WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 19, Issue 14 **June 24, 2011**

Vegetable Crops

Vegetable Crop Insects – *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

Melons
Continue to scout all melons for aphids, cucumber beetles, and spider mites. With the recent hot weather, be sure to watch for an increase in spider mite activity. The threshold for mites is 20-30% infested crowns with 1-2 mites per leaf. Acramite, Agri-Mek, bifenthrin, Danitol, Oberon, Portal and Zeal are labeled on melons for mite control. *Be sure to read all labels carefully for rates and restrictions since some are restricted to only one application as well as ground application only*.

Peppers
As soon as the first flowers can be found, be sure to consider a corn borer treatment. Depending on local corn borer trap catches, sprays should be applied on a 7 to 10-day schedule once pepper fruit is ¼ - ½ inch in diameter. Be sure to check local moth catches in your area by calling the Crop Pest Hotline (instate: 800-345-7544; out of state: 302-831-8851) or visiting our website at http://ag.udel.edu/extension/IPM/traps/latestblt.html. You will also need to consider a treatment for pepper maggot. Be sure to watch for beet armyworm since we have received reports of the first detection of larvae which can quickly cause defoliation.

Potatoes
Continue to scout fields for Colorado potato beetle and leafhoppers. We have seen an increase in leafhopper populations and low levels of aphids have also been found. Controls will be needed for green peach aphids if you find 2 aphids per leaf during bloom and 4 aphids per leaf post bloom. This threshold increases to 10 per leaf at 2 weeks from vine death/kill. If melon aphids are found, the threshold should be reduced by ½.

Snap Beans
Continue to sample all seedling stage fields for leafhopper and thrips activity. As a general guideline, once corn borer catches reach 2 per night, fresh market and processing snap beans in the bud to pin stages should be sprayed for corn borer. Sprays will be needed at the bud and pin stages on processing beans. Acephate can be used at the bud and pin stages on processing beans but remember it has a 14 day wait until harvest. Additional sprays may be needed after the pin spray on processing beans. Since trap catches can change quickly, be sure to check our website for the most recent trap catches and information on how to use this information to make a treatment decision in processing snap beans after bloom (http://ag.udel.edu/extension/IPM/traps/latestblt.html and http://ag.udel.edu/extension/IPM/thresh/snapbeanecbthresh.html). Once pins are present on fresh market snap beans and corn borer trap catches are above 2 per night, a 7 to 10-day

schedule should be maintained for corn borer control.

Sweet Corn
Continue to sample all fields from the whorl through pre-tassel stage for corn borers and corn earworms. Both species can be found feeding in whorls and tassels of sweet corn. A treatment should be applied if 15% of the plants are infested with larvae. The first silk sprays will be needed for corn earworm as soon as ear shanks are visible. Be sure to check both blacklight and pheromone trap catches since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings (http://ag.udel.edu/extension/IPM/traps/latestblt.html and http://ag.udel.edu/extension/IPM/thresh/silkspraythresh.html). You can also call the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851). You will also need to scout for fall armyworm larvae in whorl stage sweet corn. A treatment should be considered when 12-15% of the plants are infested. Since fall armyworm feeds deep in the whorls, sprays should be directed into the whorls and multiple applications are often needed to achieve control.

Keeping it Level

– *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

May and early June planted lima bean fields are being cultivated at this time. As cultivation season progresses, lima bean growers are reminded that harvest recovery can be affected by cultivation practices. In research by Dr. Jim Glancy and Ed Kee, they found harvest losses as high as 25% when ridging was 3 inches or more. A large part of this was due to pods left on plants that could not be harvested. It is therefore important to have the most level conditions possible. Cultivating too deeply, at too fast of speeds, when fields are too wet, or in ways that create ridges and valleys in the field will reduce harvested yields. Excessive wheel tracking in fields for other operations such as sidedressing or spraying can also cause losses.

Stand Reductions in Lima Beans

– *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Recommendations are for a stand of 3 to 4 plants per foot of row for baby limas. However, each year there are some lima bean fields that end up with lower stands than expected due to soil crusting, planter malfunctions, seed quality issues, errors in setting planting rates, or other problems. I recently visited a field that was planted deeper than normal in wet soil. The soil was tight and seeds were having a hard time emerging. The only option was to rotary hoe the field. Stand reductions are expected in this situation.

Fortunately, lima beans compensate very well for stand loss by producing larger plants that can bear more pods. As long as there are not large gaps in rows without plants, there will be little effect on yield. In research at UD, stand reductions of 50% reduced yields by only 14% in baby lima beans.

Air Pollution Damage in Vegetables

– *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

We are starting to see evidence of air pollution damage in sensitive vegetable plants. Those vegetables most susceptible include potatoes, watermelons, cantaloupes, snap beans, pumpkins, and squash.

Damage is most common during hot, humid, hazy weather with little wind. Air inversions, when warm air at the surface is trapped by even hotter air in the atmosphere above, lead to build up of air pollutants that cannot disperse and, consequently, plant injury. The most common form of air pollution injury to plants is ozone damage. Ozone is a strong oxidant and is formed by the action of sunlight on products of fuel combustion. It is moved from areas of high concentration (cities, heavy traffic areas) to nearby fields.

Ozone injury in susceptible vegetable varieties develops when ozone levels are over 80 ppb for four or five consecutive hours, or 70 ppb for a

day or two when vegetable foliage at a susceptible stage of growth. Because it occurs in areas with high levels of automobile exhausts, crop injury is often visible on fields in close proximity to roads, especially with heavy summer weekend traffic. High pollution indexes in Baltimore and Washington are also a good indication that ozone damage may occur.

In potatoes, symptoms of ozone damage occur on the most recently emerged leaves and can be seen as a black flecking. Early red varieties are most susceptible.

Injury on watermelon leaves consists of premature chlorosis (yellowing) on older leaves. Leaves subsequently develop brown or black spots with white patches. Watermelons are generally more susceptible than other cucurbits to ozone damage. Damage is more prevalent when fruits are maturing or when plants are under stress. Injury is seen on crown leaves first and then progresses outward. Seedless watermelon varieties tend to be more resistant to air pollution injury than seeded varieties, so injury often shows up on the pollenizer plants first. "Ice box" types are the most susceptible.

Ozone injury on watermelon

In muskmelons and other melons, the upper surface of leaves goes directly from yellow to a bleached white appearance.

Ozone injury on squash and pumpkins is intermediate between watermelon and cantaloupe starting with yellowing of older interior or crown leaves. These leaves subsequently turn a bleached white color with veins often remaining green.

In snap and lima beans, ozone causes small bleached spots giving a bronze appearance on upper leaf surfaces and pods. Leaves may ultimately turn chlorotic and senesce (drop).

Ozone injury can be easily misdiagnosed as mite injury, pesticide phytotoxicity, or deficiencies.

The key to avoiding air pollution injury is to plant varieties that are of low susceptibility and to limit plant stresses. Certain fungicides such as thiophanate methyl (Topsin and others) offer some protection against ozone damage.

Downy Mildew Updates

– *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland*; keverts@umd.edu

Basil Downy Mildew

Downy mildew on basil has been confirmed in Dunkirk, MD (Calvert County between the DC metro area and Southern Maryland). The infected plants are in a homeowner's yard, but commercial growers should be on the lookout.

Cucurbit Downy Mildew

As a result of slightly more favorable conditions, **Downy mildew on cucurbits** is moving northward. Within the last week there have been three reports of downy mildew on CUCUMBER in North Carolina, including one on the border of Virginia. The Cucurbit Downy Mildew forecaster says that disease spread is possible in the mid-Atlantic region, including areas in southern Maryland, the eastern shore, and in Delaware. Scout plants rigorously and monitor the CDM website http://cdm.ipmpipe.org/

Lower leaf surface of a cucumber leaf infected with downy mildew. Courtesy of Gerald Holmes, Valent USA Corporation, Bugwood.org

Downy mildew symptoms on upper leaf surface of cucumber.

Downy mildew symptoms on watermelon, note the differences.

Phytophthora Fruit Rot on Cucurbits - *Bob Mulrooney, Extension Plant Pathologist*; bobmul@udel.edu

Conditions have not been very favorable for fruit rot lately but we always seem to run the risk of scattered thunderstorms and frog-strangling rain events at this time of the year. Phytophthora blight is a tough disease to control, but if you have cucurbits in fields that had fruit rot in the past you are at very high risk if the soil stays saturated even for a few hours. This is a fungus that moves in water and the spores will move where water goes. (Spores will not move more than a few feet in the air.) Some additional cultural controls would be rotation (5 years or more) for watermelons, sub-soiling between the rows before they close to help water drain faster and to keep the fruit out of standing water. Fungicides will only suppress the disease and those that have the best activity are the following: Presidio, Revus, Ranman plus a surfactant (see label), Forum, Gavel and Tanos. Depending on the test, the season, and the location, the efficacy of these fungicides varies. However, proper application of these products will result in better yields than in untreated fields. Remember that Revus and Forum are Group 40 fungicides and have the same mode of action, so they should not be applied in succession. All of these fungicides except Ranman should be tank mixed with fixed copper if the label allows**. Fixed copper is not compatible with Ranman plus the surfactant. Good coverage of fruit is very important.** For more information on fungicides check the 2011 Commercial Vegetable Production Recommendations.

Potato Disease Advisory #10 – June 23, 2011 - *Bob Mulrooney, Extension Plant Pathologist*; bobmul@udel.edu

Location: Art and Keith Wicks Farm, Rt 9, Little Creek, Kent County.
Greenrow: May 3

Date	Late Blight		Early Blight	Spray Interval Recommendation
	DSV	Total DSV	Accumulated P-days	
6/6	1	58	251	10-days
6/6-6/8	0	58	263	10-days
6/8-6/9	0	58	267	10-days
6/10	2	60	274	10-days
6/11	4	64	282	5-days
6/12	2	66	291	5-days
6/13	0	66	301	7-days
6/13-6/15	0	66	318	7-days
6/16	1	67	328	7-days
6/17	0	67	336	7-days
6/18-6/19	0	67	352	10-days
6/20-6/22	0	67	377	10-days

Continue to scout fields for symptoms of late blight. Conditions will continue to favor early blight. We have surpassed the 300 P-day threshold for initiating early blight sprays.

Early Blight and Black Dot
Many fields have flowered and this is a good time to consider switching to an application or two of Gem, Headline, Quadris, or Evito (no black dot label) for early blight **susceptible** varieties. This can also be helpful for late season varieties including russets if stress makes plants susceptible to black dot later. Make one or two applications at the end of flowering and repeat 14 days later. Apply mancozeb or chlorothalonil 7-days later between the two applications. Another product that is labeled for early blight is Revus Top from Syngenta. Revus Top is a combination product of Revus (mandipropamid, Group 40) plus difenoconazole which is triazole fungicide (Group 3). Difenconazole has been used in Europe very successfully for early blight control. Since it is a different mode of action than the strobilurin fungicides (Group 11) it would be a good alternative if resistance is an issue if Gem, Quadris, or Headline are not controlling early blight.

For specific fungicide recommendations, see the 2011 Delaware Commercial Vegetable Production Recommendations Book.

Agronomic Crops

Agronomic Crop Insects – *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

Alfalfa
Continue to sample for potato leafhoppers on a weekly basis. We are starting to see a significant increase in populations. Once plants are yellow, yield loss has already occurred. The treatment thresholds are 20 per 100 sweeps on alfalfa 3 inches or less in height, 50 per 100 sweeps in 4-6 inch tall alfalfa and 100 per 100 sweeps in 7-11 inch tall alfalfa.

Field Corn
In recent years, we have seen an increase in primarily brown stinkbug damage to developing corn ears -- especially when fields are adjacent to wheat fields. Last year, we also saw damage from Brown Marmorated Stink bug (kernel damage not distorted ears) in areas north of the

canal in New Castle County. We are continuing to survey fields to evaluate the extent of the damage from all species this season. The following is a summary of information from the University of Georgia on stink bug damage in corn as well as pictures of damage.

http://georgiagraincrops.com/2011/05/25/stink-bug-control-in-ear-stage-corn/

"Corn is most susceptible to stink bug injury during ear formation before tasseling stage (VT). Bugs will feed through the sheath, causing a dead spot on the ear. As the ear expands it becomes distorted and curves usually outward.

"Feeding during silking and pollen shed (R1) also will kill kernels on the ear. Once the ear has elongated, stink bug feeding during the blister and milk stages blasts individual kernels usually causing them to abort."

Although we have not developed thresholds for our area, the following thresholds are used in Georgia : 25% infested plants (1 bug per 4 plants) as a threshold during ear elongation to pollen shed and 50% infested plants (1 bug per 2 plants) during the later part of pollen shed and blister/milk stage.

We also see that initially stink bugs tend to be more prevalent on the field edge, so only a perimeter spray may be needed.

Soybeans

Be sure to sample fields for bean leaf beetles, potato leafhoppers, grasshoppers, green cloverworm and spider mites. Grasshopper populations have increased significantly, especially in no-till fields. As barley and wheat are harvested and soybeans are planted, these fields will be susceptible to attack and grasshopper feeding can often cause stand loss. If stand reductions are occurring from plant emergence to the second trifoliate, a treatment should be applied. Although no precise thresholds are available, a treatment may be needed if you find one grasshopper per sweep and 30% defoliation from plant emergence through the pre-bloom stage. Numerous products are labeled for grasshopper control including a number of pyrethroids, dimethoate, Lorsban (chlorpyrifos), Orthene 97 (acephate) and Sevin XLR (carbaryl)i. **Be sure to check all labels carefully before combining insecticides and herbicides since there are a number of restrictions on the labels.**

We are also seeing an increase in defoliation from green cloverworm, especially in drought-stressed fields. The best way to make a treatment decision in full season soybeans is to estimate defoliation. Before bloom, the defoliation threshold is 30%. As full season beans enter the reproductive stages, the threshold drops to 15% defoliation.

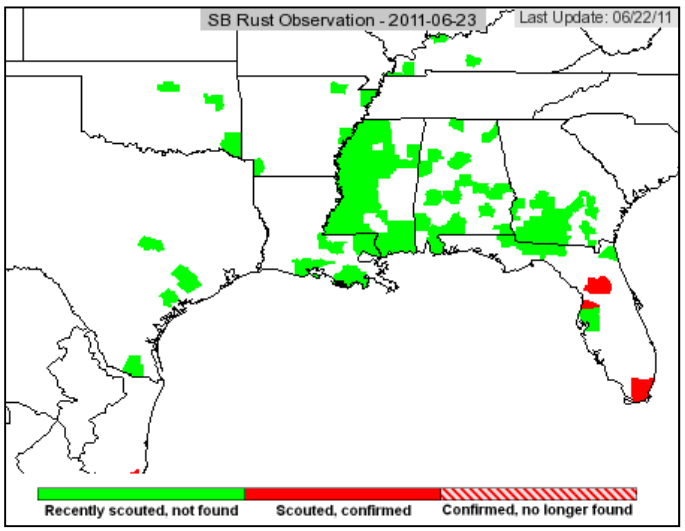
Continue to watch carefully for spider mites. The recent rains in some areas of the state are helping to soybeans to grow ahead of damage. However, in other areas we are finding fields with economic levels of mites, both on field edges and in some cases in field interiors – so be sure to scout the entire field to make a treatment decision. Labeled materials include dimethoate, Lorsban, Hero (zeta-cypermethrin + bifenthrin) as well as a number of stand-alone bifenthrin products. All of these products need to be applied before mites explode. **Be sure to read the labels for use rates and restrictions – including but not limited to combinations with herbicides, number of applications as well as the time between applications**

Soybean Disease Update

- *Bob Mulrooney, Extension Plant Pathologist*; bobmul@udel.edu

Soybean Rust Report.

There is very little soybean rust activity to report. It has been very dry and hot in the Gulf Coast region where soybean rust overwinters. It has only been found on kudzu so far this season. The risk of soybean rust is very low now even for the southeast. I continue to monitor soybean rust development in the south and will provide a report periodically as the season progresses.



Septoria Brown Spot

Septoria brown spot is one of the earliest fungal diseases that we see on soybean and can be found on the unifoliate leaves and the lower trifoliate leaves when it is present. Badly infected unifoliate leaves will usually fall from the plant and we will not see this disease again until the soybeans canopy and conditions would be favorable for infection. Most seasons this disease is not yield limiting.

Septoria brown spot on unifoliate leaves of soybean.

Mowing Techniques for Pastures Following Heading - *Richard Taylor, Extension Agronomist;* rtaylor@udel.edu

Last year there were a number of questions concerning the use of a technique called top cutting, in which the tops of the seed heads of cool-season grasses were removed using a bush hog or rotary mower raised high enough to clip the upper $^{1}/_{3}$ to ½ of seed stalk. The word going around was that it would stimulate new growth and improve both forage quality and quantity. I asked a number of forage experts about the practice last year and the consensus was that the practice was unlikely to offer any benefits to grazers at all.

This year I was surprised this past week when another unique practice was employed on a very large area of pastures near my home. In this case, the mower was lowered to remove the top 2/3 of matured growth but instead of mowing the whole pasture random paths were cut through the pasture (see Photos 1 and 2).

The question on my mind is what advantage this type of mowing pattern offers the grazer? The many pastures on this farm are used to graze both cows and horses in a continuous grazing system. One idea was that the paths gave the livestock pathways to move around the pasture but in observing the pastures during the past week I have not seen any tendency of the cows or horses to preferentially use the pathways. As visible in the photos, regrowth of the pasture grasses is occurring so that some improvement in quality forage is occurring and at some point the livestock will make use of the new growth which will be much higher in crude protein, digestible dry matter, and lower in acid and neutral detergent fiber.

Another less serious idea raised by a producer that I asked about this type of practice was that the person mowing the pastures was less than sober or was out having fun. I did watch the mowing process long enough to determine that the mowing was being done deliberately; and, considering the number of acres mowed, it was done purposely.

Photo 1. Random paths mowed through beef and horse pastures

I do have a question for the grazers who may read this article. That question is whether they can think of some reason for this type of mowing process. If you can think of a purpose for this procedure, please email me with your thoughts as I would like to know what this type of procedure can accomplish.

Photo 2. Random paths mowed through beef and horse pastures and showing regrowth of pasture grasses

While on the topic, mowing pastures is one of the very useful management techniques a grazer has to both improve pasture and feed quality and to stimulate new production from the pasture grasses. When continuously grazing as is done in the above situation, mowing is most effective when done shortly after full emergence of the seed head on the majority of the pasture grass plants although many producers do not mow until full flowering or even later. Delaying the mowing operation too late can delay new tiller development and deplete root and crown energy reserves as seeds begin to develop and draw energy from the storage organs. In rotationally grazed pastures, mowing is often replaced by hay making on any unused grazing cells or paddocks. In cells used for several grazing cycles, mowing is often needed to remove grass that is overly mature due to preferential grazing of some grasses or to avoidance of dung areas. In all these cases, mowing removes old growth and stimulates new tiller development and improved forage quality and productivity.

Manganese Deficiency on Corn as Related to Soil Organic Matter - *Richard Taylor, Extension Agronomist;* rtaylor@udel.edu and *Phillip Sylvester, Kent Co., Ag Agent*; phillip@udel.edu

In past articles, we've talked about finding manganese (Mn) deficiency in small grains (this spring) and soybeans (last year) but in the past week or two we've found the problem in some corn fields as well. Symptoms of Mn deficiency in corn include stunting (Photo 1) and the typical interveinal chlorosis in which the veins remain green and the tissue between veins turns light yellow (Photo 2). Photo 3 and 4 show the field where the deficiency occurred with the good areas in the far distance. It should also be noted that the corn was drought stressed as well.

Photo 1. Manganese deficient corn plants (right) compared with normal corn (left)

Photo 2. Typical interveinal chlorosis caused by manganese deficiency in corn

Photo 3. Field view of Mn deficiency on corn

Photo 4. Field view of Mn deficiency with normal corn in the upper left corner near the woods

For this field, there was a significant difference in the soil organic matter content between the affected areas (2.9%) and the healthier areas (8.9%) (Table 1). Tissue testing of the affected corn plants (Table 2) showed that Mn was deficient while all the other nutrients were either in the sufficient range or higher than the sufficient range. This raised some interesting questions. The good corn soil sample actually contained a lower concentration of manganese than the bad corn soil sample and the soil water pH and percent hydrogen saturation of the soil sample from the good areas showed a greater amount of soil acidity than for the soil sample from the bad areas. The very high organic matter content of the good sample allowed corn growth at the low soil pH (4.9) and the chelating compounds available from the large amount of organic matter helped the plants obtain enough Mn for normal growth. In the lower organic matter areas, Mn availability suffered and was not overcome by the higher level of soil test Mn.

Table 1. Soil Test Results Including (*) Percent Base Saturation for Good and Bad Corn Areas

	Good Corn	Bad Corn
Soil pH 1:1	4.9	6
Buffer pH	6.3	6.8
Organic Matter %	8.9	2.9
U of D P Sat Ratio	12	32
Mehlich 3 Phosphorus ppm P/FIV	54	126
K ppm	229	161
Ca ppm	1340	1480
Mg ppm	191	191
SO4-S ppm	41	31
Zn ppm	3.52	3.8
Mn ppm	2	4.4
B ppm	0.98	0.98
CEC meq/100 g soil	16.1	11
H*	45	15
K*	4	4
Ca*	41	67
Mg*	10	14
Na*	0	0

* Base saturation for each of the cations is given in percent of CEC occupied by that cation.

Table 2. Tissue Sample Results for Manganese Deficient Corn Plants

	Corn Sample	Sufficiency Range
N (%)	4.25	
P (%)	0.57	0.20-0.50
K (%)	4.73	1.50-3.00
Ca (%)	0.52	0.3-1.20
Mg (%)	0.29	0.15-0.50
S (%)	0.39	0.15-0.40
Mn mg/kg	16.0	25-100
Zn mg/kg	23.0	15-70
Cu mg/kg	14.9	5-25
Fe mg/kg	110	NA
B mg/kg	8.0	NA

Interpretation of values based on top of the plant.

In the final analysis, the health of the crop returns to both frequent scouting to pick up problems such as this and to emergency foliar application of manganese, either as a chelated Mn or as manganese sulfate. An application of 0.5 to 2 lbs of Mn per acre should support the corn plant until the root system has penetrated deep enough in the soil to reach the more acidic subsoil where Mn availability is likely to be greater. The exact rate depends on the size of the corn plants, the amount of coverage possible with the intended sprayer, the stress level the corn is under at application time, and the willingness of the grower to possibly make a second application if the first application is not sufficient.

Grain Marketing Highlights - *Carl German, Extension Crops Marketing Specialist*; clgerman@udel.edu

Corn Drops Limit on Long Liquidation

Nearby and new crop corn futures dropped the daily limit (30 cents) on Wednesday which leads to an expansion of the limit in today's trade (45 cents per bushel). Several reasons have been cited for the sell-off, among them, a favorable Corn Belt weather forecast for the next 7 to 10 ten days, huge financial concerns around the globe including the situation in Greece, and the huge sell-off by fund buyers in the commodity markets. DTN reports that by the end of the day Wednesday 100,000 sell orders were waiting to be cleared. The Dow also took a big hit yesterday, nearly wiping out recent gains.

General economic concerns in the U.S. and World continue to outweigh the fundamentals at this point in time. Attention now turns to the Planted Acreage and Grain Stocks in All Positions reports to be released next Thursday, June 30.

USDA Export Sales Report 06/23

Pre-report estimates for weekly export sales of soybeans ranged from 5.5 to 14.7 million bushels. The weekly report showed total old-crop and new-crop export sales of 7.5 million bushels, below the O.2 million bushels needed this week to stay on pace with USDA's demand projection of 1.54 billion bushels. Total shipments of 6.8 million bushels were below the 13.1 million bushels needed.

This report should be considered bearish.

Pre-report estimates had weekly corn export sales at 23.6 to 49.2 million bushels. The weekly report showed total old-crop and new-crop sales of 20.6 million bushels, with old-crop sales of 16.2 million bushels, above the 13.7 million bushels needed this week to stay on pace with USDA's demand projection of 1.9 billion bushels. Total shipments of 46 million bushels were above the 44.5 million bushels needed. This report should be considered bullish.

Pre-report estimates for weekly wheat export sales ranged between 11 to 25.7 million bushels. The weekly report showed total export sales of 24.3 million bushels, above the 15.5 million bushels needed this week to stay on pace with USDA's 1.05 billion bushel demand projection. Total shipments of 24.3 million bushels were above the 20 million bushels needed this week. This report should be considered bullish.

Market Strategy

Currently, Dec '11 corn futures are trading at $6.22; Nov '11 soybeans at $13.20; and July '11 SRW wheat at $6.21 per bushel. Using options may be beneficial to any pricing decisions needing to be made at this point in time, specifically for new crop corn or soybeans.