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# GAIN Report

Global Agricultural Information Network

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## Guatemala

### Grain and Feed Annual

## Guatemala's Corn Sector Struggles with Contraband and Low Prices

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**Report Highlights:**

Production for Marketing Year (MY) 2020 is forecast at 2.02 million metric tons (MT), one percent above MY2019: a slight increase in area but yields continue at a very low 2.05 MT per hectare (Ha). Contraband corn is estimated at 300,000 MT. Commercial corn accounts for 40% of total area harvested, while 60% is devoted to subsistence agriculture. Guatemala continues to be a net importer of yellow corn and keeps filling its CAFTA-DR quota for white corn.

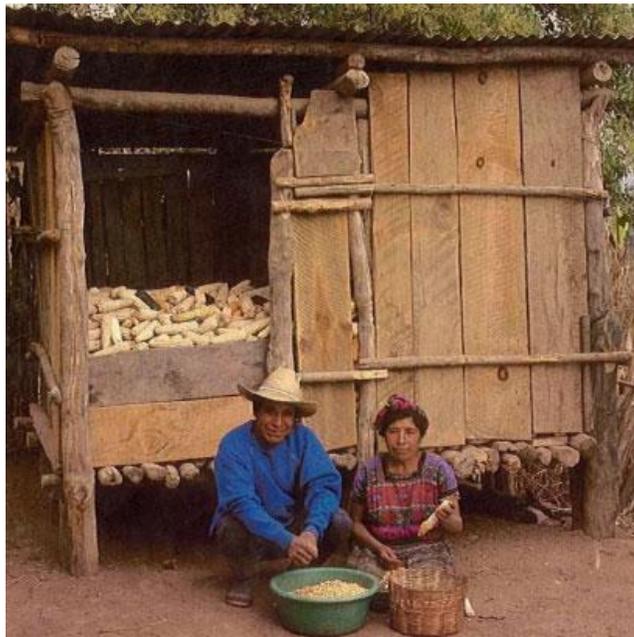
## Commodities:

Corn

## Production:

Production for MY2020 (July-June) is forecast at 2.02 million metric tons, one percent above MY2019. Production area for MY2020 is forecast at 986,000 hectares, one percent above MY2019. MY2019 production estimates were revised up 10 percent based on new data from the November 2018 agricultural survey. Yields continue at a very low 2 MT/Ha, (compared to over 10 MT/Ha in the United States). Subsistence corn farming increased from 58 percent of the total planted area to 60 percent. Subsistence farming yields may reach 1.1 MT/Ha, and is concentrated in the most impoverished areas in Guatemala, largely in the Western Highlands. Subsistence farming relies exclusively on rain, local corn seed, little to no agricultural inputs and manual sowing, harvest, and artisanal storage (see Figure 1).

Figure 1  
Artisanal corn storage in Guatemala, under subsistence agriculture



*Source: Ministry of Agriculture of Guatemala, 2018*

FAS/Guatemala has updated corn production estimates based on the recent Government of Guatemala agricultural survey for basic grains, including corn, from November 2018. Estimating corn area and yields continue to be a challenge due to the significant representation of small farmers, which in 2011 accounted for roughly 1 million farmers. Consumption data is also challenging to estimate considering the smuggled corn from Mexico. According to the National Grains Association (ANAGRAB), the contraband Mexican corn accounts for up to 300,000 MT, almost 16 percent of the national production and 10 percent of consumption. The Ministry of Agriculture has no official reports related to contraband corn.

Local seed varieties can potentially produce yields comparable to hybrid seed but require precise seed selection and a strong fertilizer program, which is not the general practice. Land parcels in the highlands average between 0.2 to 0.5 hectares, of which 80 percent is owned and 20 percent is rented. The production cycle runs from May--when the rainy season starts in the Guatemala City valley--to December and can extend into January, taking as long as 10 months from planting to harvest. It is a common practice in the highlands to double crop corn with black beans, squash, and other crops. Black beans climb around the corn stalk while the corn dries. (The stalk is folded downward to avoid excess moisture.)

Figure 2  
Intercropping of maize with black beans in Guatemala



*Source: Institute of Agricultural Science and Technology –ICTA- gallery, 2018*

Corn occupies at least 40 percent of total agricultural land in Guatemala. Yields in commercial areas (altitudes below 1,000 meters), which all use hybrid corn and some have mechanized planting and harvesting, may reach up to 7.6 MT/Ha, close to the lower yields reported in the United States. These commercial areas are mostly concentrated in the northern region of Guatemala, considered the breadbasket of the country. The highly productive region of Ixcán and Las Cruces, in the Quiché and Peten departments, are recognized as the most important commercial corn areas. Commercial corn production in this area is mechanized, as shown in Figure 3.

Figure 3

## Mechanized corn production in Northern Guatemala



*Source: ANAGRAB, 2019*

The area devoted to commercial corn production is 394,400 hectares. Commercial areas can produce up to three harvests per year, but the majority of farmers plan for two harvests. Average size for commercial farms is 70 hectares, but some big farms may plant up to 140 hectares of corn. Commercial corn is also produced on the south coast of Guatemala, mostly in La Maquina in Suchitepequez, where irrigated corn is common, as shown in Figure 4.

Figure 4  
Corn production with drip irrigation in Southern Guatemala



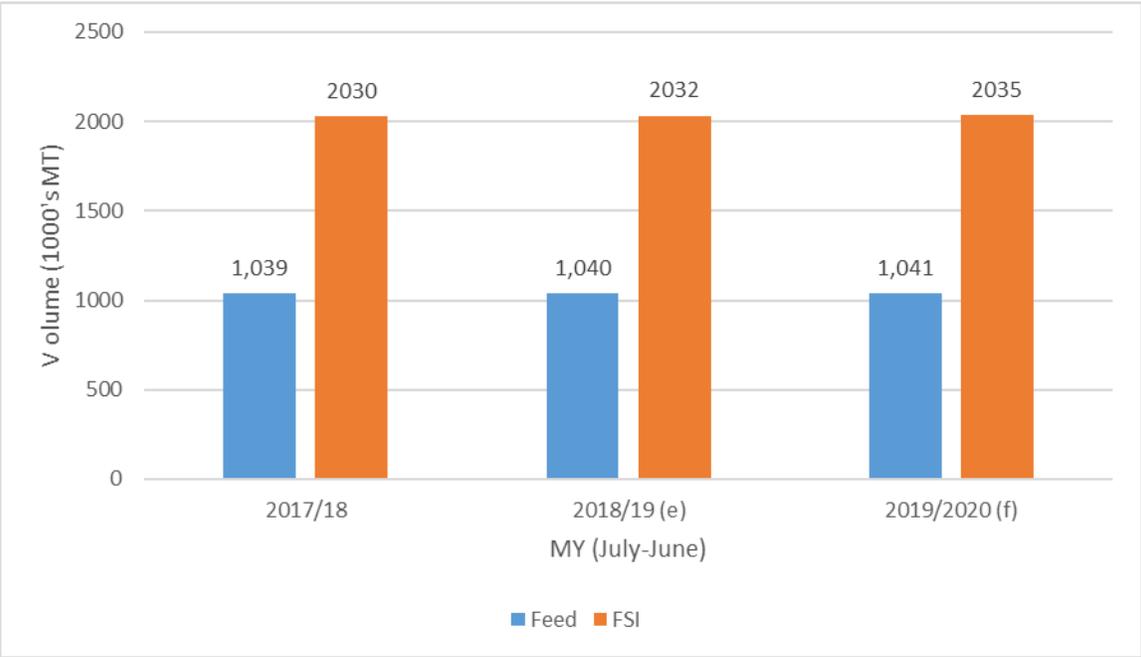
*Source: ANAGRAB, 2019*

Corn production in Guatemala is divided into three planting seasons, depending on the rainy season patterns in the area. The first harvest represents 64 percent of total harvest, and corresponds to the July-October season. The second harvest accounts for 27 percent of the national harvest, concentrated in the November-December season. The last harvest corresponds to the February-April season, representing roughly 9 percent of the total.

**Consumption:**

Graph 1 shows Guatemala’s corn consumption. Feed for MY2020 represents about 34 percent of total corn consumption, two percent above Post estimate for MY2019. For MY2020, corn for feed is forecast at 1.041 million MT, three percent down from the previous Post estimate. Food, Seed, and Industrial (FSI), similarly, is forecast at over 2 million MT for MY2020, virtually unchanged from the MY2018 estimate. Overall, revision of Post numbers corresponds to reductions in feed numbers, accompanied by corresponding increases and adjustments for FSI.

**Graph 1: Guatemala Corn Consumption (MY2018-MY2020)**



Source: MAGA’s Situational Report for White Corn, 2017, MAGA’s Supply and Utilization Balance Sheet for 2016/2017, and Post own estimates

Consumption for corn may still be larger than Post’s estimate, as Mexico’s weak peso has resulted in sustained contraband of white corn to Guatemala since 2015. The private sector and producer associations, including ANAGRAB, participate in the Observatory against Contraband in Guatemala. According to the observatory, the national agricultural market has been negatively impacted by contraband, representing between 12 and 20 percent of national sales, roughly estimated in 300,000 MT. ANAGRAB reported that 50 trucks and trailers were detected in 10 days of observation at the border, moving around 7,300 MT in contraband corn. This estimate comes from the five blind spots studied out of the 148 existing blind spots in the Guatemala-Mexico border.

### Food, Seed, and Industrial (FSI) Consumption

Annual corn consumption is estimated at 174 kilograms per capita, mostly consumed in the form of tortillas. At least 95 percent of corn consumption in Guatemala is in the form of tortillas, as shown in figure 5. Studies reveal median maize intake of 483 grams per day. Corn dough or corn flour for tortillas undergoes a process called “nixtamalization” that consists of soaking corn kernels in lime. By law (Presidential Decree 298-2015)<sup>1</sup> corn flour in Guatemala must be fortified with Vitamin B Complex (B1, B2, B3, B9, B12), iron, and zinc. Commercial corn flour complies with international food safety standards for mycotoxins. Unfortunately, non-commercial corn processed as dough for tortillas may be highly contaminated with mycotoxins, up to 10 times the Codex-approved levels<sup>2</sup>. Mycotoxins represent serious health concerns, and are especially harmful to children under five years old. Industrial corn flour production accounts for 50,000 MT of white corn, which is the predominant production.

Figure 5  
Maize tortillas in Guatemala – blue corn tortillas are very popular,  
but can only be found in the highlands



*Source: Prensa Libre Newspaper archive, 2018*

Five percent of the white corn consumption in Guatemala is consumed fresh and in processed foods. In addition to corn flour, white corn is used to produce whole cereals and corn-soy blends, mostly consumed as porridge. The local industry has a milling capacity of 3,000-3,500 MT per month, and a storage capacity of 37,000 MT.

<sup>1</sup> <http://incap.int/index.php/es/noticias/1171-guatemala-cuenta-con-acuerdo-gubernativo-sobre-la-fortificacion-conmicronutrientes-de-la-harina-de-maiz-nixtamalizado>

<sup>2</sup> <https://academic.oup.com/jn/article/137/12/2723/4750747>, <https://academic.oup.com/jn/article/134/4/711/4757175>, <https://www.wageningenacademic.com/doi/abs/10.3920/WMJ2014.1736>, [https://www.researchgate.net/publication/255717409\\_Fumonisin\\_biomarkers\\_in\\_maize\\_eaters\\_and\\_implications\\_for\\_human\\_disease](https://www.researchgate.net/publication/255717409_Fumonisin_biomarkers_in_maize_eaters_and_implications_for_human_disease), <https://www.ncbi.nlm.nih.gov/pubmed/24375966>, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3820424/>, <https://www.ncbi.nlm.nih.gov/pubmed/26264677>, <https://www.sciencedirect.com/science/article/pii/S2214750019300496?via%3Dihub>

Guatemala produces seed corn. Seed corn for non-commercial production is obtained directly from the previous harvest. Corn in Guatemala has no other industrial use, aside for food and feed. Guatemala does not use corn for ethanol or energy production.

**Feed and Residual Consumption**

As shown in Graph 1, feed accounts for roughly 34 percent of total corn consumption in Guatemala. The feed industry in Guatemala has a flat storage capacity of 92,000 MT for yellow corn. Yellow corn is combined with soybean meal for pork and poultry feed. Formula proportions of corn and soybean meal vary depending on commodity prices. Currently, mainly because of low prices of corn, the feed industry is not using significant volumes of corn gluten meal or distiller's dried grains with soluble (DDGS).

The Guatemalan feed industry is highly sophisticated and supports one of the largest poultry industries in Central America. Guatemala’s poultry industry has a very competitive feed conversion ratio in production. Poultry consumption accounts for 65 percent of meat protein consumption in Guatemala. Annual per capita consumption for 2018 increased 14 percent from 162 to 189 eggs, according to the National Poultry Association – ANAVI. These numbers also result from the past year’s food security interventions in which both the international cooperation and the Government of Guatemala have provided food insecure families with hens for household production. In addition, Guatemala’s national poultry production is around 194 million birds, or 318 million kilograms. Average retail price for broiler meat is US\$1.28 per pound, compared to US\$1.60 per pound for pork and US\$1.92 per pound for beef.

**Trade:**

Guatemala imports 36 percent of its total corn consumption. Trade year (TY) data is reported on an October-September basis. As shown in the Production, Supply, and Distribution (PS&D) Table at the end of the report, imports for TY2018 were revised up two percent from the previous estimate, which is an 8 percent increase from TY2017. Corn imports for TY2018 were 1.12 million MT, mostly yellow corn. The U.S. market share dropped five percent, while Brazil’s share slightly increased to 12 percent, resulting from lower prices for Brazil’s corn. Guatemala is a net corn importer, but exported roughly 2,784 MT of white corn to El Salvador, the major export market for Guatemala.

**Tariff Tables**

The Government of Guatemala has formally protected white corn in commercial trade agreements. Table 1 shows the tariffs for white corn and yellow corn. Outside of any free trade agreement, Guatemala imposes a 15 percent tariff on yellow corn imports and a 20 percent tariff on white corn. Countries benefiting most from increased access to Guatemala’s yellow corn import market are the United States, Mexico, other Central American countries, the Dominican Republic, and Belize. White corn is duty free with the rest of the Central American countries and the Dominican Republic, while a tariff-rate-quota (TRQ) was established for the United States.

**Table 1 Guatemala Import Tariffs for Corn, with and without Free Trade Agreements**

Code	Central America (CHS) base	CAFTA -DR (U.S.)	FTA Taiwan	FTA Mexico	FTA Central America and DR	FTA Colombia	FTA Chile	EU – Association Agreement	panama	PA - Cuba	PA - Belize	PA - Salvador
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<b>Yellow corn</b> 1005.9 0.2	15%	0%	11.7%	0/15	0%	15%	15%	15%	18.7%*	15%	0/15	15%
<b>White corn</b> 1005.9 0.3	20%	0/20*	6.7%	20%	0%	20%	20%	20%	10.7%	20%	20%	20%

Note: CHS – Central American Harmonized System, CAFTA-DR – U.S., Dominican Republic and Central America Free Trade Agreement, FTA – Free Trade Agreement, PA – Partial Agreement, \* means out-of-quota tariff Source: Central American Import Tariffs, SAT, Guatemala

For the United States, the TRQ established for white corn increases annually by 400 MT into perpetuity, with a 25,600 MT quota for CY2019 and a 20% out-of-quota tariff, as shown in Table 2. The TRQ for yellow corn phased out completely at the end of 2014 and U.S. yellow corn enters Guatemala duty free.

**Table 2 Guatemala TRQs for white corn in CAFTA-DR (for the United States)**

Product Description	2018	2019	2020	2021	2022	2023	2024	2025
White corn (MT)	25,200	25,600	26,000	26,400	26,800	27,200	27,600	28,000
	20%	20%	20%	20%	20%	20%	20%	20%

Source: Ministry of Agriculture, CAFTA-DR Phasing Out

Guatemala, in addition to the TRQ system for white corn established under CAFTA-DR, has opened a World Trade Organization (WTO) quota for grains since 2012. Table 3 shows CAFTA-DR and WTO quotas for 2012-2019, in terms of availability and use. The CAFTA-DR quota filling increased to 88 percent during CY2018, while the WTO fill rate was only one percent. The CAFTA-DR and WTO fill rate for white corn responds to white corn prices in the United States. If U.S. white corn prices are lower than Mexico, Brazil or Argentina, the CAFTA-DR quota will be filled and the WTO quota may not be needed. If the U.S. white corn prices are above those of Mexico, Brazil or Argentina, the WTO filling will be the choice of importers. Such a low filling rate for the WTO quota in CY2018 was not seen since CY2013. U.S. corn prices have been competitive for the past five years.

**Table 3 Guatemala Quotas for white corn: CAFTA-DR and WTO**

Year MT	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019
<b>CAFTA-DR</b>	25,200	25,600	26,000	26,400	26,800	27,200	27,600	28,000

Authorized	22,800	23,200	23,600	24,400	24,400	24,800	25,200	
Filled	16,300	18,560	22,943	19,520	21,020	15,696	24,278	
Fill Rate	71%	80%	97%	80%	86%	63%	88%	
<b>WTO</b>	82,000	70,000	50,000	50,000	50,000	50,000	50,000	50,000
Filled	20,225	4,400	33,255	44,630	49,926	40,734	736	
Fill Rate	25%	6%	67%	89%	99%	81%	1%	

Source: Ministry of Economy, 2019

### Stocks:

For MY2020, stocks are forecast at 326,000 MT, four percent down from the MY2019 USDA forecast. Government storage capacity for food security purposes have shrunk in recent years. Original government storage capacity for grains was 200,000 MT, and was operated by the National Commercialization Institute – INDECA. At least 130,000 MT of these silos were sold, leaving approximately 70,000 MT of storage capacity. This storage is underutilized, as the government does not currently have a formal policy to purchase corn and hold it in strategic reserves for emergency use and/or to support prices. On-farm storage is significant, but difficult to measure. Farmers store the corn for their own personal consumption throughout the year. At least 250,000 MT of stocks correspond to silos operated by the food and feed industry.

### Policy:

The Guatemalan Ministry of Agriculture (MAGA) has no integrated policy to support corn production. The Guatemalan Agricultural Science and Technology Institute (ICTA) invests around \$5 million annually in corn breeding research mostly for the lowlands. MAGA also reports corn prices in the principal wholesale markets on a weekly basis. In addition, MAGA has an incipient agricultural extension service, which aims to provide technical assistance to farmers. MAGA implements the Family Agricultural Program (PAFEC in Spanish), which intends to increase production capacity in the rural areas, but has no specific corn technology transfer program in place. There is a subsidy program for vulnerable farmers who may receive some agricultural tools and 100 Kg of fertilizer. MAGA has no program to support credits or insurance, nor storage or commercialization.

Guatemala is in the process of adopting a new biotechnology regulation harmonized with Honduras under the Customs Union Agreement. The agreement requires the standardization of sanitary and phytosanitary protocols, and to unify trade practices and regulations among the three Northern Triangle countries of Central America.

### Marketing:

Guatemala lacks a sound agricultural market information system. The Institute of Statistics (INE) generates agricultural statistics by extrapolating outdated census and survey data and adjusting based on current conditions. The last agricultural census was conducted in 2003, but recently a 2017/2018 agricultural survey for basic grains (corn, beans, and rice) was conducted, generating important updates. Agricultural statistics are monitored on a yearly basis by the Bank of Guatemala, which calculates the GDP based on surveys from agricultural associations and farmers. MAGA analyzes the information generated by INE and the Bank of Guatemala, but does not generate its own agricultural statistics.

MAGA publishes market prices for the largest markets in the country. USDA has supported MAGA and INE to standardize market information for price monitoring and publication. Although MAGA publishes weekly prices for agricultural products in the markets that are monitored, <https://precios.maga.gob.gt/>, those prices are not readily available to farmers who lack access to the internet. As a result, farmers rely exclusively on intermediaries who sets prices at the farm, leaving no room for negotiation.

Guatemala has poor credit options for agricultural activities. The formal banking system has no reasonable options for agricultural credits, lacking a model for agricultural investments. Banrural, a public-private owned bank, has an agricultural credit line but demands collateral that small farmers do not have. Agricultural trust funds exist but access to those credits are cumbersome and bureaucratic. Agricultural insurance is available, but at a prohibitive cost for small corn producers.

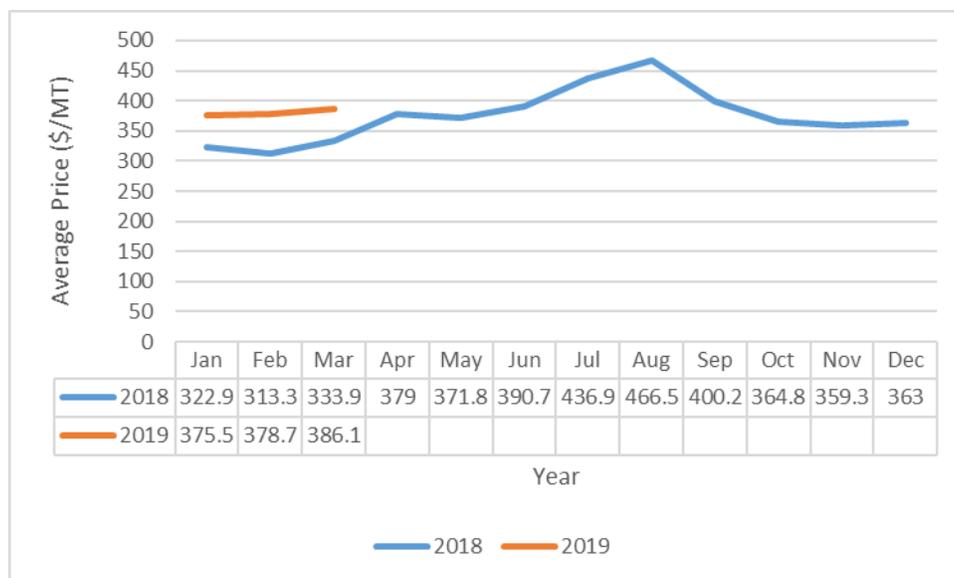
### **Prices**

Prices for imported corn are at least 38 percent lower for white corn and 50 percent lower for yellow corn compared to domestic prices. The industry directly imports both white corn (food) and yellow corn (feed). Guatemala is a net yellow corn importer. Overall, higher prices for locally produced corn in Guatemala is a result of low productivity and rising production costs. While increased contraband has contributed to lower corn prices, it is not the only factor hurting small corn producers. Lack of access to the latest agricultural production technologies, limited options of affordable credit, and rising input costs have placed Guatemalan corn producers at a comparative disadvantage. High transportation costs directly affect corn prices in Guatemala, as highways are poorly maintained, and there is a lack of roads in rural areas. Guatemala invests around one percent of GDP in public infrastructure and has the lowest amount of roads per capita in Central America, with an average 1.0 meters of road per capita, compared to Costa Rica that has 8.7 meters per capita or the United States, with 20 meters per capita. Guatemala no longer has a railroad system either. High transportation costs lead to wholesale corn prices in the highlands that are twice as much as those offered in the commercial production areas.

Corn in Guatemala is commercialized at wholesale markets in 100-pound bags. Prices are higher during the June-September period, when the second harvest has finished and the first harvest is just starting, as shown in Graph 2.

### **Graph 2**

Wholesale prices for domestic white corn in La Terminal Market, Guatemala City



Source: DIPLAN/MAGA, 2019

Retail prices vary between the different departments of Guatemala. For the March 2019 update, prices in the lowland production areas were between US\$0.15 and \$0.19 per pound. In the highlands, where the lowest yields and highest consumption are reported, prices reported as of March 2019 were as high as US\$0.32 per pound, twice the price as in the lowlands.

**Production, Supply and Demand Data Statistics:**

Corn	2017/2018		2018/2019		2019/2020	
	Jul 2017		Jul 2018		Jul 2019	
Market Begin Year						
Guatemala	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post

<b>Area Harvested</b>	880	931	870	973	870	986
<b>Beginning Stocks</b>	472	472	455	348	330	338
<b>Production</b>	1900	1908	1680	1994	1680	2021
<b>MY Imports</b>	1038	1039	1300	1070	1400	1045
<b>TY Imports</b>	1091	1116	1300	1105	1400	1110
<b>TY Imp. from U.S.</b>	951	990	0	917	0	975
<b>Total Supply</b>	3410	3419	3435	3412	3410	3404
<b>MY Exports</b>	5	2	5	2	5	2
<b>TY Exports</b>	5	3	5	3	5	3
<b>Feed and Residual</b>	1450	1039	1600	1040	1600	1041
<b>FSI Consumption</b>	1500	2030	1500	2032	1550	2035
<b>Total Consumption</b>	2950	3069	3100	3072	3150	3076
<b>Ending Stocks</b>	455	348	330	338	255	326
<b>Total Distribution</b>	3410	3419	3435	3412	3410	3404
<b>Yield</b>	2.1591	2.0494	1.931	2.0493	1.931	2.0497
(1000 HA) ,(1000 MT) ,(MT/HA)						