ACE 427
Spring 2008

Lecture 9

Forecasting Use for Crops

by
Professor Scott H. Irwin

Required Reading:

Clemens, R. "Steady Supplies or Stockpiles? Dried Distillers Grain and U.S. Beef Production." ***Iowa Ag Review*****, Winter 2008, pp.4-5, 11. (class website)**

Recommended Reading:

Tomek. W.G. and K.L. Robinson. "Ch. 2: Demand forAgricultural Products," ***Agricultural Product Prices, Fourth Edition*****, Cornell University Press: Ithaca, New York, 2003.**

Forecasting Calendar for 2008/09 Crop Use Categories

Fall 2007: First forecasts of use for 2008/09 marketing year

- Typically based on _____ forecasts, recent history and basic _____ relationships

Spring and Summer 2008: Update use forecasts based on US and world production prospects

2008/09 Marketing Year: Update use forecasts based on export sales and inspections _____, quarterly USDA _____ reports and USDA _____ inventory reports

Theory of Demand

Consumer demand is defined as the various _____ of a particular commodity that an individual consumer is _____ and _____ to buy as the price of that commodity varies, with all other factors that affect demand held _____

Each of the following are demand _____

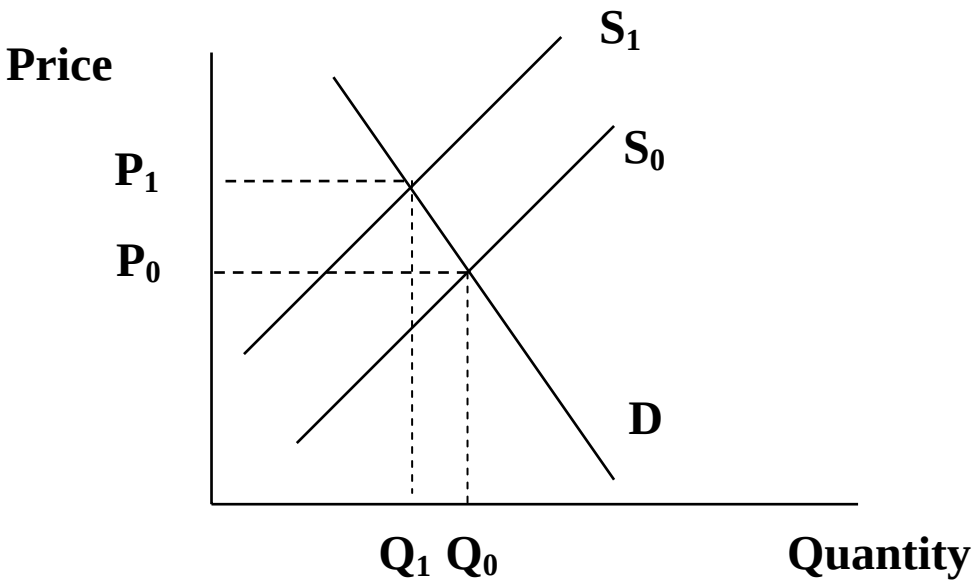
- _____ size and its distribution by age, geographic area, etc.
- _____ income and its distribution
- _____ and availability of other commodities
- _____ tastes and preferences

Demand and Use Terminology

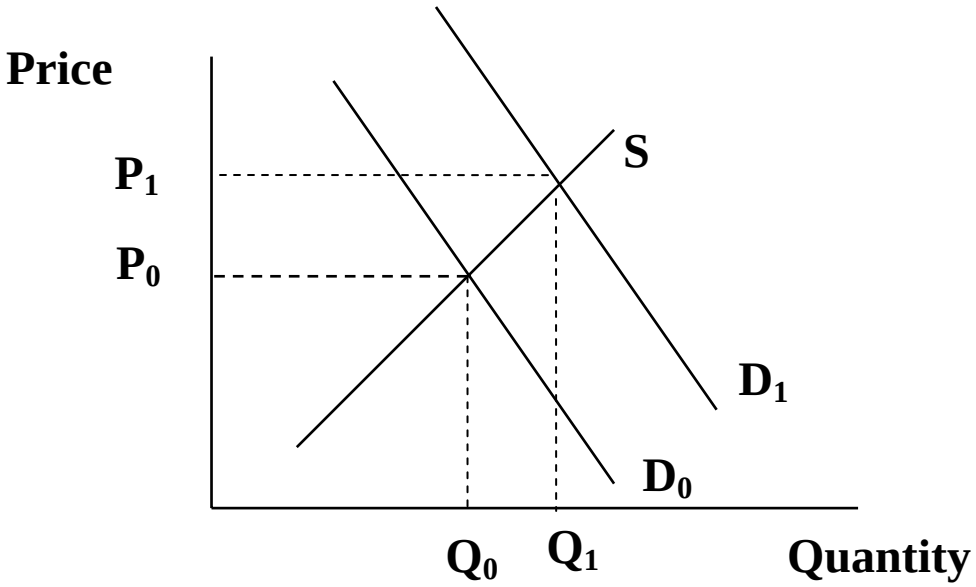
Changes in _____ and changes in _____ are NOT the same thing

- Change in quantity demanded is a movement _____ a demand curve
- Change in demand is a _____ in the demand curve

Change in Quantity Demanded



Change in Demand



Demand and use are also not the same thing

- Use (usage, utilization, consumption) is the equilibrium quantity observed in a market
- Use equals both the quantity _____ and quantity _____

Assume corn exports increase from the 2006/2007 to the 2007/2008 marketing year

Which is true?

- Corn export demand increased
- Corn quantity demanded increased
- Corn export use increased

Corn: Food, Seed, and Industrial Use

Rapid growth in last 20 years

- About 10% of use in early 1980s
- About 35% of use currently

Largest components are:

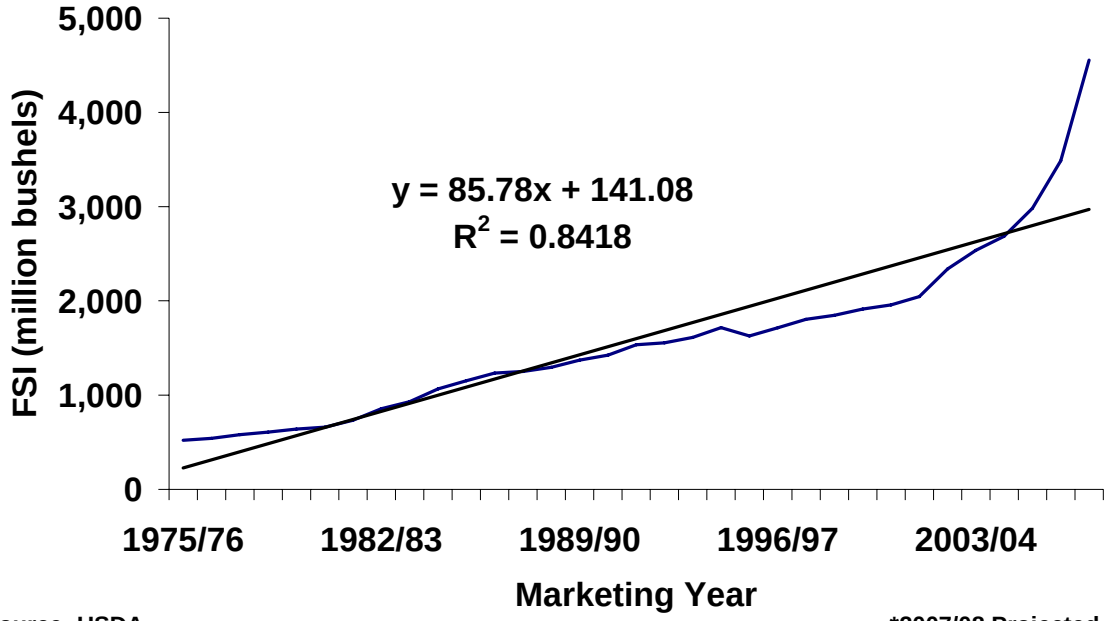
- Corn _____ for food and soft drinks
- Corn starch for construction uses
- _____ for fuel

- Cereals, snack foods

Ethanol use has grown rapidly in recent years

Other FSI uses flat at about _____ billion bushels over the last decade

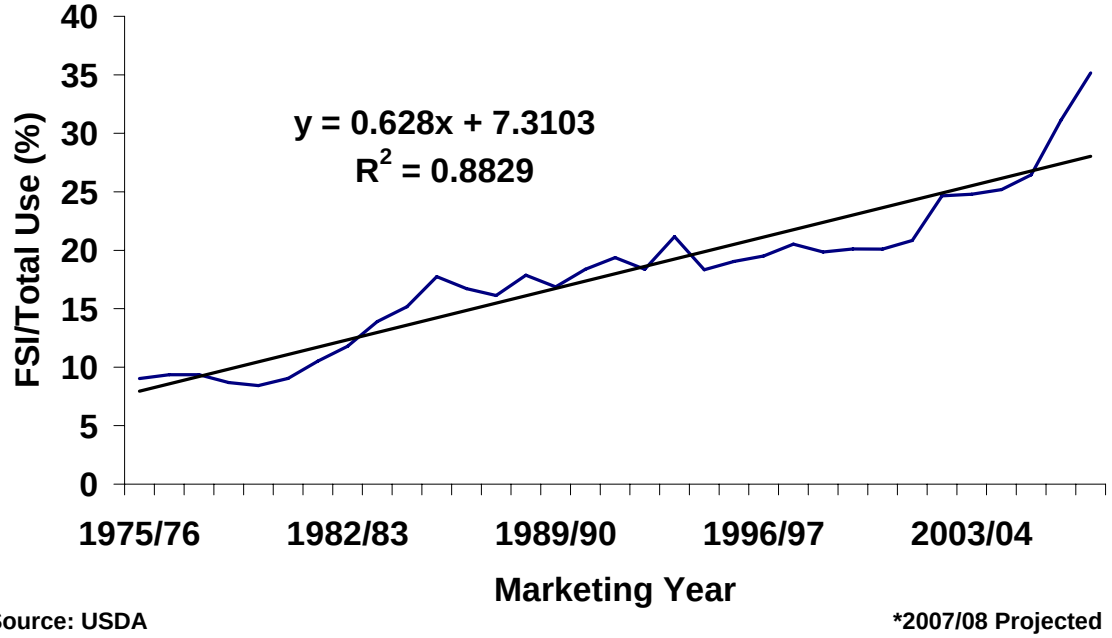
US Corn, Food, Seed and Industrial Use, 1975/76-2007/08*



Source: USDA

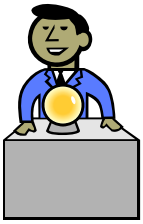
*2007/08 Projected

US Corn, Food, Seed and Industrial Share of Total Use, 1975/76-2007/08*



Source: USDA

*2007/08 Projected



Corn: Forecasting Food, Seed, and Industrial Use

Food component tends to grow at the rate of _____ growth

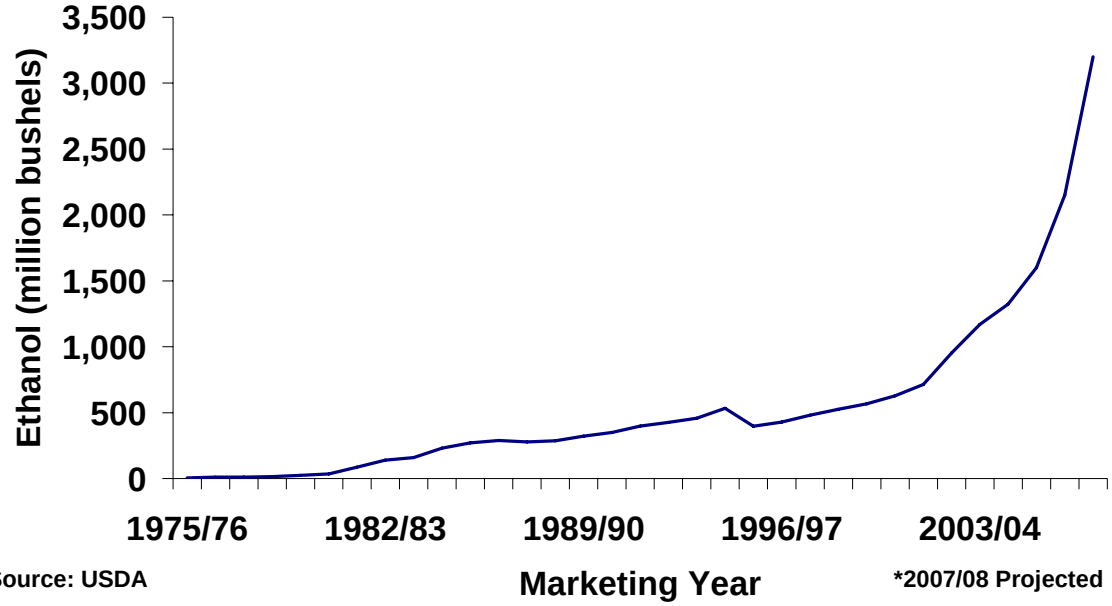
Relatively price _____

Corn sweetener use is critically affected by _____

Ethanol use is also driven by government policies:

- _____ blender tax credit
- _____ import tariff
- _____ for blending with unleaded gasoline and MTBE replacement

US Corn, Ethanol for Fuel Use, 1975/76-2007/08*



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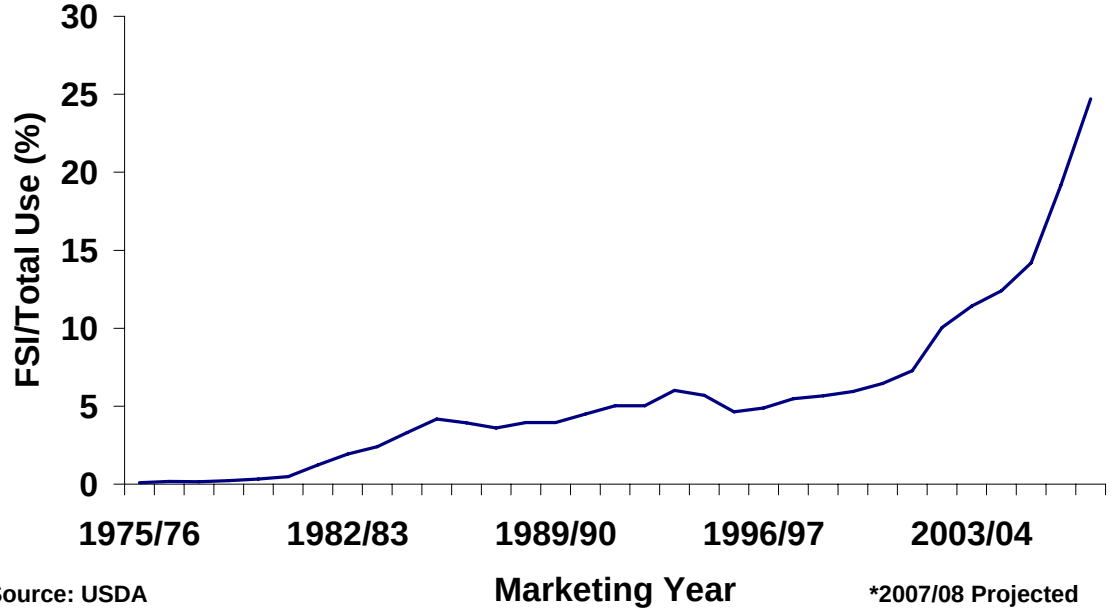
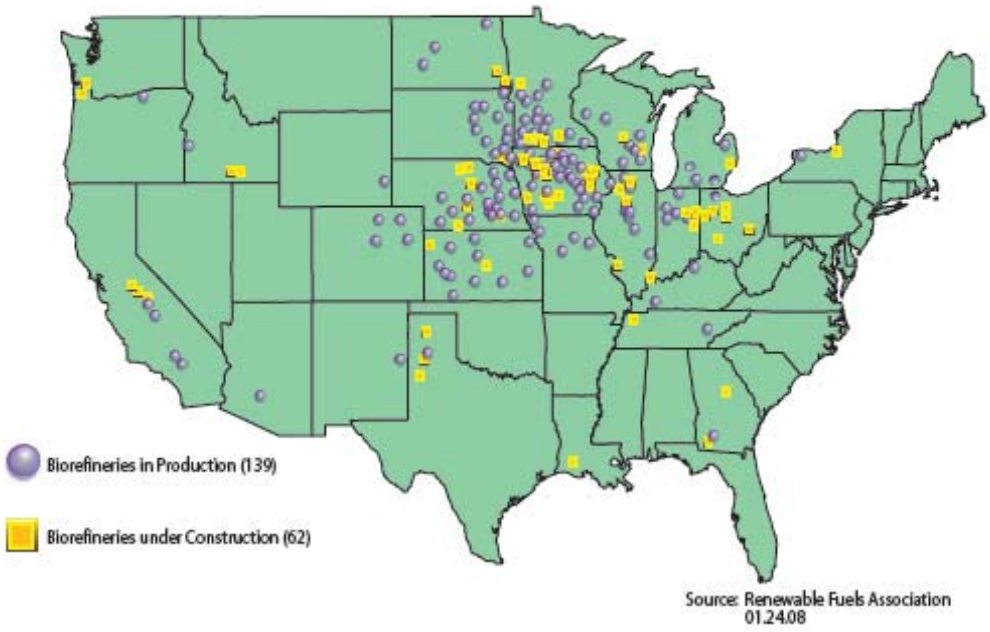
US Corn, Ethanol for Fuel Share of Total Use, 1975/76-2007/08*



Source: USDA

*2007/08 Projected

U.S. Ethanol Biorefinery Locations



Corn: Export Use

Little volume _____ in the last 25 years

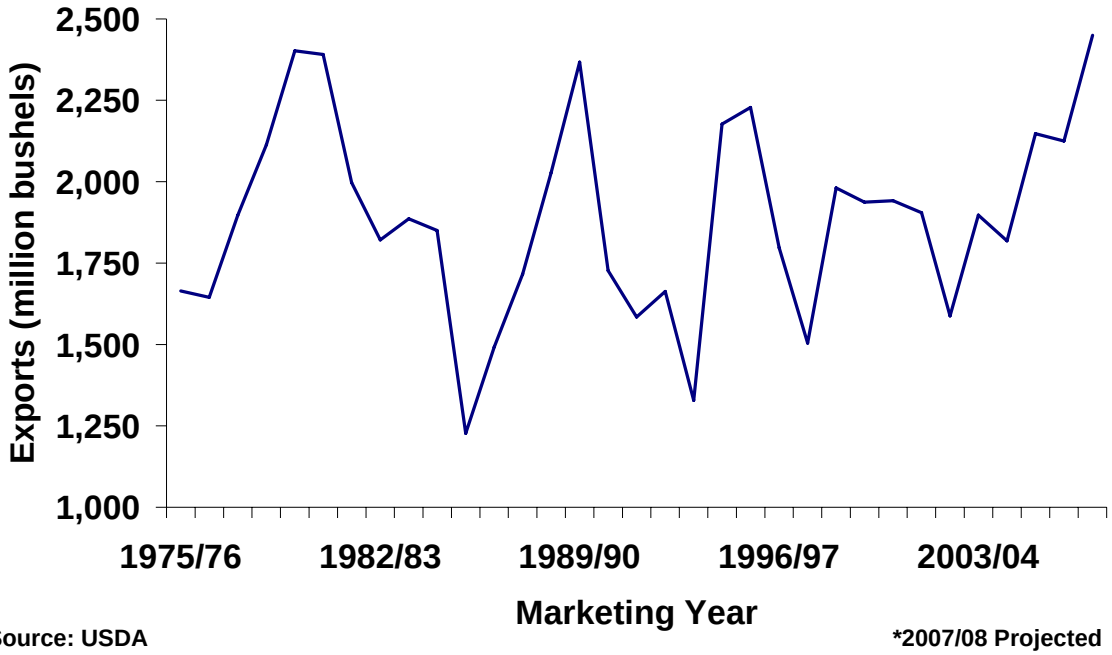
Substantial decline in relative importance as a use category

- About 30% of use in early 1970s
- About 20% of use currently

Largest export customers in 2006/07:

- _____ 28%
- _____ 16%
- _____ 8%
- _____ 7%

US Corn, Exports, 1975/76-2007/08*



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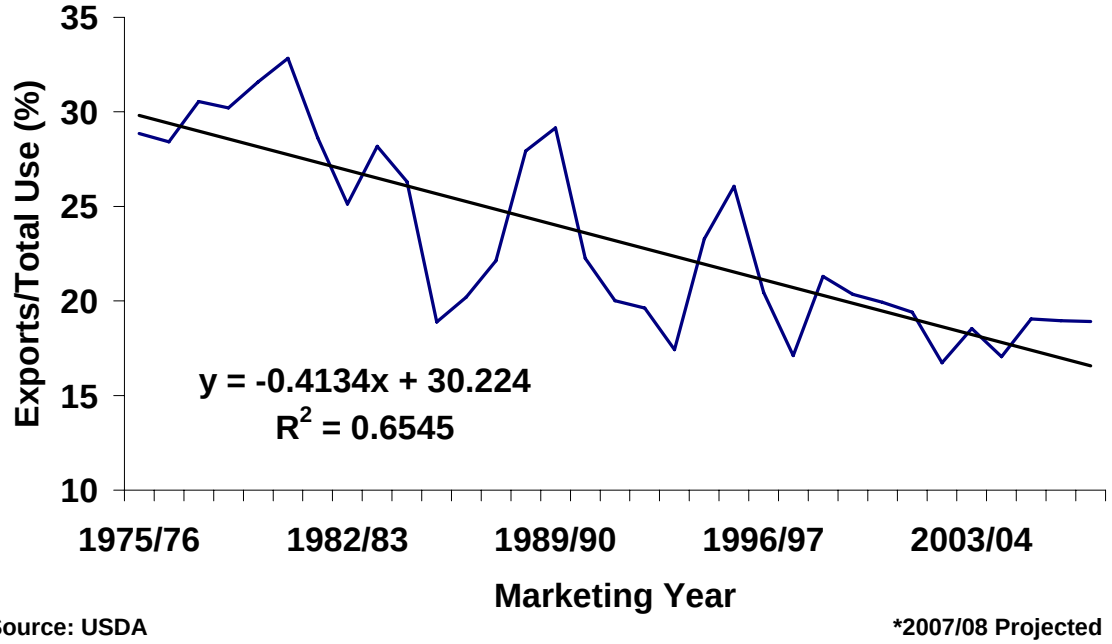
*2007/08 Projected

US Corn, Exports Share of Total Use, 1975/76-2007/08*



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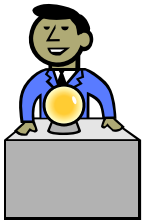


Corn: Forecasting Exports

Large _____ year-to-year and difficult to forecast

Factors to consider:

- Crop production in _____ and _____ countries
- _____ in _____ export countries
- Exchange _____
- Government export subsidy programs both in the US and other countries
- Economic _____
- _____ numbers outside the US

Corn: Domestic Feed and Residual Use

Historically largest component of corn use

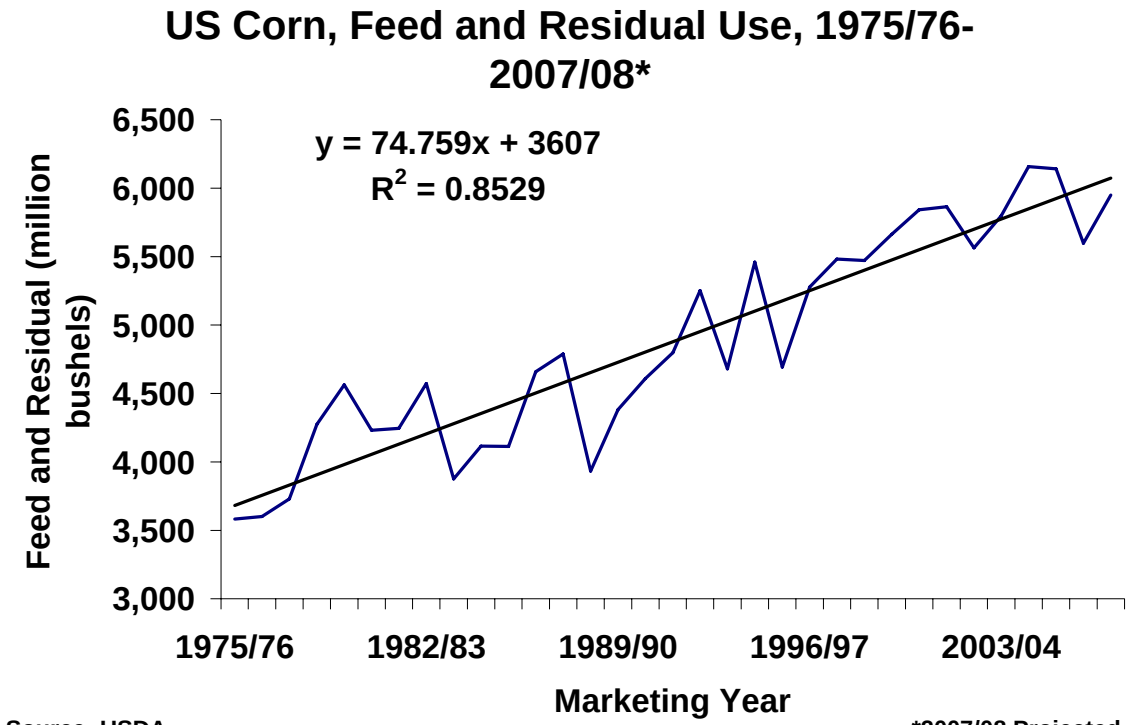
- Averaged about 60% of total corn consumption until recent years
- _____ driver of corn prices
- Largely dependent on the number of _____ _____

Residual use:

Wherever possible, use is _____ with _____ information sources

- Not all use can be cross-checked
- Leads to a category for _____ or _____ use
- Reflects _____ error in one or more use categories or in production estimates
- Lumped together with feed usage in corn balance sheet


Error



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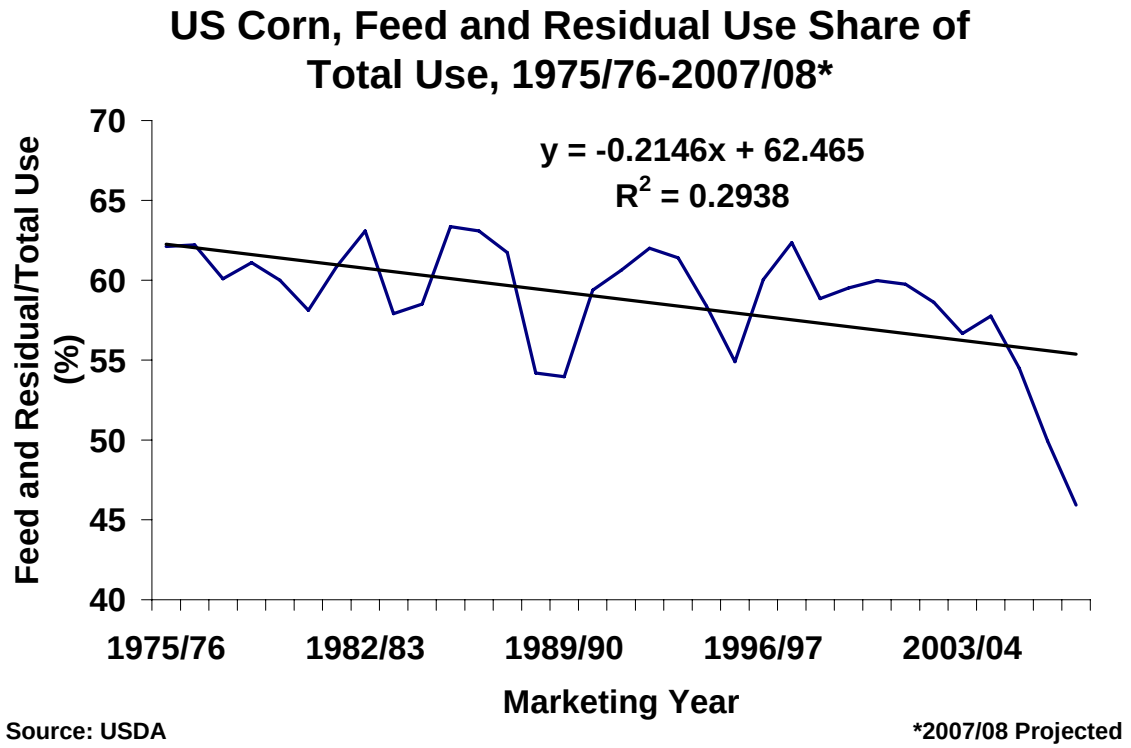

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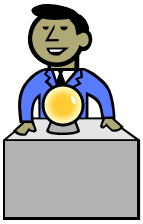


Corn: Forecasting Domestic Feed and Residual Use

Related directly to the number of beef, pork and poultry _____ on _____

Number of animals on feed is, in turn, related to _____ to livestock production

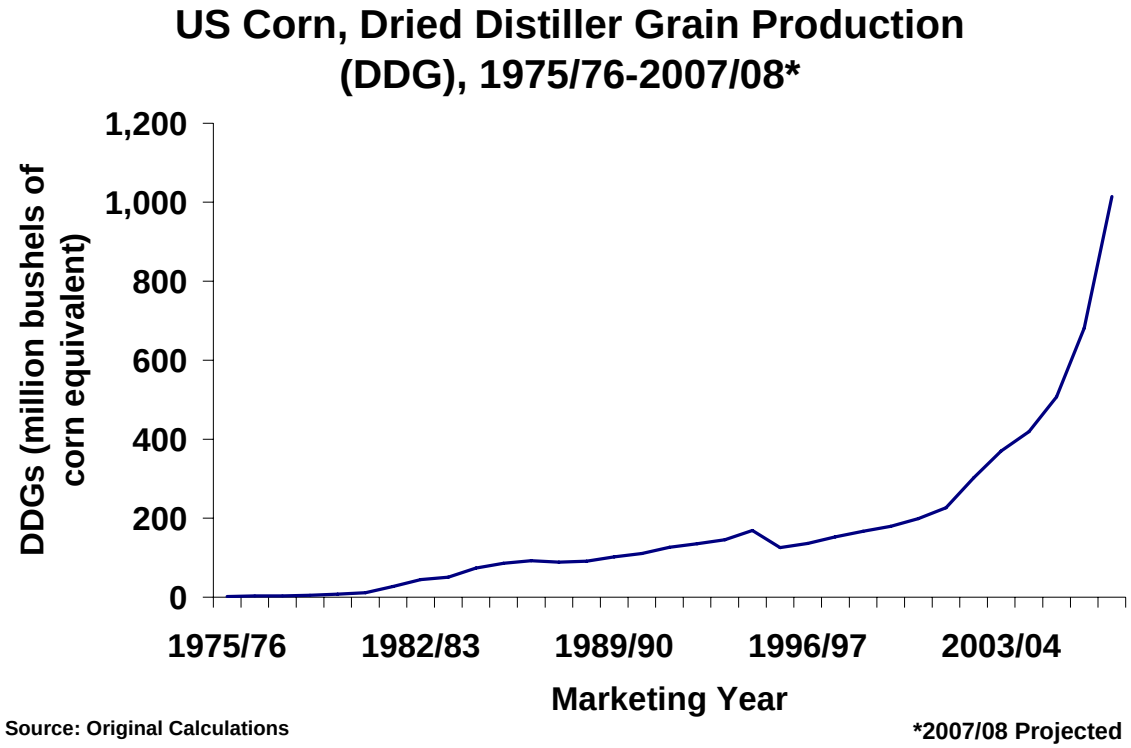
Profitability depends on:

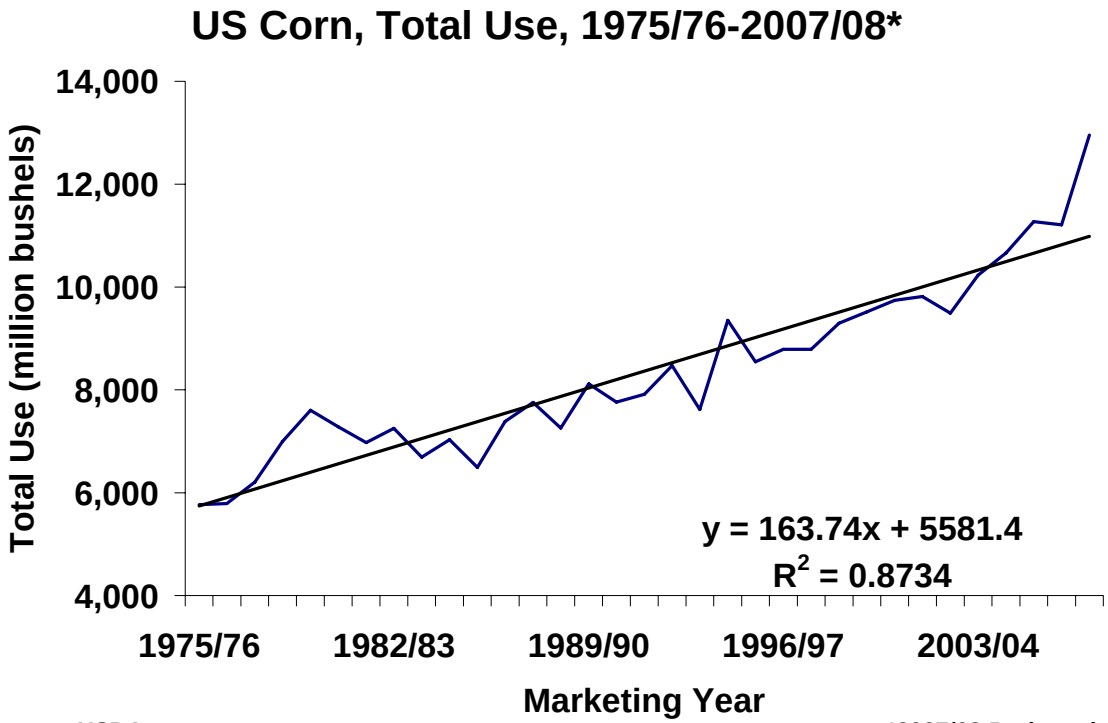
- _____ prices
- Price of _____ including corn
- Also have to account for relative price of feed inputs, such as sorghum and wheat

So, there is a _____ determination element to feed and residual use

- _____ in feed price effects due to biological lags in livestock production
- This lessens forecasting problems _____ a particular marketing year as livestock numbers are relatively fixed

A major new uncertainty is substitution of ethanol production by-products, _____ for corn in feed rations





Source: USDA

*2007/08 Projected

Soybeans: Domestic Soybean Crush

Largest component of soybean use

- Averages about _____ of total soybean consumption
- _____ driver of soybean prices

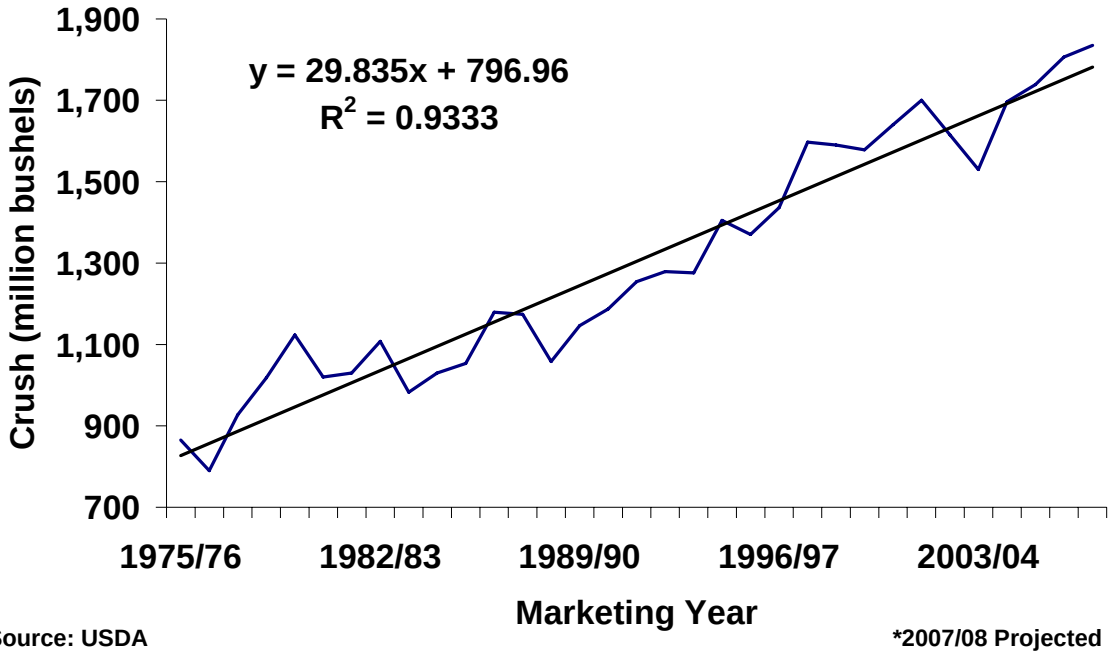
Soybeans are “crushed” into two components

- _____
- _____

A bushel (60 pounds) of crushed soybeans normally yields

- 48 pounds of meal
- 11 pounds of oil
- 1 pound of waste

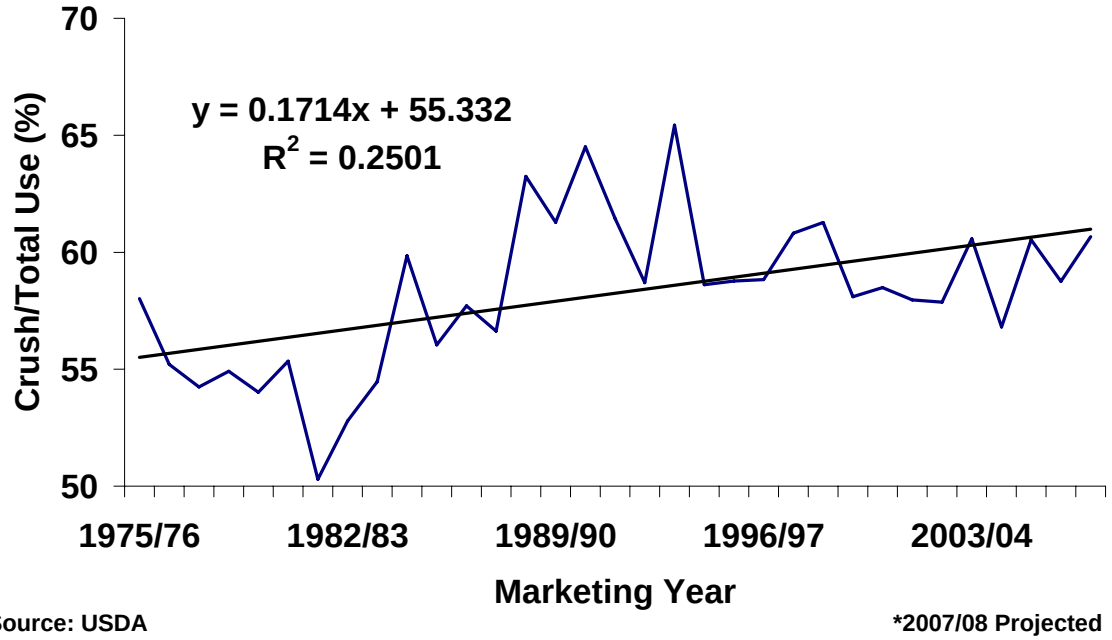
US Soybeans, Crush Use, 1975/76-20007/08*



Source: USDA

*2007/08 Projected

US Soybeans, Crush Share of Total Use, 1975/76-2007/08*



Source: USDA

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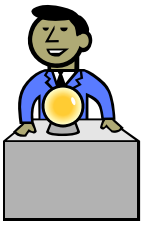


Soybeans: Forecasting Domestic Crush

Soybean crush tends to _____ at a fairly steady pace from year-to-year

Driven primarily by domestic demand for soybean oil and soybean meal

A good deal of complexity in the relationship between soybean, soybean oil and soybean meal demand

Also a number of products that are substitutes in demand

- _____ meal
- Peanut meal
- _____ oil
- Canola oil
- Fish oils

Soybeans: Exports

Some volume growth in the last 25 years

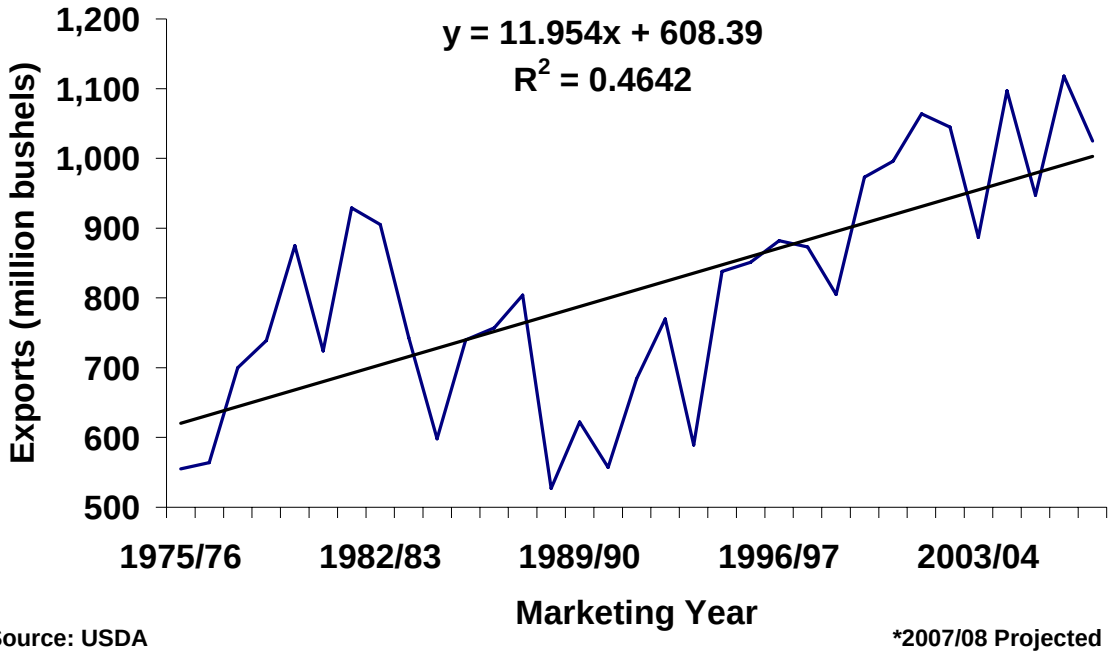
Modest _____ in relative importance as a use category

- About 40% of use in early 1970s
- About 35% of use currently

Largest export customers in 2005/06:

- _____ 38%
- _____ 14%
- _____ 12%
- _____ 8%

US Soybeans, Exports, 1975/76-2007/08*



Source: USDA

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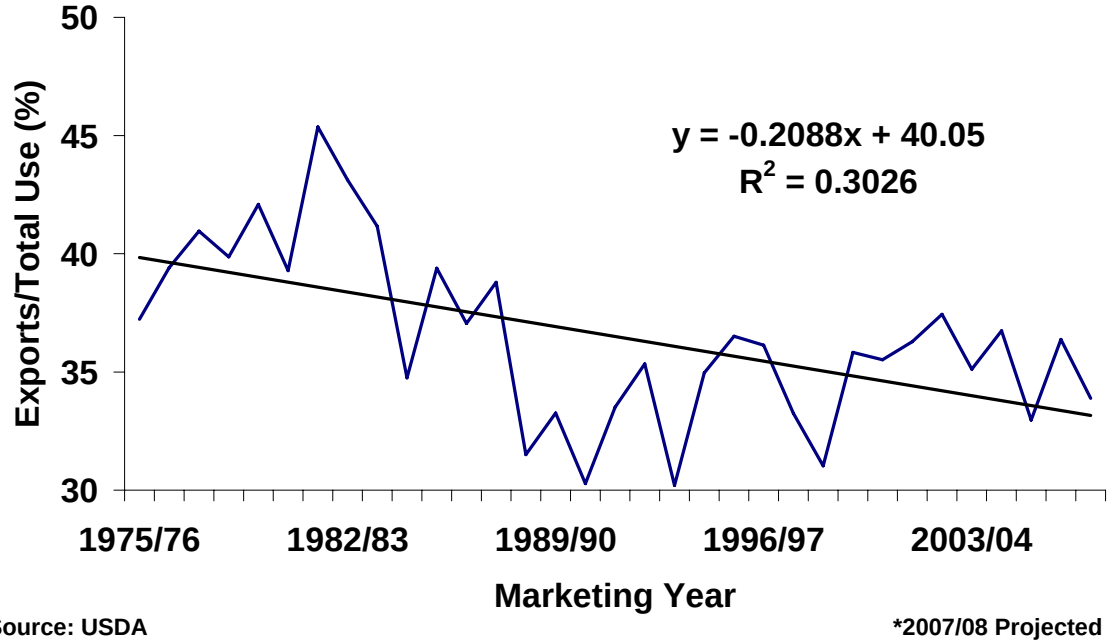
US Soybeans, Exports Share of Total Use, 1975/76-2007/08*



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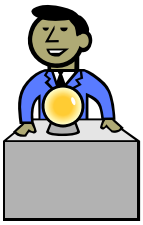


Soybeans: Forecasting Exports

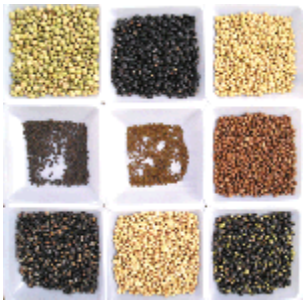
Large variation year-to-year

Factors to consider:

- Prices and available supplies in competing export countries
- _____
- Demand for soybean oil and soybean meal in _____ countries
- Government export _____ programs both in the US and other countries

_____ production prospects have become an especially important factor in determining US soybean exports

Important to note that export demand is driven by foreign demand for soybean oil and soybean meal; which, in turn, is often driven by _____ in the same foreign countries



Soybeans: Feed, Seed, and Residual Use

_____ component of soybean use

- Actually possible to feed soybeans directly to animals using on-farm processing procedure
- Seed use for domestic planting

Residual use:

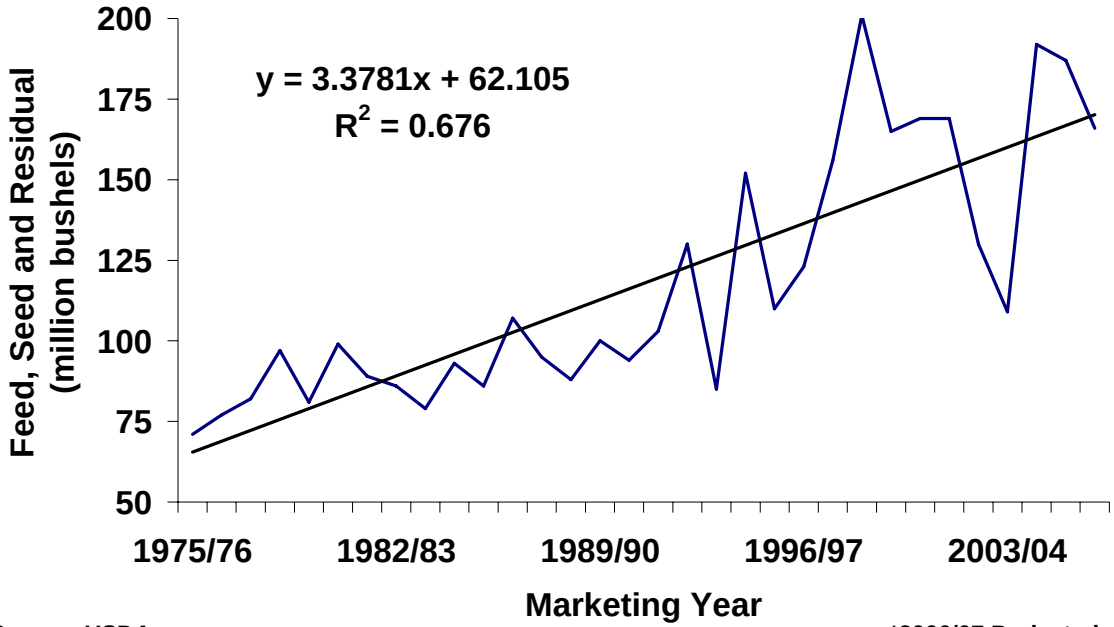
As noted earlier, where possible, consumption use is _____ with objective information source

- Export loadings at US ports
- Census Bureau oilseed crushings

Since not all soybean use can be cross-checked a category for “residual” or “unaccounted” use is required

Lumped together with _____ in soybean balance tables, as objective information is not available to cross-check

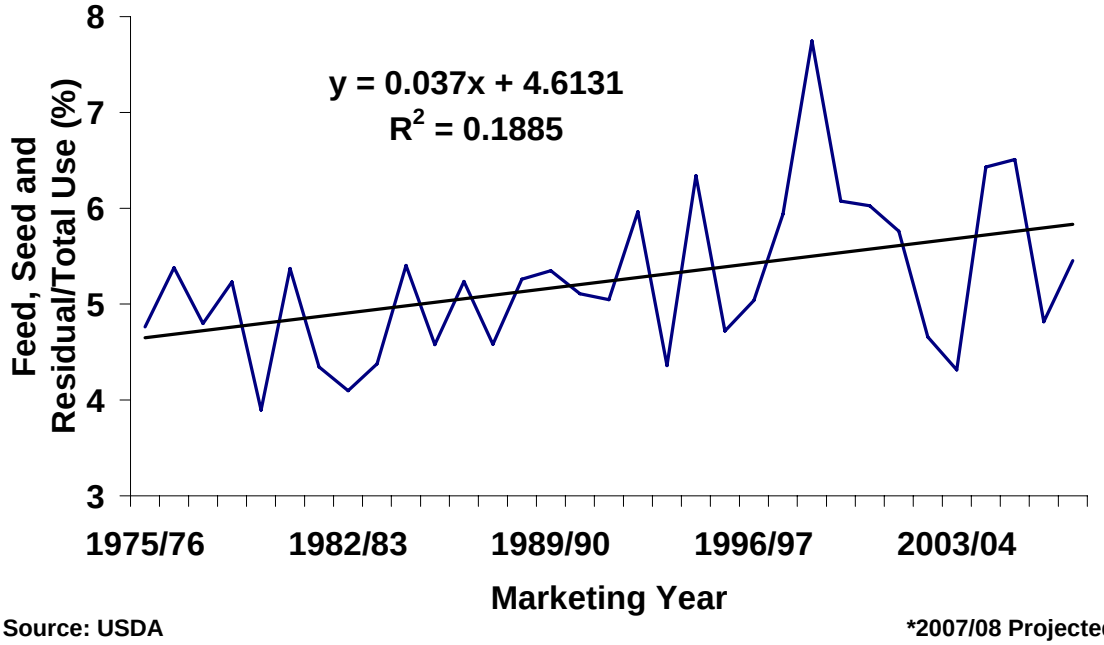
US Soybeans, Feed, Seed and Residual Use, 1975/76-2006/07*



Source: USDA

*2006/07 Projected

US Soybeans, Feed, Seed and Residual Share of Total Use, 1975/76-2007/08*



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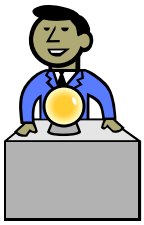
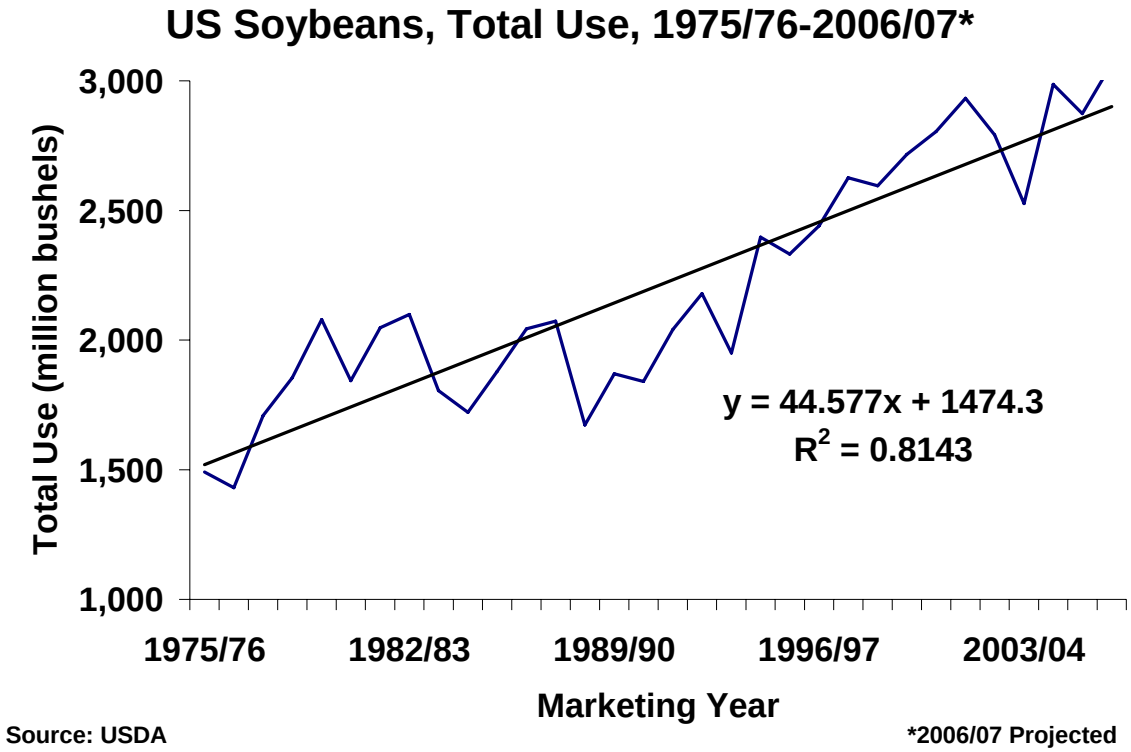


Soybeans: Forecasting Feed, Seed, and Residual Use

Quite constant at about ____ million bushels until the mid-1990s

More variable since then, with an average level of about ____ million bushels since 2003/04

Most analysts use a recent average to forecast FSR



Updating Use Estimates within the Marketing Year

As mentioned at the beginning of this lecture, use estimates are updated within the marketing year based on various reports, such as export sales and inspections _____, quarterly USDA _____ reports and USDA _____ inventory reports

Updating Exports for Corn and Soybeans

The USDA has an extensive _____ reporting system for crops

- The system has its roots in the unexpected purchase of large amounts of grain by the _____ in 1972

- The huge, unanticipated Soviet purchases of U.S. wheat and corn that year produced a sizable run-up in US food prices and depleted US reserve stocks (popularly known as the "Great Soviet Grain Robbery of 1972")

- Concern that large grain companies gained an advantage in this situation because they had _____ than the public had on future prices and grain trade trends

- Congress mandated export sales reporting in 1973 so that all parties involved in the production and export of U.S. grain have access to _____ export information

- Prior to the establishment of the export sales reporting system, it was impossible for the public to obtain information on exports until the products were actually shipped.

Under the export sales reporting system, U.S. _____ are required to report all _____ of certain commodities by 3:00 p.m. (Eastern time) on the business day after the sale is made

- US. exporters provide information on the _____ of their sales transactions, the ____ and class of commodity, the _____ of shipment, and the _____

- They also report any changes in previously reported information, such as cancellations and changes in destinations.

All daily sales reported to USDA by the 3:00 p.m. deadline are summarized and released to the general public through a Departmental press announcement at 9:00 a.m. on the next business day.

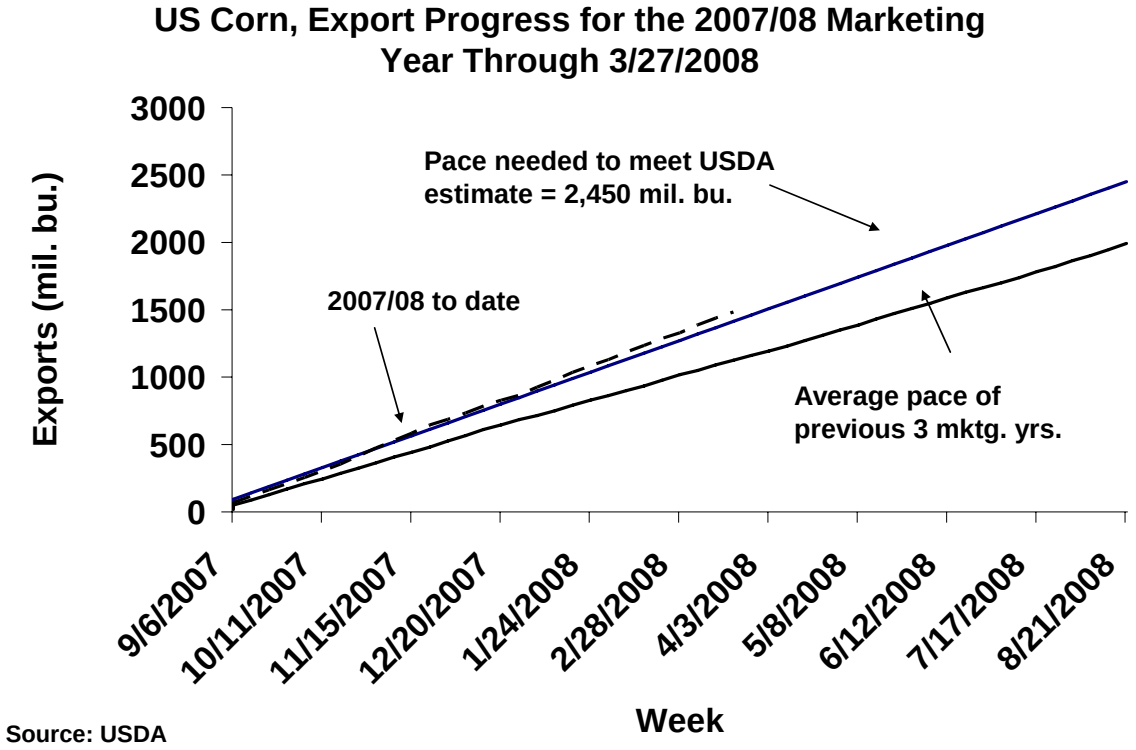
- A _____ of export activity, "U.S. Export Sales," is generally published every Thursday at 8:30 a.m. http://www.fas.usda.gov/export-sales/esrd1.html

- The Foreign Agricultural Service (FAS) within the USDA has responsibility for the export sales reporting system

FOR WEEK ENDING 3/24/2005

COMMODITY	CURRENT MARKETING YEAR						NEXT MARKETING YEAR	
	NET SALES	OUTSTANDING SALES		WEEKLY EXPORTS	ACCUMULATED EXPORTS		NET SALES	OUTSTANDING SALES
		CURRENT YEAR	YEAR AGO		CURRENT YEAR	YEAR AGO		
	THOUSAND METRIC TONS							
WHEAT								
HRW	128.8	1,436.30	2,003.70	268.7	7,996.80	10,468.60	0	244.3
SRW	22.1	226.4	788.9	37	2,983.30	3,145.40	4	12.4
HRS	108.5	1,297.50	1,255.70	153.7	6,519.20	5,497.70	29.9	164.4
WHITE	106.9	552.6	903.5	52.7	4,168.30	4,147.80	15.1	26.1
DURUM	0.2	97.7	122.5	12.2	568.5	873.8	0	5.2
TOTAL	366.4	3,610.60	5,074.30	524.4	22,236.00	24,133.40	49	452.3
BARLEY	0.6	119.8	61.8	20.8	270.2	389.7	0	0
CORN	1,158.90	7,635.80	8,449.50	813.8	25,709.40	28,136.20	30.5	141.1
SORGHUM	56.4	581.9	769.6	109.8	2,710.30	3,139.90	0	2.3
SOYBEANS	298.2	2,789.90	2,026.50	554.3	24,251.80	21,420.90	25.2	316.9
SOY MEAL	195.5	1,057.50	513.8	132.5	3,335.90	2,731.10	0.4	83.8
SOY OIL	6.9	52.3	48.4	5.2	299.6	137.2	0	0
RICE								
L G RGH	2.7	172.9	238.3	19.4	771.4	1,047.10	0	0
M S RGH	0	65	16.5	0	0.2	59.6	0	0
L G BRN	6.9	51.2	43.7	12.9	180.7	169.8	1.5	1.5
M&S BR	0.3	1.2	0.2	0.3	147.3	104.1	0	0
L G MLD	17.8	148.2	168	27.8	608.9	629.3	0	0
M S MLD	18	225.2	95	41.1	412.2	333.2	0	0
TOTAL	45.8	663.6	561.6	101.5	2,120.60	2,343.20	1.5	1.5
COTTON	THOUSAND RUNNING BALES							
UPLAND	155.7	4,282.90	4,451.10	377.4	6,468.30	7,149.40	9.2	604.9
PIMA	3.6	59.9	51.4	17.9	685.6	394.6	0	0.2

This data can be used to track the _____ of exports within the marketing year



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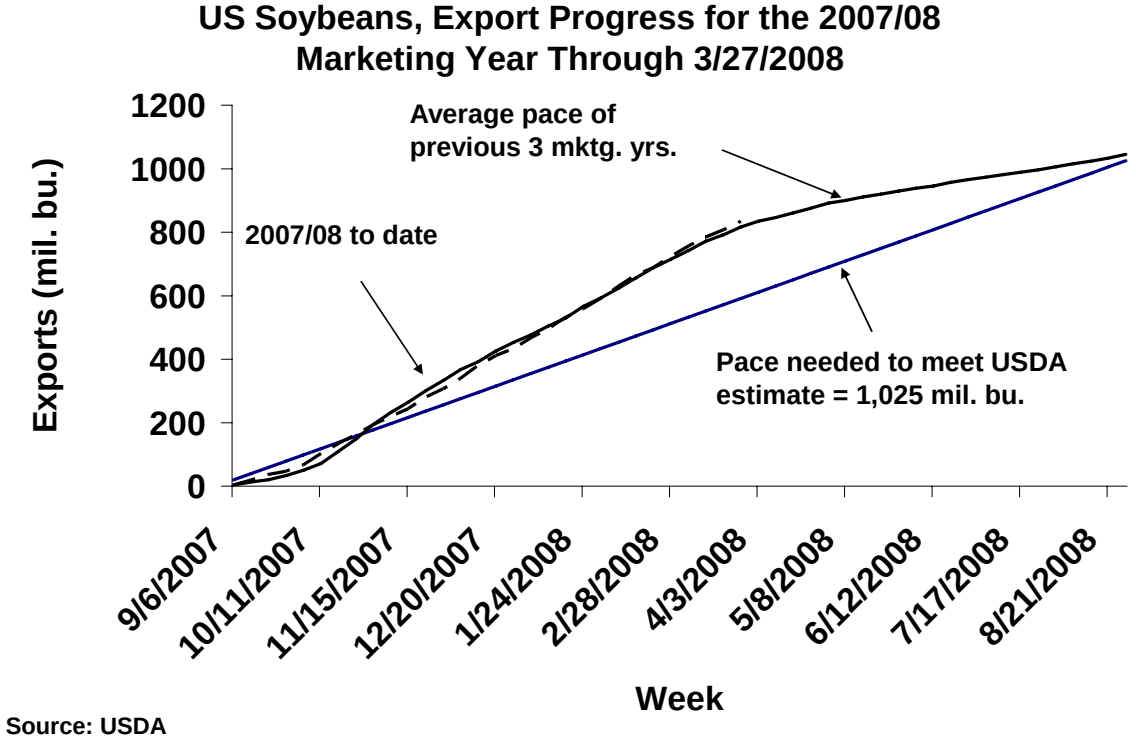


Source: USDA

Another agency within the USDA also produces weekly information on grain export activity

- The Federal Grain Inspection Service (FGIS) of the Grain Inspection Packers and Stockyards Division (GIPSA) of the USDA establishes the _____ for grain, which are used by sellers and buyers to communicate the _____ and _____ of grain bought and sold

- FGIS collects grain export volume data during _____ of grain loaded on ships for export

- The FGIS weekly Grains Export Inspections Report can be found at: http://www.ams.usda.gov/mnreports/WA_GR101.txt

WA_GR101
Washington, DC Mon Apr 4, 2005 USDA Market News

WEEKLY GRAIN INSPECTIONS

GRAINS INSPECTED AND/OR WEIGHED FOR EXPORT
- 1,000 BUSHELS -

GRAIN	WEEK ENDING 03/31/05	WEEK ENDING 03/24/05	WEEK ENDING 04/01/04	CURRENT MARKET YEAR TO DATE	PREVIOUS MARKET YEAR TO DATE
WHEAT	12,332	20,532	22,682	875,901	947,866
RYE	0	0	0	0	1
OATS	0	0	0	5	239
BARLEY	0	1,173	0	12,386	17,103
FLAXSEED	0	0	0	934	1,806
CORN	30,835	30,661	29,266	1,000,063	1,105,562
SORGHUM	2,706	3,132	3,848	89,505	112,663
SOYBEANS	16,689	17,513	7,188	888,425	768,251
SUNFLOWER	0	0	0	0	0
TOTAL	62,562	73,011	62,984	2,867,219	2,953,491

CROP MARKETING YEARS BEGIN JUNE 1 FOR WHEAT, RYE, OATS, BARLEY AND FLAXSEED;
SEPTEMBER 1 FOR CORN, SORGHUM, SOYBEANS AND SUNFLOWER SEEDS.

INCLUDES WATERWAY SHIPMENTS TO CANADA.

Note that FAS and FGIS grain volume data, while often quite similar, do not have to be the same

To further complicate matters, the _____ data on grain exports is not based on either of the previous USDA reports!

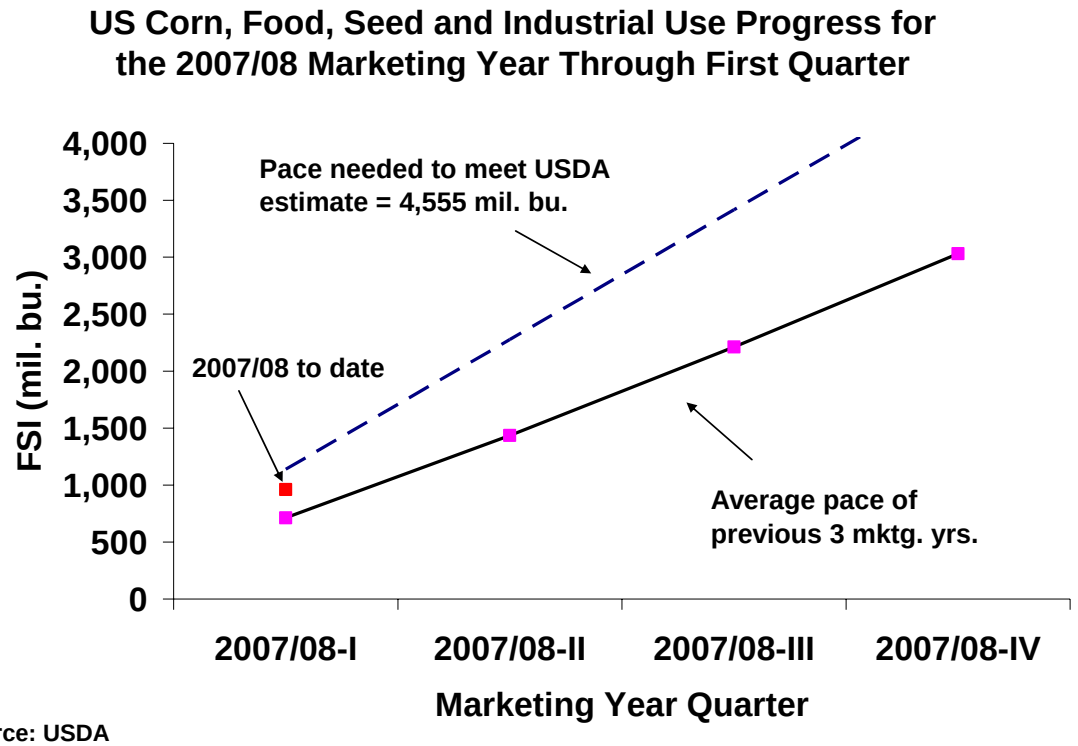
The _____ of the Department of Commerce produces the official statistics on grain exports

- Collected as part of ongoing industry reporting system
- Reported on a _____ basis
- However, reported with a _____
- The quantity data on grain exports is not reported on the web, but is usually reported by wire services as soon as it is released

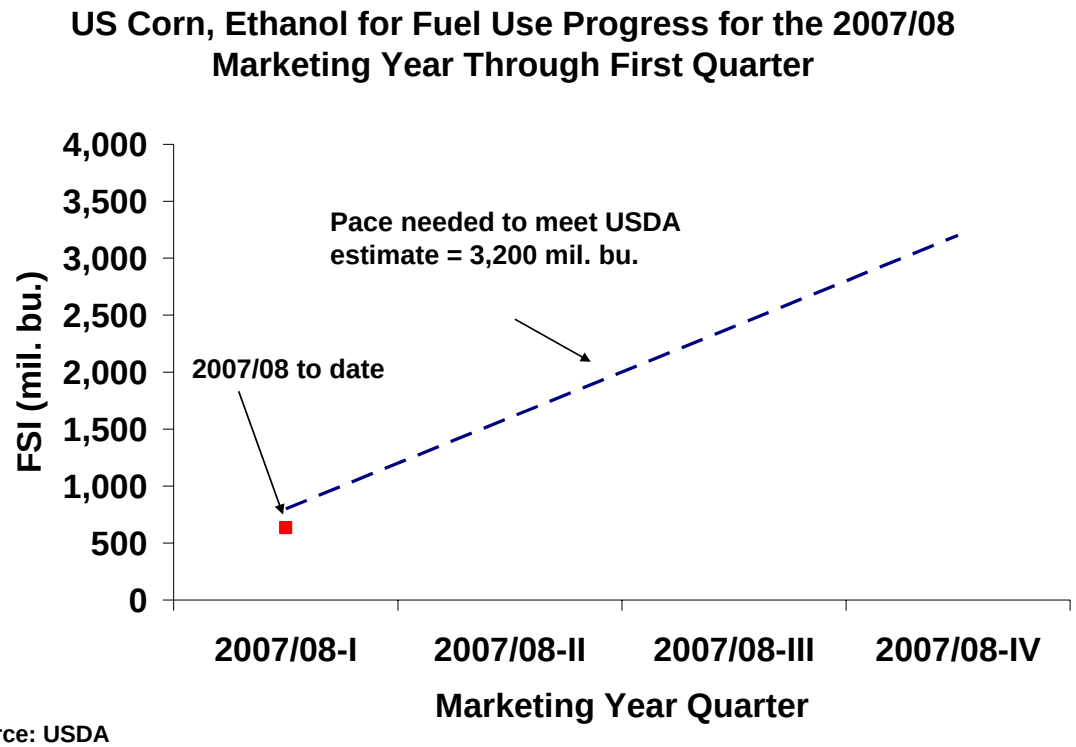
Updating Food, Seed and Industrial Use for Corn

Official statistics on FSI use for corn are reported quarterly by the Economic Research Service (ERS) of the USDA

This data can be found in the monthly *Feed Outlook* publication at: http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1273



Source: USDA

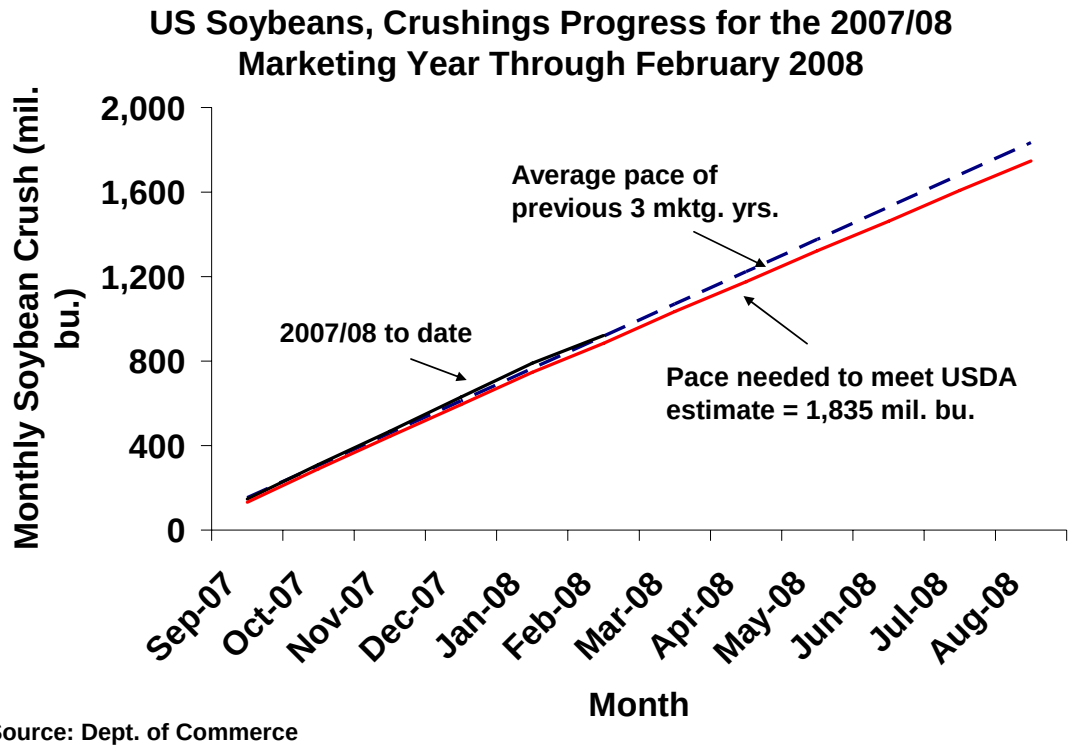

US Corn, Ethanol for Fuel Use Progress for the 2007/08 Marketing Year Through First Quarter
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
FSI (mil. bu.)
Pace needed to meet USDA estimate = 3,200 mil. bu.
2007/08 to date
2007/08-I
2007/08-II
2007/08-III
2007/08-IV
Marketing Year Quarter

Source: USDA

Updating Crush Use for Soybeans

Official statistics on soybean crushings are reported monthly by the US Census Bureau in the Department of Commerce

The report is entitled *Fats and Oils, Oilseed Crushings* and is available on the web at: http://www.census.gov/cir/www/311/m311j.html (Table 2 under the heading "Crushed or Used")



Source: Dept. of Commerce

Updating Use via Quarterly Stocks

Quarterly stocks estimates are another important means of assessing the _____ within a marketing year

The USDA estimates the level of stocks on four dates during the year:

- _____ 1
- _____ 1
- _____ 1
- _____ 1

The stocks reports are released at the end of each of the above calendar months

Each stock estimate can be used to assess whether the rate of usage has been _____ than expected

December 1:

Available supply for Sep-Nov quarter =
Sep 1 stocks + production + imports =

Available supply for Sep-Nov quarter – Dec 1 stocks
= Total use for Sep-Nov quarter

March 1:

Available supply for Dec-Feb quarter =
Sep 1 stocks + production + imports
-Total use for Sep-Nov quarter

Available supply for Dec-Feb quarter – Mar 1 stock
= Total use for Dec-Feb quarter

June 1:

Available supply for Mar-May quarter =
Sep 1 stocks + production + imports
-Total use for Sep-Nov quarter
-Total use for Dec-Feb quarter

Available supply for Mar-May quarter – Jun 1 stock
= Total use for Mar-May quarter

September 1:

Available supply for Jun-Aug quarter =
Sep 1 stocks + production + imports
-Total use for Sep-Nov quarter
-Total use for Dec-Feb quarter
-Total use for Mar-May quarter

Available supply for Jun-Aug quarter – Sep 1 stock
= Total use for Jun-Aug quarter

The _____ usage for each quarter can be compared to the _____ in the latest WASDE balance sheet to see if usage is evolving at the pace expected

_____ of each quarter's usage to total usage are helpful in assessing whether the pace is fast or slow

Quarterly stocks estimates are also an important means of assessing _____ for corn during the marketing year

The only balance sheet categories that _____ be monitored on an ongoing basis during the marketing year are:

- Corn feed and residual use
- Soybean feed, seed and residual use

Since corn feed and residual use is about ___ of total use, it is _____ to monitor its pace during the marketing year

This is not as important for soybean feed, seed and residual use, which is only about 5% of total use

Once _____ for a given quarter is determined, the level of feed and residual use can be _____ by the following simple formula:

Total use for a quarter (computed)
- Exports (known)
- FSI (known)
= Feed and residual use

Once, again _____ of feed and residual use for a given quarter to total usage can be used to assess whether the pace feed and residual use is _____ _____

Updating Use Based on Livestock Inventories

Livestock inventories are important determinants of corn feed and residual use and soybean crush use

The _____ of animals on feed is tracked by several USDA reports within the marketing year

- Monthly *Hogs and Pigs Reports*
- Monthly Cattle on Feed Reports
- Monthly *Broiler Hatchings Reports*

As these reports are released, feed and crush use estimates can be _____

One problem is that inventory estimates are reported _____ for different livestock _____

However, _____ species consume quite _____ amounts of corn and soybean meal in feeding rations

- There is a need to _____ different species according to the amount of feed that one animal consumes

- This led to the development of the concept of a _____

The base for computing grain consuming animal units is the total level of grain concentrate fed to a _____ for the base period of 1969-1971, which equals _____

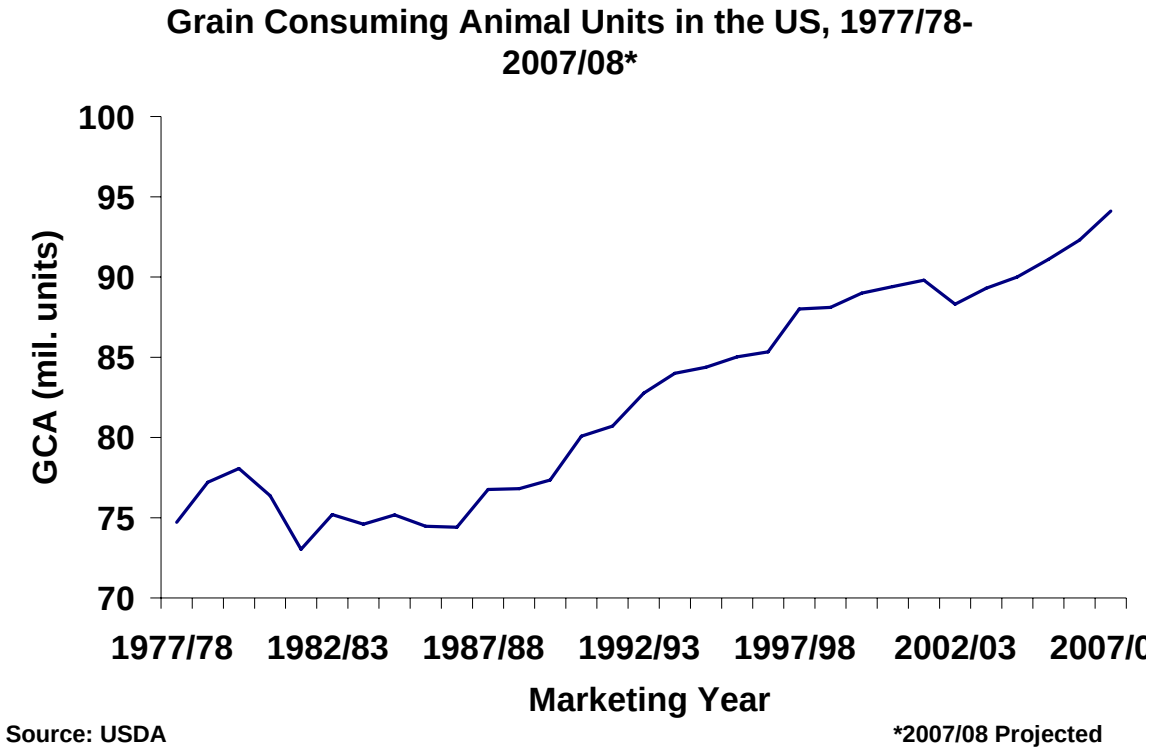
The number of pounds of grain concentrate consumed by another species is divided by 4,293 pounds to determine the _____

	Grain Concetrate Fed Per Animal	Weighting Factor
	---pounds---	
Milk Cows	4,293	1
Other Dairy Cattle	910	0.212
Cattle Placed on Feed	3,311	0.771
Other Beef Cattle	289	0.067
Sheep	112	0.026
Hogs Fed During Year	1,127	0.263
Hens and Pullets	94	0.022
Chickens Raised	30	0.007
Broilers	9.2	0.002
Turkeys	92	0.021
Horses and Mules	1,006	0.234

Source: Allen, G.C. and E.F. Hodge. “Livestock-Feed Relationships—National and State.” Statistical Bulletin No. 530, Economic Research Service, U.S. Department of Agriculture, June 1974

Next, the _____ of animals in each category for a given year is _____ by the weighting factor

Finally, the weighted numbers are _____ to derive the _____ of livestock in the US in grain-consuming animal _____



GCA data can be found in the monthly *Feed Outlook* publication at: http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1273