks), it is useful to know current LIBOR and U.S. prime rates when negotiating the terms and conditions of the financing with a local bank.

There is no penalty for early repayments. Therefore, even shorter credit periods may be possible if the U.S. and foreign banks agree to early repayments. The minimum guarantee fee remains the three month fee and no refunds will be made by CCC when the banks agree to early repayment.

WHAT ARE THE ADVANTAGES/DISADVANTAGES OF EXPORT GUARANTEE PROGRAMS?

The use of the GSM-102/GSM-103 financing programs is more costly to the importer than a contract calling for a sight letter of credit payment due to the number of parties involved and the need for a guarantee fee. In addition, the fact that the credit is denominated in U.S. dollars and covers an extended period of up to 10 years, presents the importer or the importer's bank with increased foreign exchange risk. Although many program users are government entities that can handle this exposure, private sector importers can seek to cover foreign exchange risk through a local bank or commercial institution specializing in foreign exchange hedging.

These few disadvantages are minimal compared to the benefits these programs provide the importer. The GSM-102/GSM-103 programs provide very competitive financing terms at a minimal cost to importers who may not be able to import U.S. grains without the credit facilities.

It should also be noted that as countries around the world privatize their grain distribution systems and more trade will be occurring between private agents and/or end users, the U.S. government credit programs are adapting to meet these changes and reflect the needs of private importers. Decreasing the minimum guarantee term to three months, and approval of additional banks within many countries to increase competition for the financing component, are just two changes seen recently which add to the value of the program for the importer. Also, other changes will be occurring in the near future which will add further flexibility and benefits to these important programs.

OTHER U.S.GOVERNMENT PROGRAMS

Export-Import Bank of the United States:

The Export-Import Bank of the United States (EXIMBANK) also offers programs which may be utilized for U.S. agricultural commodity exports. Most of these programs are insurance policies which the exporter or the U.S. bank takes on to reduce their financial exposure. This coverage protects against both political and commercial risk and may cover either single or multiple shipments under the same contract. EXIMBANK also occasionally offers credits or credit guarantees to selected countries or regions. Most exporters will know which EXIMBANK programs could potentially apply to a given situation and should be utilized as a resource when investigating financing options.

THE TIME OF ACCEPTANCE LETTER OF CREDIT

Letter of Credit Financing

The time of acceptance letter of credit is similar to a sight letter of credit except that the importer agrees with the exporter to pay for the grain at some future date, usually a term of 180 days or less. The exporter, as beneficiary of the letter of credit, may present a draft drawn from his bank or other negotiating bank and discount the proceeds; that is, receive immediate payment less some fee that the bank charges for the time value of money and the payment credit risk.

HOW DOES THE TIME OF ACCEPTANCE LETTER OF CREDIT WORK?

An importer/exporter follows the same steps as in the letter of credit payment. The importer's bank opens a letter of credit at the request of the importer. The importer's bank informs the exporter's bank of the credit. The exporter's bank advises the exporter of the credit. Shipment occurs, and the documents are presented to the exporter's bank. These are documents that include a draft calling for payment at the agreed date - a time draft. Assuming the documents are in order, the exporter's bank may add its acceptance to the time draft and discount the time draft, making payment to the exporter. The importer's bank then receives the documents and releases them to the importer, who makes payment for the grain on the agreed date.

WHAT ARE THE ADVANTAGES/DISADVANTAGES OF THE TIME OF ACCEPTANCE LETTER OF CREDIT?

An importer involved in the processing of feed grains finds this form of financing advantageous, as it allows the importer the time necessary to process and/or market the resulting products and use the funds generated to pay the exporter. Additionally, the exporter may be able to make sales to importers otherwise not possible without the financing arrangement. However, these benefits must be weighed against the premium the exporter may build into the exporter's price representing the cost of discounting the draft.

THE DEFERRED PAYMENT LETTER OF CREDIT

A deferred payment letter of credit differs from a time of acceptance letter of credit in two very important ways. First, the deferred letter of credit is for a longer time period, usually up to 360 days. Second, this type of financing does not provide the exporter with the ability to discount the draft since the exporter cannot present the draft until the future date specified in the letter of credit.

HOW DOES THE DEFERRED PAYMENT LETTER OF CREDIT WORK?

The deferred payment letter of credit operates just like a sight letter of credit payment with the only procedural difference being that the exporter receives the payment from his bank at the agreed upon future date.

WHAT ARE THE ADVANTAGES/DISADVANTAGES OF THE DEFERRED PAYMENT LETTER OF CREDIT?

While providing the importer with a longer time period in which to make payment for the grain, the cost of this financing method reflected by the exporter as a premium included in the contract price can be great and alternative financing methods, like the GSM-102 program, might prove less expensive.

DISCOUNTING AND REFINANCING FINANCE OPTIONS

Financing the importation of feed grains can occur by methods that do not involve a letter of credit. The exporter may agree to accept terms with the importer using an open account arrangement with the additional stipulation of payment at a future date, creating a receivable for the exporter. Similar to the time of acceptance letter of credit, the exporter can then discount the draft with a bank willing to accept the receivable and the inherent credit risk. The discounting can occur on a non-recourse basis, where the exporter accepts no responsibility for repayment, or on a recourse basis, where the discounting bank can make a claim against the exporter in the event the importer does not pay. While this method allows the exporter to receive immediate payment for the feed grain, the payment risk to the exporter (or to the discounting bank in the case of non-recourse discounting) is very high and may cause the exporter to include a large risk premium in the exporter's price.

Finally, there are a variety of conditions under which the importer's bank may agree to refinance. The importer may have a revolving credit arrangement used to finance inventories, for example. While simply another form of draft or receivable discounting, the payment risk is normally transferred from the exporter to the exporter's bank.

CCC SUPPLIER CREDIT GUARANTEE PROGRAM

The U.S. Department of Agriculture administers export credit guarantee programs for commercial financing of U.S. agricultural exports. These USDA Commodity Credit Corporation (CCC) programs encourage exports to buyers in countries where credit is necessary to maintain or increase U.S. sales, but where financing may not be available without CCC guarantees.

Under the Supplier Credit Guarantee Program (SCGP), CCC guarantees a portion of payments due from importers under short-term financing (up to 180 days) that exporters have extended directly to the importers for the purchase of U.S. agricultural products. These direct credits must be secured by promissory notes signed by the importers.

CCC does not provide financing but guarantees payment due from the importer. A substantially smaller portion of the value of exports (currently 65 percent) is guaranteed under the SCGP than under the Export Credit Guarantee Program (GSM-102), where CCC is guaranteeing foreign bank obligations. Program announcements provide information on specific country and commodity allocations, length of credit periods, the required form of promissory note, and other program information and requirements.

The Foreign Agricultural Service (FAS) administers the SCGP. Regulations for this program are found in 7 CFR 1493, Subpart D.

Eligible Countries or Regions: Interested parties, including U.S. exporters and foreign buyers, may request that CCC establish a program for a country or region. Prior to approval, CCC evaluates the ability of each country to service CCC-guaranteed debt.

Eligible Commodities: The SCGP targets specific U.S. agricultural products, with an emphasis on high-value products and market potential.

Participation: CCC must qualify exporters for participation before accepting guarantee applications. Exporters who have previously qualified under the Export Credit Guarantee Program (GSM-102) or the Intermediate Export Credit Guarantee Program (GSM-103) are automatically eligible. New program applicants must have a business office in the United States and must not be debarred or suspended from participating in any U.S. government programs.

The exporter negotiates the terms of the export credit sale with the importer. Once a firm sale exists, the qualified U.S. exporter must apply for a payment guarantee before the date of export. The exporter pays a fee for the guarantee calculated on the guaranteed portion of the value of the export sale.

Financing: The importer must issue a dollar-denominated promissory note in favor of the U.S. exporter. The note must be in the form specified in the applicable country or regional program announcement. The U.S. exporter may negotiate an arrangement to

be paid, in full or in part, by assigning to a U.S. financial institution the right to proceeds that may become payable under CCC's guarantee. Under this arrangement, the exporter would also provide transaction-related documents required by the financial institution, including a copy of the export report which must also be submitted to CCC.

Defaults/Claims: If an importer fails to make any payment as agreed, the exporter or assignee must submit a notice of default to CCC. A claim for loss may also be filed, and CCC will promptly pay claims found to be in good order unless CCC determines that the guaranteed portion of the port value exceeds the prevailing U.S. market value of the commodity or product exported.

For audit purposes, the U.S. exporter must obtain documentation showing that the commodity arrived in the eligible country and must maintain all transaction documents for 5 years after payments are completed.

FACILITY GUARANTEE PROGRAM

The U.S. Department of Agriculture's Facility Guarantee Program (FGP) is designed to expand sales of U.S. agricultural products to emerging markets where the demand for such products may be constrained due to inadequate storage, processing, or handling capabilities. The program provides payment guarantees to facilitate the financing of manufactured goods and services exported from the United States to improve or establish agriculture-related facilities in emerging markets.

The FGP, a USDA Commodity Credit Corporation (CCC) program, is administered by the Foreign Agricultural Service (FAS). FGP regulations are a subpart of the Export Credit Guarantee Program (GSM-102) and the Intermediate Export Credit Guarantee Program (GSM-103) regulations (7 CFR Part 1493).

Qualified Projects: The Secretary of Agriculture must determine that the project will primarily promote the export of U.S. agricultural commodities or products to emerging markets.

Emerging Market: An emerging market is a country that the Secretary of Agriculture determines (1) is taking steps toward a market-oriented economy through the food, agriculture, or rural business sectors; and (2) has the potential to provide a viable and significant market for U.S. agricultural commodities or products.

U.S. Content: Only U.S. goods and services are eligible under the program. CCC will consider projects only where the combined value of the foreign components in U.S. goods and services approved by CCC represents less than 50 percent of the eligible sales transaction.

Initial Payment: An initial payment representing at least 15 percent of the value of the sales transaction must be provided by the importer to the exporter.

Payment Terms: Payment terms may range from 1 to 10 years, with semi-annual installments on principal and interest.

Payment Mechanism: Payment must be made to the exporter in U.S. dollars on deferred payment terms under an irrevocable foreign bank letter of credit.

Coverage: CCC determines the rate of coverage (currently 95 percent) that will apply to the value of the transaction (excluding the minimum 15-percent initial payment). CCC also covers a portion of interest on a variable rate basis. CCC agrees to pay exporters or their assignee financial institutions in the event a foreign bank fails to make payment pursuant to the terms of the letter of credit. FGP does not cover the risk of defaults on credits or loans extended by foreign banks to importers or owners of facilities.

NORTH AMERICAN EXPORT GRAIN ASSOCIATION, INC.

FREE ON BOARD EXPORT CONTRACT U.S.A./CANADA

NO. 2

Revised as of May 1, 2000

Contract No. _____

New York, N.Y. _____ 20 _____

1. Sold by _____

2. Purchased by _____

3. Broker/Agent _____

4. Quantity _____

in bulk, including dockage, 5% more or less at buyer's option, and at market price (per Clause 10) as follows: If the first delivery under this contract is for a quantity between contract minimum and contract maximum (both inclusive), no further deliveries shall be made. If this contract is to be executed by more than one vessel, the loading tolerance of 5% more or less shall apply on the difference between the mean contract quantity and the quantity that has been delivered on all prior vessels. Any delivery which falls within this difference, plus or minus 5%, shall complete the contract.

5. Weight _____ Quantity to be final at port of loading in accordance with customary weight certificates. 1,016 kilos shall be equal to 2,240 lbs.

6. Commodity _____

in accordance with the official grain standards of the United States or Canada, whichever applicable, in effect on the date of this contract.

7. Quality _____ Quality and condition to be final at port of loading in accordance with official inspection certificates.

In case of delivery at St. Lawrence ports, quality and condition to be final in accordance with Lake and/or loading ports official inspection certificates; Lake inspection certificates to be properly identified at ports of shipment.

Each party hereby authorizes the other party to request in both parties' names an appeal inspection under the U.S. Grain Standards Act at any time prior to or during the loading of the vessel, and whether or not such request was filed before commencement of loading. The cost of such appeal inspection, unless otherwise stipulated in this contract, shall be borne by the party requesting it.

Delivery of higher grades of grain of the same type and description is permissible. The commodity is not warranted free from defect, rendering same unmerchantable, which would not be apparent on reasonable examination, any statute or rule of law to the contrary notwithstanding.

8. Delivery _____ Delivery shall be made between _____ and _____, both inclusive

(the "delivery period"), at discharge end of loading spout, to buyer's tonnage in readiness to load, in accordance with custom of the port and subject to the elevator tariff to the extent that it does not conflict with the terms of this contract. Incorporation of a loading rate guaranty in this contract shall not entitle seller to delay delivery.

Buyer shall give vessel nominations ("preadvice") in accordance with Clause 15, in time for seller to receive minimum _____ days notice of probable readiness of tonnage and quantities required (the "preadvice period"). Buyer to keep seller informed of changes in expected date of vessel readiness.

Time for the preadvice shall be deemed to commence to count at 1200 noon, local time at place of receipt, on the business day of receipt by seller and shall be counted in consecutive periods of 24 hours.

Seller shall, if applicable, declare port and berth of loading within a reasonable time (but not later than _____ days) after receipt by seller of the preadvice, except that seller shall not be obligated to make such declaration earlier than (a) the 8th day prior to commencement of the delivery period for port declaration and (b) the 5th day prior to commencement of the delivery period for berth declaration.

The vessel shall not be prevented from filing and from taking its place in the vessel line-up at the designated port/berth during the preadvice period or before commencement of the delivery period, notwithstanding which, seller shall not be obliged to effect delivery to the vessel before the expiration of the preadvice period or before commencement of the delivery period. For the purposes of this contract a vessel shall be considered filed when it (a) has tendered valid notice of readiness to load to the charterer or its agent, at the port of loading, (b) has given written advice of such tender to the loading elevator, complete with all customarily required documents, such advice having been presented between the hours of 0900 and 1600 local time on a business day or between the hours of 0900 and 1200 noon on Saturday (provided not a holiday) and (c) is ready to receive grain in the compartments required for loading under this contract.

Buyer shall be allowed to make one substitution of a vessel, provided the substituting vessel is of the same type and approximately the same size and position. If the original or the substituting vessel is unable to lift the commodity by reason of the vessel having sunk or having suffered incapacitating physical damage, an additional substitution shall be made of a vessel of the same type and approximately the same size, and with a position agreeable to buyer and seller. Such agreement shall not be unreasonably withheld. The nomination of the substituting vessel shall be subject to the preadvice requirements of this clause, regardless of any preadvice previously given, unless the estimated time of arrival of the substituting vessel is the same as the estimated time of arrival of the original vessel when nominated. No substitution of vessels other than as provided in this clause shall be made. If this is a "named vessel" contract, no substitution other than after a casualty as described above shall be permitted.

Bills of lading and/or mate's receipts to be considered proof of date of delivery in the absence of evidence to the contrary. Any delivery in part fulfillment of this contract shall be considered as if made under a separate contract.

9. Days _____ In any month containing an odd number of days, the middle day shall be reckoned as belonging to both halves of the month.

10. Price

_____ per _____
 free on board buyer's tonnage at _____

If this contract is for a flat price, any variance in quantity from the mean contract quantity shall be settled basis the FOB market value (as defined in paragraph (a) and (b) below).

If the contract price is to be established on an exchange of futures, futures shall be exchanged prior to delivery of the commodity or at least 5 calendar days prior to the last trading day of the applicable futures month, whichever is earlier, to the nearest 5,000 bushels of the mean contract quantity. If deliveries under this contract result in a variance from the mean contract quantity, there shall be another exchange of futures as soon as possible after the last date of loading to bring the resulting amount of futures exchanged to the nearest 5,000 bushels of the quantity delivered. All exchanges of futures shall be made within the range of prices prevailing on the futures market on the date of the exchange. The variance from the mean contract quantity shall be settled basis the market value of the premium (as defined in paragraph (a) and (b) below).

- (a) The FOB (flat price) market value, or the market value of the premium, as the case may be, shall be that prevailing on the close of the appropriate market in the country of origin of the commodity on the last date of loading, if such be a business day, otherwise on the close of such market on the previous business day.
- (b) In the event the parties do not agree on the market value by the time the shipping documents are ready to be transmitted to buyer, seller shall invoice the entire shipment provisionally at contract price. Thereafter, final invoice for the difference between contract price and market value shall be presented as soon as possible and payment shall be made immediately.

11. Payment

*(a) Net cash by irrevocable divisible letters of credit issued or confirmed by a prime U.S. bank in New York (or _____ by mutual agreement), available by sight drafts accompanied by shipping documents per Clause 12 (or warehouse receipts if option (c) of Clause 18 is exercised). Such letters of credit, in a form acceptable to seller, shall be established not later than 5 days prior to the beginning of the delivery period, and shall be valid at least until the 30th day after expiration of the delivery period. Should delivery be delayed beyond the delivery period, buyer, if requested by seller, shall amend letters of credit accordingly and buyer shall increase the amount of the letter of credit to provide for carrying charges, if applicable. All bank charges shall be for buyer's account.

—or—

*(b) Net cash in U.S. Dollars, by telegraphic transfer to the bank designated by seller, against presentation of and in exchange for shipping documents per Clause 12 (or warehouse receipts if option (c) of Clause 18 is exercised). Such presentation shall be made in the city of _____

All bank charges in connection with payment shall be for buyer's account.

—or—

*(c) _____

*Delete paragraphs which are not applicable.

12. Shipping Documents

Payment to be made against bills of lading or mate's receipts (at seller's option), and weight and inspection certificates. However, if practicable, seller shall follow instructions of buyer in establishing bills of lading containing such clauses as buyer's/vessel's agents or owners usually endorse or attach. Buyer shall accept such bills of lading but seller assumes no responsibility for their correctness.

13. Notice of Delivery

Notice of delivery stating vessel's name, dates of bills of lading (or mate's receipts), quantities and qualities loaded (including percentage of dockage if applicable) shall be given or passed on by seller to buyer without undue delay. Notices of delivery shall be subject to correction of any errors.

14. Insurance

Marine and war risk (plus strikes, riots, civil commotions and mine risk) insurance, covering seller's/buyer's interests as they may appear, is to be covered by buyer with first-class approved companies and/or underwriters and to be confirmed by such companies and/or underwriters to seller at least 5 days prior to the expected readiness of the vessel. If this confirmation is not received by seller by such time, seller may place such insurance for buyer's account and at buyer's risk and expense.

15. Communications

All notices under this contract shall be given by letter, if delivered by hand on the day of writing, or by cable, telex or other method of rapid written communication. Any notice received after 1600 hours (local time at place of receipt) on a business day shall be deemed to have been received on the following business day, except that for notices given and received by parties which are both located in the Continental United States and/or Canada, the reference herein to 1600 hours shall signify 1600 hours New York City time (E.S.T. or E.D.T., as in effect on date of receipt of the notice).

16. Circles

- (a) For the purposes of this clause, a circle shall consist of a series of contracts in which each seller is also a buyer of a commodity of the same description and quality, for delivery at the same ports and with compatible delivery periods.
- (b) If this contract forms part of a circle, each party may agree with the other parties in the circle to forego actual delivery and to participate in a clearing agreement for the settlement of contract price differences. Monies due and owed to parties in the circle shall be payable on the middle day of the contract delivery period.
- (c) If a circle can be shown to exist but no clearing agreement has been reached by the 10th calendar day following the last day of the delivery period, actual delivery shall not be made and payment shall be made by each buyer to its seller of the excess of seller's invoice amount over the lowest invoice amount in the circle. Such payments shall be made promptly after the 10th calendar day following the last day of the delivery period.
- (d) Should any party in a circle fail to make payment on the due date as required under paragraph (b) or (c) above for reasons cited in Clause 23 or for any other reason, payment shall be made between each buyer and its seller of the difference between the seller's invoice amount at contract price and the market value of the commodity on date of insolvency or default, as the case may be. Such payment shall be made latest on the 2nd business day after the due date under paragraph (b) or (c) above.
 Payments already made under paragraph (b) or (c) above shall be refunded.
- (e) All circle settlements shall be based on the mean contract quantity.
 If a circle under paragraph (b), (c) or (d) above exists, Clause 21 shall not apply and Clauses 18 and 20 shall not be invoked.
 Payments due on a non-business day shall be made not later than the following business day.
 All payments made after the delivery period shall include carrying charges from the day following the last day of the delivery period, to the date of payment, at the rates stipulated in this contract. These carrying charges shall be settled individually between each buyer and its seller.
- (f) The parties agree that any dispute arising out of the voluntary clearing agreement entered into in accordance with paragraph (b) above shall be subject to arbitration as to any party thereto. Such arbitration shall be conducted in accordance with the provisions of Clause 30.

17. U.S./Canadian Government Rules and Regulations Buyer and seller agree to comply with the U.S. and Canadian regulatory prerequisites applicable to this contract, including, but not limited to, those governing any export subsidy, destination controls, government financing of agricultural commodities and the monitoring of export purchases and sales. Any losses, fines, penalties, expenses, costs or damages incurred as a result of failure to perform in accordance with this provision shall be borne by the party responsible for such failure.

18. Failure to Take Delivery If vessel fails to file before the end of the delivery period, buyer shall be in breach of contract and seller shall carry the grain for buyer's account and risk as provided in Clause 19. In the event that buyer has not given vessel nominations conforming to the applicable provisions of Clause 8 by the 15th calendar day following the last day of the delivery period, or if the vessels having been nominated within such time, fail to file by the 35th calendar day following the last day of the delivery period, seller may, in its discretion: (a) continue to carry the commodity for buyer's account and risk, (b) declare buyer in default, or (c) tender to buyer proper warehouse receipts in a quantity equal to the mean quantity open under this contract, in exchange for which buyer shall pay at contract price plus accrued carrying charges, but less out-elevation and outbound weighing and inspection charges. Such tender of warehouse receipts shall be deemed due performance of the contract by seller.

SPECIAL PROVISIONS FOR CONTRACTS PROVIDING FOR DELIVERY AT ST. LAWRENCE, GREAT LAKES OR HUDSON BAY PORTS:

- (1) Seller shall be barred from declaring option (b) above while the navigation in the designated delivery area is officially closed for the ice season, and for 20 days thereafter.
- (2) However, if options (a), (b) and (c) above become available to seller only while the navigation is officially closed, the seller may declare option (b) during the first 10 days it becomes available to him; thereafter, he shall be barred from declaring it, until the 21st day after the official opening of navigation.
- (3) If seller carries the grain into the new season for buyer's account, buyer shall have the right to nominate vessels per Clause 8, regardless of whether vessels were already nominated during the delivery period.

19. Carrying Charges If the commodity is being carried for buyer's account and risk as provided in Clause 18, it is mutually agreed that carrying charges, consisting of storage, insurance and interest, shall accrue as follows:

(a) Storage and insurance from the day following the last day of the delivery period up to and including the dates of delivery (or if seller exercises option (b) or (c) of Clause 18, the date applicable thereto), both dates inclusive, at the following rates:

_____ U.S. cents per bushel per day _____
_____ U.S. cents per bushel per day _____

(b) Interest from the day following the last day of the delivery period up to and including the last day of delivery (or if seller exercises option (b) or (c) of Clause 18, the date applicable thereto), both dates inclusive, at the following rates:

Carrying charges for the delivery completing this contract shall be computed on the mean contract quantity less the amounts previously delivered (if any), irrespective of whether or not buyer has availed himself of the loading tolerance option under Clause 4. It is further expressly agreed that carrying charges as provided herein are to be construed in the nature of liquidated damages and, as such, that no further proof of damages shall be required in substantiation thereof.

20. Strikes or Other Causes of Delay in Delivery (a) This clause shall apply if delivery by seller of the commodity, or any part thereof, is prevented or delayed at the port(s) of delivery and/or elevator(s) of delivery or elsewhere, or if the forwarding of the commodity to such port(s) and/or elevator(s) is prevented, by reason of the causes enumerated in paragraph (b) below; PROVIDED that seller shall have sent notice to buyer not later than 2 business days after the date of commencement of the causes, or not later than 2 business days after the 1st day of the delivery period, whichever occurs later (except that subsequent sellers shall not be bound by these deadlines, provided they pass along the notice to their buyer, without delay); and PROVIDED further that seller shall, at buyer's request, furnish a certificate of the North American Export Grain Association, Inc., certifying the existence and the duration of the causes. Such certificate shall be final.

(b) The causes of delay and/or prevention ("causes") referred to in paragraph (a) above shall be:

- (1) Riots, strikes, lockouts, interruptions in or stoppages of the normal course of labor,
- (2) Embargoes or exceptional impediments to transportation,
- (3) Action by Federal, State or local government or authority.

(c) The obligation of seller to make delivery shall be suspended while the causes are in effect, until the termination of the causes and/or the resumption of work after the termination of the causes, whichever is later. Seller shall not be responsible for further delays after resumption of work (whether such termination or resumption of work occurs prior to, during or after the delivery period) except that, if a vessel nominated under this contract is not loaded in the proper rotation but is bypassed by vessels (other than liners) which had filed after the vessel nominated under this contract, seller shall pay to buyer damages equal to the actual working time lost (weather working days, Saturdays, Sundays and holidays excluded) to buyer's vessel during the loading of the bypassing vessels, at the demurrage rate in the Charter Party for the vessel nominated under this contract.

If the Charter Party of the vessel under this contract does not indicate a demurrage rate, the damages are to be calculated at a reasonable demurrage rate predicated on the then current market, to be agreed upon amicably or to be determined by arbitration.

(d) (1) If the causes commence before or during the delivery period and terminate during or after delivery period, then the delivery period shall be deemed to be extended by a number of days equivalent to the period starting with the commencement of the causes or the commencement of the delivery period, whichever is later, and ending with the termination of the causes, and/or the resumption of work after the termination of the causes, whichever is later.

(2) If the causes commence during the additional time afforded to buyer under Clause 18 with respect to vessel nominations and filings, then the right of seller to exercise option (b) or (c) under Clause 18 shall be deemed to be delayed by a number of days equivalent to the period starting with the commencement of the causes and ending with the termination of the causes and/or the resumption of work after the termination of the causes, whichever is later.

(e) Carrying charges, if due under Clauses 18/19, shall begin to accrue on the day following the last day of the delivery period, as extended by paragraph (d)(1) above; however, if this clause becomes operative while carrying charges are already accruing, then such charges shall continue to accrue as they would in the absence of the causes.

- 21. Prohibition** In case of prohibition of export, blockade or hostilities or in case of any executive or legislative act done by or on behalf of the government of the country of origin or of the territory where the ports of shipment named herein are situate, restricting export, whether partially or otherwise, any such restriction shall be deemed by both parties to apply to this contract and to the extent of such total or partial restriction to prevent fulfillment and to that extent this contract or any unfulfilled portion thereof shall be cancelled without prejudice to seller's entitlement to carrying charges. Seller shall advise buyer without delay of the reasons therefor, and if required by buyer, seller shall provide certification of the North American Export Grain Association, Inc., as sufficient evidence for cancellation under this clause.
- 22. Default** In case of default by either party, the other party shall be at liberty, after giving notice, to resell or repurchase, as the case may be, without undue delay and the defaulting party shall make good the loss, if any, to the other party but the defaulting party shall not be entitled to any profit. If the non-defaulting party has not repurchased or resold the commodity by the 10th calendar day after the giving of notice of default, the market value on the said 10th day shall be used for settlement purposes. If such 10th day falls on a non-business day, the market value on the previous business day shall govern. In the event of a default by buyer, the sale price under this contract shall automatically be increased by the value of carrying charges calculated up to the date of resale, or the 10th calendar day after the giving of notice of default, whichever is applicable.
- 23. Insolvency** Either party shall, at any time after sending notice, have the right to terminate this contract and to recover the loss (if any) in the event that:
- (a) the other party suspends payment or commits an act of bankruptcy;
 - or-
 - (b) reasonable grounds for insecurity having arisen with respect to the financial capacity of the other party to perform under this contract, and a written demand for adequate assurance of due performance having been made, such assurance is not received within a period of time not exceeding 5 days.
- 24. Construction** For the purposes of this contract, except as otherwise expressly provided or unless the context otherwise requires, plural terms include the singular.
- 25. Passage of Title** Anything in this contract to the contrary notwithstanding, seller shall retain title to the commodity until seller has been paid in full (per Clause 11), it being understood that risk of loss shall pass to buyer on delivery at discharge end of loading spout (per Clause 8).
- 26. Limitation of Liability** The liability of the seller under the contract, except as expressly stated herein, shall be limited to its actions in delivering the commodity at discharge end of loading spout and to presentation of the contractually required documentation. Any claims, losses, costs, damages, etc. arising from events or actions thereafter shall be the responsibility of the buyer, who shall indemnify seller for all costs (including attorney fees) and damages thereby incurred.
- 27. International Conventions** The following shall not apply to this contract:
- (a) the Uniform Law on the International Sale of Goods and the Uniform Law on the Formation of Contracts for the International Sale of Goods;
 - (b) the United Nations Convention on Contracts for the International Sale of Goods of 1980; and
 - (c) the United Nations Convention on the Limitation Period in the International Sale of Goods, concluded at New York on 14 June 1974, and the Protocol Amending the Convention on the Limitation Period in the International Sale of Goods, concluded at Vienna on 11 April 1980.
- 28. Governing Law** The parties agree that this contract shall be governed by the laws of the State of New York, notwithstanding any choice of law provision to the contrary.
- 29. Other Conditions**
- 30. Arbitration** Buyer and seller expressly agree that any controversy or claim arising out of, in connection with or relating to this contract, or the interpretation, performance or breach thereof, shall be settled by arbitration in the City of New York before the American Arbitration Association (AAA), or its successors, in accordance with the International Arbitration Rules of the American Arbitration Association, as those Rules may be in effect at the time of such arbitration proceeding, which Rules are hereby deemed incorporated herein and made a part hereof, and under the laws of the State of New York. The number of arbitrators shall be three. Each party shall designate one arbitrator, and those two shall name a third, with the AAA making appointments if the tribunal is not formed by this procedure. The arbitrator named by the party-appointed arbitrators shall be from the list of grain arbitrators maintained by the AAA. Any arbitrator appointed by the AAA may be from the list of grain arbitrators maintained by the AAA or the AAA Commercial Arbitration Panel. The language of the arbitration shall be English. In disputes involving a "string" of contracts, two or more arbitrations may be consolidated before the same tribunal, at the written request of any party. The tribunal in consolidated arbitrations shall be mindful of differences in terms between the various contracts and in the action of the parties, and vary the award from contract to contract, if indicated. The arbitration award shall be final and binding on the parties and judgment upon such arbitration award may be entered in the Supreme Court of the State of New York or any other court having jurisdiction thereof. Buyer and seller hereby recognize and expressly consent to the jurisdiction over each of them of the American Arbitration Association or its successors, and all of the courts of the State of New York. The parties agree that arbitration awards may be released by the AAA to the North American Export Grain Association, Inc., for distribution to the interested public. Buyer and seller agree that this contract shall be deemed to have been made in New York State and be deemed to be performed there, any reference herein or elsewhere to the contrary notwithstanding.

NORTH AMERICAN EXPORT GRAIN ASSOCIATION, INC.

ADDENDUM NO. 1
TO NORTH AMERICAN EXPORT GRAIN ASSOCIATION, INC., F.O.B. CONTRACT NO. 2
(REVISED AS OF MAY 1, 2000)

LOADING RATE GUARANTY

This Addendum shall apply if the parties have agreed to be bound by a loading rate guaranty, and provided that lifting under this contract is by one self-trimming bulk carrier only.

1. Seller guarantees to deliver at an average rate of _____ long tons per weather working day of 24 consecutive hours, Saturdays, Sundays and holidays excepted, provided vessel can receive at such rate. Holidays shall be those listed as such in the BIMCO Holiday Calendar and/or in the elevator tariff.

For this purpose, laytime shall commence to count:

- (a) at 0700 hours on the business day following filing of the vessel in accordance with Clause 8 of North American Export Grain Association, Inc., FOB Contract No. 2 ("NAEGA 2"),

—or—

- (b) at 0700 hours on the business day following expiration of the preadvise period stipulated in Clause 8 of NAEGA 2, unless an earlier date is agreed to by both parties,

—or—

- (c) at 0000 hours on the first business day of the contract delivery period, unless an earlier date is agreed to by both parties, whichever is the latest, whether vessel is in berth or not.

2. Should seller deliver at less than the stipulated rate, seller to pay buyer demurrage at \$ _____ for each additional day (or pro-rata for part of day) used. Should seller deliver faster than at the stipulated rate, buyer to pay seller despatch money at half the demurrage rate, i.e., \$ _____ per day, for each day (or pro-rata for part of day) of laytime saved.

3. Any overtime work performed by the elevator and/or grain inspection and weighing services and/or stevedores shall be for seller's account if ordered by the elevator or the Port Authority; otherwise, for account of the party ordering the overtime.

4. If Clause 20 of NAEGA 2 has been duly invoked, time shall not count for demurrage purposes while the causes are in effect, until the termination of the causes and/or the resumption of work after the termination of the causes, whichever is later, and for an additional period ("additional period") of equal duration, but such additional period not to exceed 30 days. However, for purposes of settling despatch accounts only, any time lost in delivering through any of the causes, and the additional period, shall be counted as time used in loading.

If during the additional period the vessel nominated under this contract is not loaded in proper rotation but is bypassed by vessels (other than liners) which had filed after the vessel nominated under this contract, seller shall pay to buyer damages equal to the actual working time lost (i.e., weather working days, but Saturdays, Sundays and holidays excluded) to buyer's vessel during the loading of the bypassing vessels, at the demurrage rate stipulated in Clause 2 above. The provisions regarding payment of damages under paragraph (c) of Clause 20 of NAEGA 2 shall not apply to this Addendum.

Notwithstanding the above, if time has started to count under Clause 1 above within the delivery period, and demurrage is already accruing under this Addendum when the causes of prevention or delay commence under Clause 20 of NAEGA 2, demurrage shall continue to accrue as if these causes did not exist. In such case, the preceding paragraph shall be deemed to be deleted.

5. Buyer's or seller's claim under this Addendum shall be accompanied by the statement of facts at loading, signed on behalf of the owner and the charterer or on behalf of the owner and by the supplier, and such other papers as may be necessary to process the claim. If payment is not made within 40 days from date of mailing of properly documented claim, interest shall accrue, starting on the 41st day after such mailing, and shall be computed on the final amount due, at the rate of interest stipulated elsewhere in this contract, up to the date of payment of the claim.

6. If vessel nominated under this contract also lifts additional commodities (grain and/or oilseeds), regardless of whether or not such commodities are covered by loading rate guaranties, the following shall apply:

- (a) For commodities delivered to vessel at the same berth:

The "time allowed" shall be arrived at by dividing the tonnage loaded under this contract by the daily rate stipulated in Clause 1 above. A calculation of "total time used" for all the commodities loaded at the berth shall be made, in which any such time in excess of the "time allowed" shall be computed as time on demurrage. The "total time used" shall then be pro-rated to the tonnage loaded under this contract. The "time allowed" shall be deducted from this pro-rated figure to arrive at the time on demurrage or time saved under this contract.

- (b) If the commodities other than those under this contract are delivered at (an)other berth(s) in the same port:

The waiting time ("waiting time") at the first berth shall be pro-rated among all the contracts for the commodities to be delivered to the vessel.

The time spent getting to and used at the first berth ("berth time") shall be pro-rated among the contracts loaded at the first berth.

The waiting time at the second berth shall be pro-rated among all remaining contracts for the commodities yet to be delivered to the vessel.

The berth time at the second berth shall be pro-rated among the contracts loaded at the second berth.

Waiting time and berth time for berths subsequent to the second berth shall be treated in a similar manner as for the second berth.

Waiting time shall cease and berth time begin when pilot is on board and vessel lifts anchor in order to proceed to the loading berth.

Berth time shall cease when loading is completed at that berth and waiting time shall begin when vessel drops anchor in waiting area after having sailed from berth.

If no waiting time is involved between berths, berth time at the next berth shall begin when vessel sails from the previous berth.

If, between the time that the vessel is ordered into a berth and the time of completion of loading at that berth, the vessel is ordered into one or more other berths, subsequently incurred waiting time at this (these) other berth(s) shall not count.

- (c) If the commodities other than those under this contract are delivered at (an)other port(s):

The laytime statement shall be prepared as if the vessel had not called at another port. If the commodities under this contract are loaded at the second or a subsequent port, the words "filing of the vessel in accordance with Clause 8 of the North American Export Grain Association, Inc., FOB Contract No. 2 ("NAEGA 2")" in Clause 1(a) above shall be deemed to read "presentation of the vessel's passes". If, however, the first and second or subsequent ports have been nominated by the seller of the grain under this contract, laytime for the second and/or subsequent port(s) shall commence upon vessel's arrival at that or the subsequent port(s); except that, if vessel fails inspection at such port(s), laytime shall cease to count until vessel passes.

7. If vessel fails reinspection at the loading berth, laytime shall cease to count until vessel passes.
8. Any trimming costs as well as overtime costs for performing trimming shall be for buyer's account. Any time used for trimming shall not count as laytime and/or shall be exempt from demurrage, unless loading operations are being carried on simultaneously in other holds.
9. Other Conditions:

10. Buyer and seller expressly agree that any controversy or claim arising out of, in connection with or relating to this contract, or the interpretation, performance or breach thereof, shall be settled by arbitration in the City of New York before the American Arbitration Association (AAA), or its successors, in accordance with the International Arbitration Rules of the American Arbitration Association, as those Rules may be in effect at the time of such arbitration proceeding, which Rules are hereby deemed incorporated herein and made a part hereof, and under the laws of the State of New York. The number of arbitrators shall be three. Each party shall designate one arbitrator, and those two shall name a third, with the AAA making appointments if the tribunal is not formed by this procedure. The arbitrator named by the party-appointed arbitrators shall be from the list of grain arbitrators maintained by the AAA. Any arbitrator appointed by the AAA may be from the list of grain arbitrators maintained by the AAA or the AAA Commercial Arbitration Panel. The language of the arbitration shall be English. In disputes involving a "string" of contracts, two or more arbitrations may be consolidated before the same tribunal, at the written request of any party. The tribunal in consolidated arbitrations shall be mindful of differences in terms between the various contracts and in the action of the parties, and vary the award from contract to contract, if indicated. The arbitration award shall be final and binding on the parties and judgment upon such arbitration award may be entered in the Supreme Court of the State of New York or any other court having jurisdiction thereof. Buyer and seller hereby recognize and expressly consent to the jurisdiction over each of them of the American Arbitration Association or its successors, and all of the courts of the State of New York. The parties agree that arbitration awards may be released by the AAA to the North American Export Grain Association, Inc., for distribution to the interested public. Buyer and seller agree that this contract shall be deemed to have been made in New York State and be deemed to be performed there, any reference herein or elsewhere to the contrary notwithstanding.

BUYER

SELLER

Subpart B -- United States Standards for Barley

Terms Defined

§ 810.201 Definition of barley.

Grain that, before the removal of dockage, consists of 50 percent or more of whole kernels of cultivated barley (*Hordeum vulgare* L.) and not more than 25 percent of other grains for which standards have been established under the United States Grain Standards Act. The term "barley" as used in these standards does not include hull-less barley or black barley.

§ 810.202 Definition of other terms.

(a) *Black barley*. Barley with black hulls.

(b) *Broken kernels*. Barley with more than 1/4 of the kernel removed.

(c) *Classes*. There are two classes of barley: Malting barley and Barley.

(1) *Malting barley*. Barley of a six-rowed or two-rowed malting type. The class Malting barley is divided into the following three subclasses:

(i) *Six-rowed Malting barley*. Barley that has a minimum of 95.0 percent of a six-rowed suitable malting type that has 90.0 percent or more of kernels with white aleurone layers that contains not more than 1.9 percent injured-by-frost kernels, 0.4 percent frost-damaged kernels, 0.2 percent injured-by-heat kernels, and 0.1 percent heat-damaged kernels. Six-rowed Malting barley shall not be infested, blighted, ergoty, garlicky, or smutty as defined in § 810.107(b) and § 810.206.

(ii) *Six-rowed Blue Malting barley*. Barley that has a minimum of 95.0 percent of a six-rowed suitable malting type that has 90.0 percent or more of kernels with blue aleurone layers that contains not more than 1.9 percent injured-by-frost kernels, 0.4 percent frost-damaged kernels, 0.2 percent injured-by-heat kernels, and 0.1 percent heat-damaged kernels. Six-rowed Blue Malting barley shall not be infested, blighted, ergoty, garlicky, or smutty as defined in §810.107(b) and §810.206.

(iii) *Two-rowed Malting barley*. Barley that has a minimum of 95.0 percent of a two-rowed suitable malting type that contains not more than 1.9 percent injured-by-frost kernels, 0.4 percent frost-damaged kernels, 0.2 percent injured-by-heat kernels, 0.1 percent heat-damaged kernels, 1.9 percent injured-by-mold kernels, and 0.4 percent

Barley

mold-damaged kernels. Two-rowed Malting barley shall not be infested, blighted, ergoty, garlicky, or smutty as defined in § 810.107(b) and § 810.206.

(2) *Barley*. Any barley of a six-rowed or two-rowed type. The class Barley is divided into the following three subclasses:

(i) *Six-rowed barley*. Any six-rowed barley that contains not more than 10.0 percent of two-rowed varieties.

(ii) *Two-rowed barley*. Any two-rowed barley with white hulls that contains not more than 10.0 percent of six-rowed varieties.

(iii) *Barley*. Any barley that does not meet the requirements for the subclasses Six-rowed barley or Two-rowed barley.

(d) *Damaged kernels*. Kernels, pieces of barley kernels, other grains, and wild oats that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, injured-by-heat, insect-bored, mold-damaged, sprout-damaged, or otherwise materially damaged.

(e) *Dockage*. All matter other than barley that can be removed from the original sample by use of an approved device according to procedures prescribed in FGIS instructions. Also, underdeveloped, shriveled, and small pieces of barley kernels removed in properly separating the material other than barley and that cannot be recovered by properly rescreening or recleaning.

(f) *Foreign material*. All matter other than barley, other grains, and wild oats that remains in the sample after removal of dockage.

(g) *Frost-damaged kernels*. Kernels, pieces of barley kernels, other grains, and wild oats that are badly shrunken and distinctly discolored black or brown by frost.

(h) *Germ-damaged kernels*. Kernels, pieces of barley kernels, other grains, and wild oats that have dead or discolored germ ends.

(i) *Heat-damaged kernels*. Kernels, pieces of barley kernels, other grains, and wild oats that are materially discolored and damaged by heat.

- (j) *Injured-by-frost kernels.* Kernels and pieces of barley kernels that are distinctly indented, immature, or shrunken in appearance or that are light green in color as a result of frost before maturity.
- (k) *Injured-by-heat kernels.* Kernels, pieces of barley kernels, other grains, and wild oats that are slightly discolored as a result of heat.
- (l) *Injured-by-mold kernels.* Kernels and pieces of barley kernels containing slight evidence of mold.
- (m) *Mold-damaged kernels.* Kernels, pieces of barley kernels, other grains, and wild oats that are weathered and contain considerable evidence of mold.
- (n) *Other grains.* Black barley, corn, cultivated buckwheat, einkorn, emmer, flaxseed, guar, hull-less barley, nongrain sorghum, oats, Polish wheat, popcorn, poulard wheat, rice, rye, safflower, sorghum, soybeans, spelt, sunflower seed, sweet corn, triticale, and wheat.
- (o) *Plump barley.* Barley that remains on top of a 6/64 x 3/4 slotted-hole sieve after sieving according to procedures prescribed in FGIS instructions.
- (p) *Sieves.*
- (1) *5/64 x 3/4 slotted-hole sieve.* A metal sieve 0.032 inch thick with slotted perforations 0.0781 (5/64) inch by 0.750 (3/4) inch.
- (2) *5.5/64 x 3/4 slotted-hole sieve.* A metal sieve 0.032 inch thick with slotted perforations 0.0895 (5.5/64) inch by 0.750 (3/4) inch.
- (3) *6/64 x 3/4 slotted-hole sieve.* A metal sieve 0.032 inch thick with slotted perforations 0.0937 (6/64) inch by 0.750 (3/4) inch.
- (q) *Skinned and broken kernels.* Barley kernels that have one-third or more of the hull removed, or that the hull is loose or missing over the germ, or broken kernels, or whole kernels that have a part or all of the germ missing.
- (r) *Sound barley.* Kernels and pieces of barley kernels that are not damaged as defined under (d) of this section.
- (s) *Suitable malting type.* Varieties of malting barley that are recommended by the American Malting Barley Association and other malting type(s) used by the malting and brewing industry. The varieties are listed in GIPSA's instructions.

Barley

(t) *Thin barley*. Thin barley shall be defined for the appropriate class as follows:

(1) *Malting barley*. Six-rowed Malting barley that passes through a 5/64 x 3/4 slotted-hole sieve and Two-rowed Malting barley which passes through a 5.5/64 x 3/4 slotted-hole sieve in accordance with procedures prescribed in GIPSA's instructions.

(2) *Barley*. Six-rowed barley, Two-rowed barley, or Barley that passes through a 5/64 x 3/4 slotted-hole sieve in accordance with procedures prescribed in GIPSA's instructions.

(u) *Wild oats*. Seeds of *Avena fatua* L. and *A. sterilis* L.

Principles Governing the Application of Standards

§ 810.203 Basis of determination.

All other determinations. Each determination of heat-damaged kernels, injured-by-heat kernels, and white or blue aleurone layers in Six-rowed barley is made on pearled, dockage-free barley. Other determinations not specifically provided for under the *General Provisions* are made on the basis of the grain when free from dockage, except the determination of odor is made on either the basis of the grain as a whole or the grain when free from dockage.

Grades and Grade Requirements

§ 810.204 Grades and grade requirements for Six-rowed Malting barley and Six-rowed Blue Malting barley.

Grade	Minimum limits of--			Maximum limits of--				
	Test weight per bushel (pounds)	Suitable malting types (percent)	Sound barley ^{1/} (percent)	Damaged kernels ^{1/} (percent)	Foreign material (percent)	Other Grains (percent)	Skinned and broken kernels (percent)	Thin barley (percent)
U.S. No. 1	47.0	95.0	97.0	2.0	0.5	2.0	4.0	7.0
U.S. No. 2	45.0	95.0	94.0	3.0	1.0	3.0	6.0	10.0
U.S. No. 3	43.0	95.0	90.0	4.0	2.0	5.0	8.0	15.0
U.S. No. 4	43.0	95.0	87.0	5.0	3.0	5.0	10.0	15.0

^{1/} Injured-by-frost kernels and injured-by-mold kernels are not considered damaged kernels or considered against sound barley.

NOTES: Malting barley shall not be infested in accordance with § 810.107(b) and shall not contain any special grades as defined in § 810.206. Six-rowed Malting barley and Six-rowed Blue Malting barley varieties not meeting the requirements of this section shall be graded in accordance with standards established for the class Barley.

§ 810.205 Grades and grade requirements for Two-rowed Malting barley.

Grade	Minimum limits of -			Maximum limits of--			
	Test weight per bushel (pounds)	Suitable malting types (percent)	Sound barley ^{1/} (percent)	Wild oats (percent)	Foreign material (percent)	Skinned and broken kernels (percent)	Thin barley (percent)
U.S. No. 1	50.0	97.0	98.0	1.0	0.5	5.0	5.0
U.S. No. 2	48.0	97.0	98.0	1.0	1.0	7.0	7.0
U.S. No. 3	48.0	95.0	96.0	2.0	2.0	10.0	10.0
U.S. No. 4	48.0	95.0	93.0	3.0	3.0	10.0	10.0

^{1/} Injured-by-frost kernels and injured-by-mold kernels are not considered damaged kernels or considered against sound barley.

NOTES: Malting barley shall not be infested in accordance with § 810.107(b) and shall not contain any special grades as defined in § 810.206. Two-rowed Malting barley varieties not meeting the requirements of this section shall be graded in accordance with standards established for the class Barley.

Barley

§ 810.206 Grades and grade requirements for barley.

Grade	Minimum limits of		Maximum limits of				
	Test weight per bushel (pounds)	Sound barley (percent)	Damaged kernels ^{1/2} (percent)	Heat-damaged kernels (percent)	Foreign material (percent)	Broken kernels (percent)	Thin barley (percent)
U.S. No. 1	47.0	97.0	2.0	0.2	1.0	4.0	10.0
U.S. No. 2	45.0	94.0	4.0	0.3	2.0	8.0	15.0
U.S. No. 3	43.0	90.0	6.0	0.5	3.0	12.0	25.0
U.S. No. 4	40.0	85.0	8.0	1.0	4.0	18.0	35.0
U.S. No. 5	36.0	75.0	10.0	3.0	5.0	28.0	75.0

U.S. Sample Grade:

U.S. Sample grade shall be barley that:

- (a) Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4, or 5; or
- (b) Contains 8 or more stones or any number of stones which have an aggregate weight in excess of 0.2 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (*Crotalaria* spp.), 2 or more castor beans (*Ricinus communis* L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cocklebur (*Xanthium* spp.) or similar seeds singly or in combination, 10 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1-1/8 to 1-1/4 quarts of barley; or
- (c) Has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or
- (d) Is heating or otherwise of distinctly low quality.

^{1/2} Includes heat-damaged kernels. Injured-by-frost kernels and injured-by-mold kernels are not considered damaged kernels.

Special Grades and Special Grade Requirements

§ 810.207 Special grades and special grade requirements.

- (a) *Blighted barley*. Barley that contains more than 4.0 percent of fungus-damaged and/or mold-damaged kernels.
- (b) *Ergoty barley*. Barley that contains more than 0.10 percent ergot.
- (c) *Garlicky barley*. Barley that contains three or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets in 500 grams of barley.
- (d) *Smutty barley*. Barley that has kernels covered with smut spores to give a smutty appearance in mass, or which contains more than 0.20 percent smut balls.

Subpart D -- United States Standards for Corn

Terms Defined

§ 810.401 Definition of corn.

Grain that consists of 50 percent or more of whole kernels of shelled dent corn and/or shelled flint corn (*Zea mays L.*) and not more than 10.0 percent of other grains for which standards have been established under the United States Grain Standards Act.

§ 810.402 Definition of other terms.

(a) *Broken corn.* All matter that passes readily through a 12/64 round-hole sieve and over a 6/64 round-hole sieve according to procedures prescribed in FGIS instructions.

(b) *Broken corn and foreign material.* All matter that passes readily through a 12/64 round-hole sieve and all matter other than corn that remains in the sieved sample after sieving according to procedures prescribed in FGIS instructions.

(c) *Classes.* There are three classes for corn: Yellow corn, White corn, and Mixed corn.

(1) *Yellow corn.* Corn that is yellow-kerneled and contains not more than 5.0 percent of corn of other colors. Yellow kernels of corn with a slight tinge of red are considered Yellow corn.

(2) *White corn.* Corn that is white-kerneled and contains not more than 2.0 percent of corn of other colors. White kernels of corn with a slight tinge of light straw or pink color are considered White corn.

(3) *Mixed corn.* Corn that does not meet the color requirements for either of the classes Yellow corn or White corn and includes white-capped Yellow corn.

(d) *Damaged kernels.* Kernels and pieces of corn kernels that are badly ground-damaged, badly weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, insect-bored, mold-damaged, sprout-damaged, or otherwise materially damaged.

(e) *Foreign material.* All matter that passes readily through a 6/64 round-hole sieve and all matter other than corn that remains on top of the 12/64 round-hole sieve according to procedures prescribed in FGIS instructions.

(f) *Heat-damaged kernels.* Kernels and pieces of corn kernels that are materially discolored and damaged by heat.

Corn

(g) Sieves.

(1) *12/64 round-hole sieve.* A metal sieve 0.032 inch thick with round perforations 0.1875 (12/64) inch in diameter which are 1/4 inch from center to center. The perforations of each row shall be staggered in relation to the adjacent row.

(2) *6/64 round-hole sieve.* A metal sieve 0.032 inch thick with round perforations 0.0937 (6/64) inch in diameter which are 5/32 inch from center to center. The perforations of each row shall be staggered in relation to the adjacent row.

Principles Governing the Application of Standards

§ 810.403 Basis of determination.

Each determination of class, damaged kernels, heat-damaged kernels, waxy corn, flint corn, and flint and dent corn is made on the basis of the grain after the removal of the broken corn and foreign material. Other determinations not specifically provided for under the general provisions are made on the basis of the grain as a whole, except the determination of odor is made on either the basis of the grain as a whole or the grain when free from broken corn and foreign material.

Grades and Grade Requirements

§ 810.404 Grades and grade requirements for corn.

Grade	Minimum test weight per bushel (pounds)	Maximum limits of:		
		Damaged kernels		Broken corn and foreign material (percent)
		Heat damaged kernels (percent)	Total (percent)	
U.S. No. 1	56.0	0.1	3.0	2.0
U.S. No. 2	54.0	0.2	5.0	3.0
U.S. No. 3	52.0	0.5	7.0	4.0
U.S. No. 4	49.0	1.0	10.0	5.0
U.S. No. 5	46.0	3.0	15.0	7.0
U.S. Sample Grade U.S. Sample grade is corn that: <ol style="list-style-type: none"> (a) Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4, or 5; or (b) Contains stones with an aggregate weight in excess of 0.1 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (<i>Crotalaria</i> spp.), 2 or more castor beans (<i>Ricinus communis</i> L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cockleburrs (<i>Xanthium</i> spp.), or similar seeds singly or in combination, or animal filth in excess of 0.20 percent in 1,000 grams; or (c) Has a musty, sour, or commercially objectionable foreign odor; or (d) Is heating or otherwise of distinctly low quality. 				

Special Grades and Special Grade Requirements

§ 810.405 Special grades and special grade requirements.

- (a) *Flint corn*. Corn that consists of 95 percent or more of flint corn.
- (b) *Flint and dent corn*. Corn that consists of a mixture of flint and dent corn containing more than 5.0 percent but less than 95 percent of flint corn.
- (c) *Waxy corn*. Corn that consists of 95 percent or more waxy corn, according to procedures prescribed in FGIS instructions.

Subpart I -- United States Standards for Sorghum

Terms Defined

§ 810.1401 Definition of sorghum.

Grain that, before the removal of dockage, consists of 50 percent or more of whole kernels of sorghum (*Sorghum bicolor* (L.) Moench) excluding nongrain sorghum and not more than 10.0 percent of other grains for which standards have been established under the United States Grain Standards Act.

§ 810.1402 Definitions of other terms.

(a) *Broken kernels*. All matter which passes through a 5/64 triangular-hole sieve and over a 2.5/64 round-hole sieve according to procedures prescribed in FGIS instructions.

(b) *Broken kernels and foreign material*. The combination of broken kernels and foreign material as defined in paragraphs (a) and (f) of this section.

(c) *Classes*. There are four classes of sorghum: Sorghum, Tannin sorghum, White sorghum, and Mixed sorghum.

(1) *Sorghum*. Sorghum which is low in tannin content due to the absence of a pigmented testa (subcoat) and contains less than 98.0 percent White sorghum and not more than 3.0 percent Tannin sorghum. The pericarp color of this class may appear white, yellow, pink, orange, red, or bronze.

(2) *Tannin sorghum*. Sorghum which is high in tannin content due to the presence of a pigmented testa (subcoat) and contains not more than 10.0 percent non-Tannin sorghum. The pericarp color of this class is usually brown but may also be white, yellow, pink, orange, red, or bronze.

(3) *White sorghum*. Sorghum which is low in tannin content due to the absence of a pigmented testa (subcoat) and contains not more than 2.0 percent sorghum of other classes. The pericarp color of this class is white or translucent and includes sorghum containing spots that, singly or in combination, cover 25.0 percent or less of the kernel.

(4) *Mixed sorghum*. Sorghum which does not meet the requirements for any of the classes Sorghum, Tannin sorghum, or White sorghum.

(d) *Damaged kernels*. Kernels, pieces of sorghum kernels, and other grains that are badly ground damaged, badly weather damaged, diseased, frost-damaged, germ-damaged, heat-

Sorghum

damaged, insect-bored, mold-damaged, sprout-damaged, or otherwise materially damaged.

(e) *Dockage*. All matter other than sorghum that can be removed from the original sample by use of an approved device according to procedures prescribed in FGIS instructions. Also, underdeveloped, shriveled, and small pieces of sorghum kernels removed in properly separating the material other than sorghum.

(f) *Foreign material*. All matter, except sorghum, which passes over the number 6 riddle and all matter other than sorghum that remains on the top of the 5/64 triangular-hole sieve according to procedures prescribed in FGIS instructions.

(g) *Heat-damaged kernels*. Kernels, pieces of sorghum kernels, and other grains that are materially discolored and damaged by heat.

(h) *Nongrain sorghum*. Seeds of broomcorn, Johnson-grass, *Sorghum alnum* Parodi, sorghum-sudangrass hybrids, sorgrass, sudangrass, and sweet sorghum (*sorgo*).

(i) *Pericarp*. The pericarp is the outer layers of the sorghum grain and is fused to the seedcoat.

(j) *Sieves*.

(1) *1.98 mm (5/64 (0.0781) inches) triangular-hole sieve*. A metal sieve 0.81 mm (0.032 inches) thick with equilateral triangular perforations the inscribed circles of which are 1.98 mm (0.0781 inches) in diameter.

(2) *0.99 mm (2 1/2/64 (0.0391) inches) round-hole sieve*. A metal sieve 0.81 mm (0.032 inch) thick with round holes 0.99 mm (0.0391 inches) in diameter.

Principles Governing the Application of Standards

§ 810.1403 Basis of determination.

Each determination of broken kernels and foreign material is made on the basis of the grain when free from dockage. Each determination of class, damaged kernels, heat-damaged kernels, and stones is made on the basis of the grain when free from dockage and that portion of the broken kernels, and foreign material that will pass through a 1.98 mm (5/64 inch) triangular-hole sieve. Other determinations not specifically provided for in the general provisions are made on the basis of the grain as a whole except the determination of odor is made on either the basis of the grain as a whole or the grain when free from dockage, broken kernels, and foreign material removed by the 1.98 mm (5/64 inch) triangular-hole sieve.

Sorghum Grades and Grade Requirements

§ 810.1404 - Grades and grade requirements for sorghum.

Grading factors	Grades U.S. Nos. ^{1/}			
	1	2	3	4
Minimum pound limits of				
Test weight per bushel:	57.0	55.0	53.0	51.0
Maximum percent limits of				
Damaged kernels:				
Heat (part of total)	0.2	0.5	1.0	3.0
Total	2.0	5.0	10.0	15.0
Broken kernels and foreign material:				
Foreign material (part of total)	1.5	2.5	3.5	4.5
Total	4.0	7.0	10.0	13.0
Maximum count limits of				
Other material:				
Animal filth	9	9	9	9
Castor beans	1	1	1	1
Crotalaria seeds	2	2	2	2
Glass	1	1	1	1
Stones ^{2/}	7	7	7	7
Unknown foreign substance	3	3	3	3
Cocklebur	7	7	7	7
U.S. Sample grade is sorghum that:				
(a) Does not meet the requirements for U.S. Nos. 1, 2, 3, or 4; or				
(b) Has a musty, sour or commercially objectionable foreign odor (except smut odor); or				
(c) Is badly weathered, heating or distinctly low quality.				
<hr/> ^{1/} Sorghum which is distinctly discolored shall not grade higher than U.S. No. 3. ^{2/} Aggregate weight of stones must also exceed 0.2 percent of the sample weight.				

Special Grades and Special Grade Requirements

§ 810.1405 Special grades and special grade requirements.

Smutty sorghum. Sorghum that has kernels covered with smut spores to give a smutty appearance in mass, or that contains 20 or more smut balls in 100 grams of sorghum.