CROP TRAVEL ASSESSED DETERIORATED SUMMER CROP CONDITIONS IN SOUTH EAST EUROPE

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Abstract

European Union (EU) 2012/13 corn production is estimated at 57.1 million tons, down 4.4 million or 7 percent from September 2012, and down 8.3 million or 12.6 percent from last year's bumper crop. This paper contains a study about corn production estimates throughout southern Europe. Corn production in Romania and Bulgaria was severely affected by the drought. Romania corn production is estimated at 7.1 million tons compared to last year's 10.5 million. Bulgaria corn production is estimated at 1.8 million tons versus last year's 2.2 million tons.

Key words*:agricultural holdings,farms, agricultural products*

INTRODUCTION

A research was made regarding the crops from Romania and Bulgaria during the first half of August 2012. As summer crop conditions in south-east and south-central Europe have deteriorated precipitously since June when expectations had been high due to both increased planted acreage and abundant precipitation. The primary summer crops in this region are corn and sunflowerseed. Lesser amounts of barely and soybeans are also grown. Abundant spring moisture and smaller area sown to winter crops had set the stage for an expected bumper summer crop season. In some areas, 80 to 100 percent of the autumn-sown rapeseed crop had been destroyed due to a dry fall and harsh winter, leaving additional area for spring-planted corn and sunflowerseed. Temperatures spiked in July and August while precipitation was scant or non-existent. The maximum temperatures caused severe pollination problems in many areas while the lack of moisture created widespread grainfill problems.

MATERIAL AND METHODS

At the research participated various experts from the government and private industry.Were visited numerous fields and took place interviews to many farmers to better understand current conditions and to improve yield forecasting abilities. Crop travel included areas of eastern, central, western, and southern Romania and were observed the condition of

cultivating corn and sunflower and how affected these crop were in the July-September 2012 period.

In general, corn is planted first in late March or April, followed by sunflower. During August and September harvesting begins, typically first with sunflower and later with corn. This is however just a general rule, new corn varieties can begin growth at lower temperatures making it possible to plant earlier and take advantage of an earlier start to the season, with the benefit of reaching pollination prior to maximum summer temperatures. During the month of July it is critical for temperatures to remain below 35°C for both corn and sunflower to prevent aborted pollination. This year, prolonged temperatures above 35°C caused considerable damage. Heat made the pollination period for sunflower very short with temperatures up to 42°C, far above the 35°C damage threshold. Rainfall is also needed in abundance during July for the reproductive stages of corn and sunflower. Excessive rainfall can also prevent full pollination of sunflowers because bees remain off the fields during rain, forgoing their pollination duties. By mid-August, precipitation is becoming less important for corn as it quickly progresses towards maturity, but sunflower and longer season or late-planted corn can still benefit from mid-August precipitation.

RESULTS AND DISCUSSIONS

The vegetation health of the summer crops, or lack of, can be seen using the normalized difference vegetation index (NDVI) derived from NASA's MODIS imagery, as seen in the two images below. The images are from two separate periods during the 2012 season and represent the change from that time period and the 10-year average of the same time period. Show on the right, are the favorable conditions with most crop areas of the southeast colored green, symbolizing better than average conditions. The image on the left is from two months later and it shows the same crop areas to have changed to a dark orange color, depicting a poor crop.

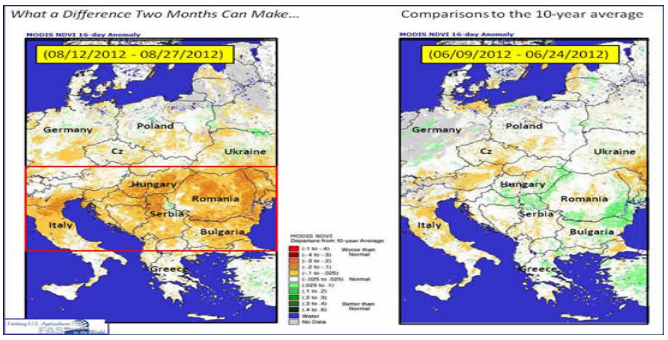

*Figure 1.***The vegetation health of summer crops, comparisons 2012 to the 10 year average**

The research coincided with corn being primarily in the mature stage and sunflower in the filling stage. Summer crops were generally two to three weeks ahead of their typical development stage due to unseasonably warm and dry weather that dominated the 2012 summer. There was a wide variance in the crop stages observed during early August. Some corn was observed to be in the milk stage and some sunflower was still flowering but the majority of the crop was mature. Also were seen fields of both corn and sunflower being harvested, typically a September activity. One farmer had begun harvesting corn on July 30th, his earliest start ever. The crops in southern Romania along the Danube River were in poor shape. Maximum temperatures had remained well-above the 35 °C (104°F) heat threshold for sustaining damage during a considerable portion of the summer.

The severe heat limited or aborted pollination while the lack of summer rainfall kept soil moisture nearly non-existent. This reduced kernel size for both corn and sunflowerseed. Eastern Romania's summer crops near the Moldovian border were also in poor condition, and they were even more advanced as dryness and heat had greatly accelerated their progress. Central Romania or the Transylvania region has more subsistence farms. In this secondary agricultural region, crops were in fairly good condition, likely due to the cooler temperatures, more rainfall, and their slower crop development, which kept them shielded from much of the heat during tasselling and silking.

Romania's crop-intensive south, along the Danube River, appeared to have suffered the most summer damage, with corn and sunflower having experienced the highest temperatures in Romania.

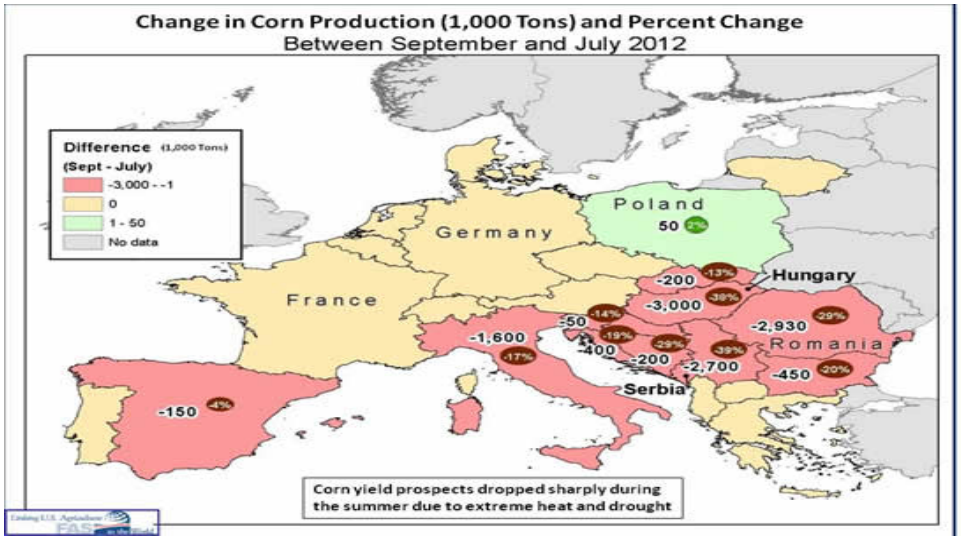

Figure 2. **Change in corn production between September and July 2012**

The Change in Corn Production Map above, depicts the estimated national changes to corn production for the two month period during July and August. The numbers within the countries represent USDA's estimated production change since the July update, and the percentages within the ovals represent the percent change of production since July.

Crops in western Romania, adjacent to Hungary and Serbia, were in the best shape of any along the crop route because of the favorable combination of more rainfall, less heat, and higher levels of technology. A small area in northwest Romania is typically the highest yielding region, but becauseof it's more remote location, that area was not visited. The crop in Bulgaria was also reduced due to heat and dryness. It was observed, however, as having been in better shape than the crop just across the Danube River in Romania. Rainfall patterns likely contributed to more moisture and hence the overall better health of the crops. In general, northern Bulgaria's crop was below average but the crop improved to the east and decreased in the far south.

CONCLUSIONS

Overall, expectations are for small amounts of oil from sunseed kernels and increased corn abandonment or more silage area. In general, because of its ability to pollinate longer, and its higher tolerance to drought, sunflowerseed seemed to have suffered less damage than corn.

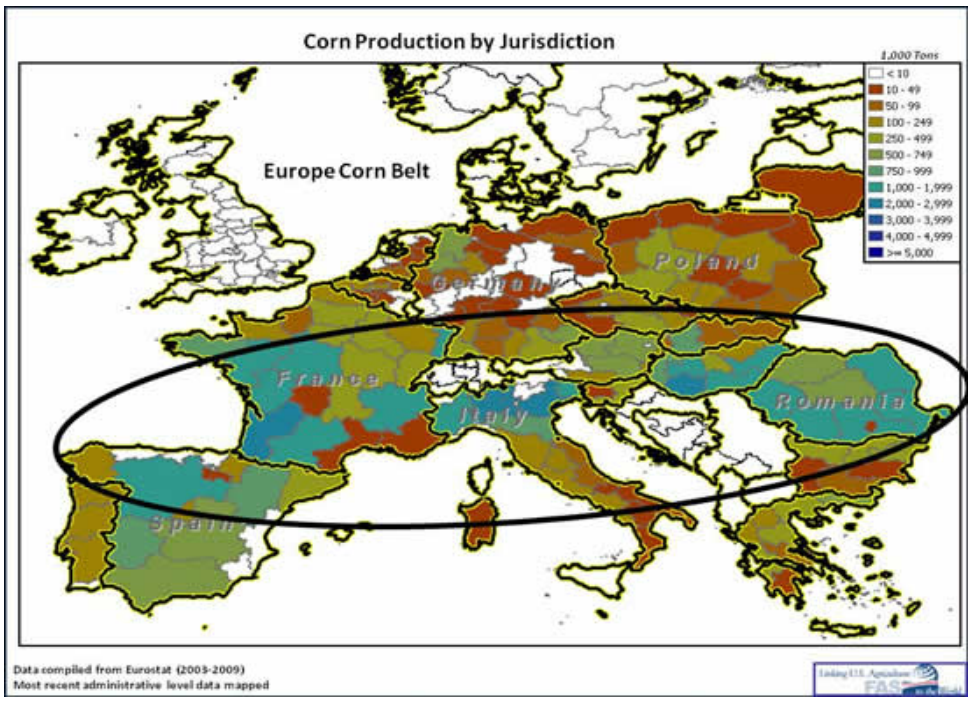

*Figure 3.***Corn production 2003-2009 by Jurisdiction**

According to a number of sources, Romania had an estimated 3.0 million hectares of irrigated crops twenty years ago. Most of this water was pumped from the Danube River into concrete channels to be distributed to arable fields across the country. This system fell into disrepair after changes in the government during the early nineties. Agricultural officials stated that the 3.0 million hectares that were irrigated during the command economy times were not economically feasible and would not make sense in today's market economy.

The cost of pumping water up to field level was a huge expense that would not be practical in today's system. Irrigation is largely absent from the region's cereal and oilseed crop infrastructure. The high cost of energy and the lack of government sponsored projects to bring water from its source to the edge of fields have inhibited expansion of irrigation. Another major factor in the lack of irrigation facilities is the lack of single ownership of land. There are many small and fragmented land owners who rent their parcels to large farmers. Many of these large farmers could finance an irrigation project and would like to, but in order for the capital investment be practical, the farmer needs to own the land, but the small farmers are reluctant to sell it because they continue to collect income from the land.

In addition to the high temperatures that prevented pollination, minimum night temperatures didn't drop low enough for the corn plants to cool down, further inhibiting yield. Farmers in southeast Europe will often maximize sunflower area because the crop is well adapted to hot and dry conditions that are often part of the region's summer weather pattern. While sunflower should not be planted more than once every seven years on any particular plot but because of its susceptibility to disease, its rotation is frequently pushed to every three to four years. Corn, the other major summer crop, is more affected by high temperatures and more water dependent, making it a more risky choice.

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