

Imperial County Agricultural Briefs



Features

From your Farm Advisors

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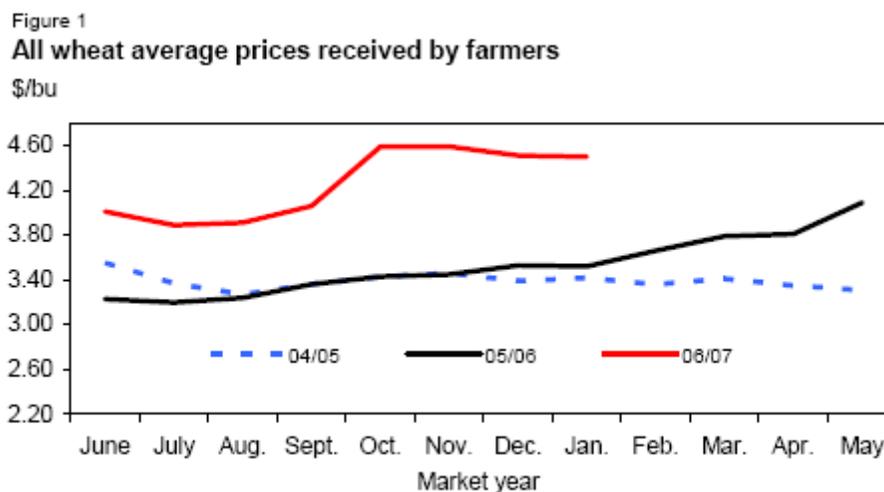
Planning For Wheat Harvest

Rick Bottoms, Ph.D.



U.S. winter wheat was up for 2007 to total 44.1 million acres, up 9 percent from 2006. Durum wheat plantings in Arizona and California for 2007 harvest are estimated at a combined 180,000 acres. This is up 24 percent from 2006. Planted acreage is up 5,000 acres in Arizona and up 30,000 acres in California due mostly to good prices. Unfortunately, the projected price range (Figure1) is unchanged at \$4.15 to \$4.45 per bushel (July delivery). Even with greater than normal market demands for BioEnergy crops

like corn, soybean and others wheat demands though increased for filling in industry needs has not been short in supply to cause overall wheat prices to rise similarly to corn and soybeans. This means growers need to capitalize on their earlier investments of equipment, crop inputs, talents, management decisions past and present including harvesting skills. To be able to determine potential wheat grain yield, the use of an estimating tool may aid in management decisions including harvesting planning.



Use of the following formula prior to grain development will require the use of estimates, such as the average number of kernels per head. Using such estimates will potentially result in a less accurate yield prediction. Despite these potential errors, the formula provides a reasonable estimate for potential winter wheat grain yield. This formula has been used by many hail adjusters in wheat producing states. If not all the parameters in the formula are known, some assumptions can be made. To use the formula, complete the following steps:

1. Count the number of heads (may count tillers to estimate heads) per foot of row in at least five sites within the field and calculate an average number of heads per foot for the selected field (select sites representative of the field).
2. Determine the average number of kernels/head (the product of number of spikelets/head x number of kernels/spikelet) from at least five heads at each of the five sites. On average, winter wheat contains 22 kernels/head. This average number of kernels/head should probably be adjusted downward for wheat that is doing poorly. How far down is a matter of speculation.
3. Measure the distance in inches between the rows.
4. Use your findings from Steps 1 to 3 in the following formula:

$$\text{Yield (bu/acre)} = [(\text{No. of heads/ft} \times \text{No. of kernels/head}), \text{Row space (inches)}] \times 0.48$$

For example, you have obtained the following information from 5 feet of row sampled at five locations in your field:

<i>Site</i>	<i>No. of heads/5-feet of row</i>	<i>No. of kernels/5 heads</i>
1	164	102
2	129	120
3	172	109
4	145	117
5	140	102
<i>Total</i>	750	5



Average number of heads per foot of row = 750, 25 (5 foot of row x 5 sites) = 30.

Average number of kernels per head = 550, 25 (5 heads per site x 5 sites) = 22.

The row spacing is 6 inches.

To calculate the estimated yield, multiply the average number of heads per foot (30) by the average number of kernels per head (22). The result is 660. Divide 660 by 6 (row spacing in inches) to get 110. Finally, multiply 110 by 0.48 to arrive at the estimated yield of 52.8 bushels/acre. To determine the tons per acre, multiply 52.8 bushels per acre by 60 lbs per bushel. The result is 3,168 lbs per acre, then divide lbs by 2000 (lbs per ton). The result is 1.58 ton per acre.

Remember that this tool is only estimating. These estimates assume the plants are healthy, moisture is adequate, and weed control and fertility meet crop requirements.

References:

Lyon, D. and R. Klein, 2001. Estimating winter wheat grain yields. Univ. Neb. Publ. G1429
 USDA Wheat Outlook., 2007 Winter Wheat Plantings Up From 2006. WHS 07a 2007

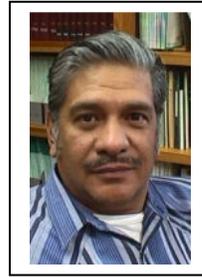
Ethanol, Not Only From Corn

Juan N. Guerrero and Rick Bottoms

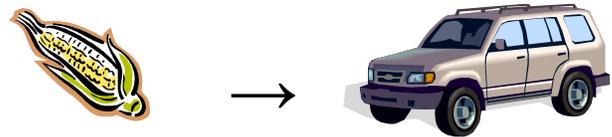
The current increasing demand for corn to supply the exploding ethanol industry has impacted almost all of US agriculture. In just one year, the price of corn grain has almost **doubled!** The increase in corn price has impacted the price structure of all the grain crops as well. From basic economics, if we remember that long ago, the price of one commodity has an influence in a corresponding competitive commodity; i.e., the increasing price of corn is dragging along with it the prices of barley, sorghum, soybeans, wheat, and triticale as well. Not only the President of the U.S., but several state governors have mandated that in the very near future the use of a certain percentage of ethanol fuel will be obligatory in public vehicles.

In the US, ethanol from corn has been the feedstock most used. However, ethanol may be produced from a number of cereals besides corn. Currently about 20% of the nation's corn crop is being used by the ethanol industry. The ethanol boom however is not being welcomed by all of U.S. agriculture. The livestock sector, especially pork and poultry producers, have complained about the increase in corn prices.

Although the price of corn is very high for the feedlot and dairy industries, not everything about ethanol production is bad for cattle feeders. After ethanol is produced from corn,



valuable by-products remain; *distillers' grains and solubles*. Actually, the feed value of this by-product is **greater** than that of corn grain AND it is cheaper than corn grain.



Besides corn grain, the U.S. ethanol industry has used wheat, barley, triticale, and sorghum as feedstocks. Basically, the ethanol industry is based on the conversion of glucose or other simple sugars to ethanol by fungal enzymes. The starch in grains is composed of glucose units. The starch content of corn, sorghum, triticale, and barley is 72, 74, 72, and 60%; respectively. Currently, about 15% of the US grain sorghum crop is already being used by the ethanol industry. One bushel of grain sorghum produces approximately the same amount of ethanol as one bushel of corn. For irrigated agriculture, sorghum is much more water efficient than corn. For approximately the same grain yield, a corn crop will use from 30 to 60% more water than a comparable sorghum crop. As a feed grain,

sorghum has about 92% the value of corn. Sorghum by-products from the ethanol industry

are about 5% less digestible than corn by-products. Even if sorghum by-products are lesser in nutritional value than corn by-products, sorghum by-products are still cheaper than corn grain, still great feed! In some research studies, the value of sorghum by-products was equal in value to corn by-products. Triticale has been used as a feedstock for the ethanol industry in Canadian ethanol production plants.

As the ethanol industry becomes more prevalent in the Desert Southwest, besides corn; grain sorghum and triticale should also be considered feedstocks.

Two New Whitefly Transmitted Viruses in Six Months

Eric T. Natwick, Tom Turini and Robert Gilbertson



Several silverleaf whitefly, *Bemisia tabaci* Biotype B –transmitted viruses occur in Imperial County such as Squash leaf curl virus (SLCV), Cucurbit leaf crumple virus (CuLCrV), Cotton

leaf crumple virus (CLCrV) and Lettuce chlorosis virus (LCV). Now, we have gotten two new whitefly transmitted viruses in the past six month; Cucurbit Yellow stunting disorder virus



(CYSDV) and Tomato yellow leaf curl virus (TYLCV). It is unknown how these two new viruses were introduced. However, it is possible that they were moved into the Valley via transplants; either for commercial production or through retail stores for home gardeners or landscape. Unfortunately, without more stringent regulations on movement of vegetable and ornamental transplants from other states, this type of introduction of new diseases and insects is a constant threat to our agricultural production.

The first of the two new virus diseases to be found was CYSDV in October of 2006. CYSDV can be a devastating disease of several melon and squash crops and caused substantial damage to melons in the Valley last fall. This virus was also found in Arizona last fall and was found in several melon and squash growing areas in Mexico. The symptoms on melons squash and cucumber are expressed first on crown leaves as a yellow mottling. The yellow spots soon coalesce into a general yellowing between veins which remain green. Infection with CYSDV

early in the plants life cycle can lead to severe loss of yield through reduced set, and reduced fruit size. There can also be a quality loss due to reduced sugar in the fruit of melons.

CYSDV is dependant on the silverleaf whitefly for transmission in the Imperial Valley. The virus is not seed-borne nor mechanically transmitted. The virus is transmitted by whiteflies in a semi-persistent manner. The whitefly adult must feed for at least 2 hours to acquire this crinivirus and can remain infectious for 7 to 9 days. Natural infections have been reported in summer and winter squashes, cucumbers, musk melons such as cantaloupe and honeydew melon, and watermelon.

In Texas where CYSDV was first detected in 2000, host free periods have been successful in managing the disease. Insecticides can not protect crops from CYSDV because whitefly adults migrate from field to field spreading the virus. Complete crop destruction followed by a cucurbit host free period is the only proven control method. It may be several years before CYSDV-Resistant cucurbit cultivars are available to growers. Proper identification of CYSDV is available at the UCD, Plant Pathology Department. Cucurbit plants suspected to have CYSDV infection can be brought to the **Imperial County Cooperative Extension Office** and they will be shipped to Dr. Robert Gilbertson at UCD and Dr, William Wintermantel at USDA ARS, Salinas, CA.

TYLCV

Tomato yellow leaf curl virus (TYLCV) is most recent whitefly-transmitted virus disease to appear in Imperial County. TYLCV threatens commercial tomato production, pepper production, transplant production of peppers and tomatoes, and home gardens. Dr. Robert Gilbertson, University of California Davis (UCD) identified TYLCV from greenhouse tomato samples from Brawley, California in March 2007. TYLCV is transmitted by adult silverleaf whiteflies and can spread rapidly, but TYLCV is not seed borne nor is it mechanical transmitted. The presence of silverleaf whitefly host plants, both cultivated (i.e., peppers and tomatoes) or wild hosts (i.e., sowthistle, cheeseweed and nightshade weeds) during spring and summer may lead to whitefly migration and spread of TYLCV. During late spring, summer, and early fall, growers need to monitor whitefly populations very closely and destroy whitefly weed hosts and crop residues (i.e., melons and cotton). TYLCV has a broad host range from several plant families including Solanaceae (tomato, peppers, various nightshade weeds, and ornamental plants), Malvaceae (cheeseweed), and Fabaceae (beans).

Symptoms: Typical symptoms for this disease in tomato are yellow (chlorotic) leaf edges, upward leaf cupping, leaf mottling, reduced leaf size, and flower drop. TYLCV can have a severe impact on tomato production. Plants infected at an early stage won't bear fruit and their growth will be severely stunted. TYLCV identification based only on symptomatology is unreliable, because similar symptoms can be caused by

other viruses or various growing conditions. Proper identification of TYLCV is available at the UCD, Plant Pathology Department. Crop or Weed plants suspected to have TYLCV infection can be brought to the **Imperial County Cooperative Extension Office** and they will be shipped to Dr. Robert Gilbertson at UCD.

Management Recommendations:

1) Use only virus- and whitefly-free tomato and pepper transplants. Transplants should be treated with Capture (bifenthrin) or Venom (dinotefuran) for whitefly adults and Oberon for eggs and nymphs. Imidacloprid or thiamethoxam should be used in transplant houses at least 7 days before shipping. Transplants should be produced in areas well away from tomato and pepper production fields.

2) Use a neonicotinoid insecticide, such as dinotefuran (Venom) imidacloprid (AdmirePro, Alias, Nuprid, Widow, and others) or thiamethoxam (Platinum), as a soil application or through the drip irrigation system at transplanting of tomatoes or peppers. After the efficacy of the neonicotinoid insecticide application begins to decline, the secondary spread of whiteflies will need to be controlled. Monitor whitefly populations throughout the season, treating when present. Rotate insecticide classes for insecticide resistance management (IRM). Foliar insecticide treatments used in IRM for whitefly control include: Capture, a pyrethroid; foliar neonicotinoid insecticides dinotefuran (Venom), imidacloprid (Provado),

and thiamethoxam (Actara), but do not use if a neonicotinoid insecticide was applied as a soil or drip irrigation treatment; insect growth regulators such as pyriproxyfen (Knack) and buprofezin (Courier); insecticidal soap; and crop oils. Highly UV-reflective mulches

(metalized) and low rates of crop oil (0.25 -0.50 percent), can be used as whitefly repellents to reduce whitefly feeding and virus transmission.

3) Sanitation is very important for preventing the migration of whitefly adults and the spread of TYLCV. Rogue tomato or pepper plants with early symptoms of TYLCV from fields by placing infected-looking plants in plastic bags immediately at the beginning season, especially during first 3-4 weeks. Maintain good weed control in the field and surrounding areas. Prevent the spread of any whiteflies to healthy plants. Tomato and pepper fields should be cleaned up immediately after harvest. Also destroy crop residues of melons and cotton immediately after harvest to reduce whitefly migration.



CIMIS REPORT

Khaled Bali and Steve Burch*



California Irrigation Management Information System (CIMIS) is a statewide network operated by California Department of Water Resources. Estimates of the daily reference evapotranspiration (ET_o) for the period of May 1 to July 31 for three locations in the Imperial County are presented in Table 1. ET of a particular crop can be estimated by multiplying ET_o by crop coefficients. For more information about ET and crop coefficients, contact the UC Imperial County Cooperative Extension Office (352-9474) or the IID, Irrigation Management Unit (339-9082).

Please feel free to call us if you need additional weather information, or check the latest weather data on the worldwide web (visit <http://tmdl.ucdavis.edu> and click on the CIMIS link).

Table 1. Estimates of daily Evapotranspiration (ET_o) in inches per day

Station	May		June		July	
	1-15	16-31	1-15	15-30	1-15	16-31
Calipatria	0.32	0.36	0.39	0.40	0.39	0.38
El Centro (Seeley)	0.31	0.34	0.36	0.38	0.38	0.37
Holtville (Meloland)	0.32	0.35	0.38	0.39	0.39	0.38

* Irrigation Management Unit, Imperial Irrigation District.