Soybean Rust Update

Tropical Storm Ernesto will increase the risk of soybean rust in Delaware and the region. If you heard our talks over the last two seasons we always mentioned that it takes live spores, susceptible plants and favorable weather for disease to develop, and to move longer distances it takes a lot of spores at the source. Florida has had good weather lately for disease development and it is thought there might be enough for movement out of the southeast. Now we have a weather system (Ernesto) with plenty of rain for deposition of the spores and wet leaves that favor infection. So we have a possible event that might bring soybean rust this far north. Much will depend on the number of spores available for transport, and how far they carry and how much deposition there is along the way. So far the forecasters are saying the risk of deposition extends to southeast PA, including DE and MD. If there is any deposition here and infection, we could see the first symptoms in another week.

Remember that once soybeans have reached R6 they are not at risk from soybean rust (See Richard Taylor’s article on the R5 and R6 growth stages reprinted in the Agronomy Section). It is the late planted and double-crop beans that might be affected the most. Unfortunately the podworm outbreaks have growers spraying for those pests, and now there is the risk of soybean rust. Not a good situation. Samples will be pulled next week from the sentinel plots, as we have been doing all season, and incubated in hopes of detecting the disease early enough to give plenty of warning to growers. We also will be checking with colleagues to our south to see what they are finding. If soybean rust is found close to us we will not wait to detect it here before suggesting spraying if we think Delaware growers are at risk. It will then be up to growers to decide what action to follow. We are not out of the woods yet. We will have to wait and see what happens. It is much more likely to increase rust in the Southeast but how far north it will move depends on spore numbers and the weather system. We are not suggesting spraying at this time. Keep in touch with developments by visiting the PIPE website http://www.sbrusa.net/. Fungicide choices and labels are available at our website http://ag.udel.edu/extension/pdc/soybeanrustResources.htm

Bob Mulrooney

Vegetables

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

Cabbage
We continue to find economic levels of beet armyworm, fall armyworm, diamondback and cabbage looper larvae. Be sure to apply treatments before larvae move deep into the hearts of plants.
**Lima Beans**
Continue to scout all fields for lygus bugs, stinkbugs, corn earworm, fall armyworm and beet armyworm. The higher labeled rates of insecticides will be needed for stinkbug control. For the worm pests, higher rates will also be needed if population levels are high and worms are large at the time of treatment.

**Peppers**
Be sure to maintain a 5 to 7-day spray schedule for corn borer, corn earworm, beet armyworm and fall armyworm control. In addition to high corn borer and corn earworm moth flights, beet armyworm larval populations and fall armyworm trap catches have also exploded in some areas. We continue to see an increase in aphid populations. Treatments should be applied before populations explode.

**Snap Beans**
Sprays are needed at the bud and pin stages on processing beans for corn borer control. An earworm spray will also be needed at the pin stage. With the continued high corn borer and corn earworm moth pressure, you will need to treat for both insect pests from the pin stage until harvest. In addition, the highest labeled rates may be needed if population pressure is heavy in your area. Remember, Orthene will not provide effective earworm control. In general, after the pin spray, treatments are needed on a 4-day schedule in Harrington and Sussex County and on a 5-day schedule in Kent County until harvest. However, be sure to scout fields at least twice a week for corn earworm to be sure that a tighter schedule is not needed between the pin spray and harvest. Also, since trap catches can change quickly, be sure to check our website for the most recent trap catches to decide on the spray interval between the pin stage and harvest for processing snap beans ([http://ag.udel.edu/extension/IPM/traps/latestblt.html](http://ag.udel.edu/extension/IPM/traps/latestblt.html) and [http://ag.udel.edu/extension/IPM/thresh/snapbeanecbthresh.html](http://ag.udel.edu/extension/IPM/thresh/snapbeanecbthresh.html)). Once pins are present on fresh market snap beans, a 5-day schedule will be needed for corn borer and corn earworm control.

**Spinach**
Be sure to watch for webworms and beet armyworms as soon as plants emerge. Controls should be applied when worms are small and before they have moved deep into the hearts of the plants. Also, remember that both insects can produce webbing on the plants.

**Sweet Corn**
Be sure to maintain a 2-day schedule on all fresh market silking sweet corn.

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**Downy Mildew on Limas** - Bob Mulrooney, *Extension Plant Pathologist*; [bobmul@udel.edu](mailto:bobmul@udel.edu)

The upcoming weather change could provide weather conditions that will favor downy mildew. Scouting should continue and fungicides should be applied if necessary. Plants that are flowering, producing pins, and have a few flat pods present are the most at risk of yield limiting infections if downy gets going in a field. Fungicide options include fixed coppers, Ridomil Gold/Copper ([http://www.cdms.net/ldat/ld186002.pdf](http://www.cdms.net/ldat/ld186002.pdf)) and Phostrol ([http://www.rec.udel.edu/Update06/Phostrol24c.pdf](http://www.rec.udel.edu/Update06/Phostrol24c.pdf)). For more info see issue 19 of WCU. [http://www.rec.udel.edu/Update06/Voume14,Issue19.htm](http://www.rec.udel.edu/Update06/Voume14,Issue19.htm)

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**Agronomic Crops**

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**Agronomic Crop Insects** - Joanne Whalen, *Extension IPM Specialist*; [jwhalen@udel.edu](mailto:jwhalen@udel.edu)

**Alfalfa**
Continue to sample fields on a weekly basis for leafhopper adults and nymphs as well as defoliators.

**Soybeans**
Continue to scout double crop soybeans for defoliators including grasshoppers, bean leaf beetles and green cloverworm. Once fields reach the bloom to pod-fill stage the threshold drops to 15% defoliation.
You should also continue sampling fields for soybean aphids. The action threshold - developed in the Midwest - is an average of 250 aphids per plant, on plants sampled throughout the field. In the Midwest, spraying at or beyond R6 has not been documented to increase yield.

Be sure to continue to sample all fields that are in the pod development and pod fill stages for stinkbugs. We are currently following the same treatment guidelines that are being used in Virginia: 1 large nymph/adult (either brown or green stinkbug) per row foot if using a beat sheet, or, 2.5 per 15 sweeps in narrow-row beans, or 3.5 per 15 sweeps in wide-row beans.

**Corn Earworm Alert for Soybeans - As a result of the continued high corn earworm moth pressure, economic levels of corn earworm larvae can be found in numerous double crop soybean fields in lower Kent and Sussex Counties. In addition, moths can be found laying eggs in fields in New Castle County. In some fields in Sussex County, larval numbers are extremely high and larvae can be readily found feeding on leaves, flowers and pods. In many cases, mixed sizes of larvae can be found in fields. However, since populations are still varying from field to field, the only way to know if you have an economic level will be to scout. In a number of cases, one field will have high levels and an adjacent field will have very low levels. However, larval infestation levels are changing on a daily basis; therefore - BE SURE TO SCOUT ALL FIELDS FOR PODWORMS, ESPECIALLY DOUBLE CROP FIELDS.** A treatment should be considered if you find 3 corn earworm larvae per 25 sweeps in narrow fields or 5 per 25 sweeps in wide row fields (20 inches or greater). The following materials are labeled for corn earworm control in soybeans: Asana, Baythroid, Mustang MAX, Proaxis, Warrior (all pyrethroids), Larvin, Lorsban, or Steward. As a reminder, the mid-rate of the pyrethroids should be used since population pressure is heavy and in many cases treatments will be applied when a mixture of larval sizes are present in fields. Larvin and Steward act by ingestion on both small and large larvae. Remember that if you are using a pyrethroid, the primary mode of action on large larvae will be ingestion.

Earworns will need to feed to cause death so you will not see immediate activity from the contact action. Once they ingest the product, they immediately stop feeding. Therefore, fields should not be evaluated for control until 4 days after application. Small larvae are generally killed by contact as well as ingestion. It is important that you do not look at fields 1-2 days after spraying and assume control failure if large worms are present. This could result in unnecessary re-sprays. We are also finding beet armyworms in some fields. **If the predominant pest is beet armyworm (BAW), the pyrethroids will not provide control.** Steward will provide effective BAW control. In addition, Intrepid received a soybean label this year and will provide effective BAW control. In grower demonstration trials in 2002, Lorsban also provided good BAW control. Be sure to check all labels for the days from last application to harvest as well as other restrictions.

**Estimating Corn and Soybean Yields - Richard Taylor, Extension Agronomist; rtaylor@udel.edu**

There are a number of methods for estimating corn and soybean yields and their accuracy depends on how much trouble you want to go to when coming up with the items used in determining the estimate. The more sites selected and the better the representation of the field, the more accurate the estimate. For corn, a yield estimate can be determined anytime after the milk stage although actual yield can be affected by factors, such as drought, that impact kernel size. By the dent stage, yield estimates should be fairly accurate for corn. Soybean yield estimates can be made from R6 or full seed stage onward but again late-season stresses can significantly change the accuracy of the estimate.

For corn, choose a minimum of 10 sites from a field and choose some good areas, bad areas, and average areas trying to obtain as representative a sample of the field as you can. At each site measure a length of row based on
the row spacing (for 30-inch rows use 17'5" of row, for 36-inch rows use 14'6" of row, for 20-inch rows use 26'1.6" of row). Within this length of row count the number of harvestable ears and select one average sized ear. On this ear count the number of kernel rows (typically 12 to 18) at the mid-point of the ear and the number of kernels per row (typically 30 to 50). Now multiply as follows:

\[
\text{(# Kernels/row)} \times \text{(# rows per ear)} \times \text{(# ears per row length chosen based on row spacing)} \times \frac{0.01116}{15.5\%} = \text{Estimated Yield in bushels per acre adjusted to 15.5\% moisture.}
\]

For example on 30 inch rows, you select sites of 17'5"of row and find that there are on average 23.2 ears per site and that these ears average 12 rows with 32 kernels per row (having ignored the tiny kernels at the very tips of the ear just to be conservative). The yield estimate you have come up with is \(32 \times 12 \times 23.2 \times 0.01116\) or 99.4 bu/A.

For soybeans, the procedure is roughly similar although there often is more flex (variability) in some of the assumed components such as seed size (seeds per pound) and seeds per pod since these can be significantly impacted by environmental and other factors as the plants mature.

First measure the length of row to be observed in at least ten locations in the field based on the following table.

<table>
<thead>
<tr>
<th>Row spacing</th>
<th>Row length to measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-inch rows</td>
<td>87 feet 1.4 inches</td>
</tr>
<tr>
<td>7-inch rows</td>
<td>74 feet 8.1 inches</td>
</tr>
<tr>
<td>7.5-inch rows</td>
<td>69 feet 8.4 inches</td>
</tr>
<tr>
<td>8-inch rows</td>
<td>65 feet 4.1 inches</td>
</tr>
<tr>
<td>10-inch rows</td>
<td>36 feet 3.6 inches</td>
</tr>
<tr>
<td>12-inch rows</td>
<td>43 feet 6.7 inches</td>
</tr>
<tr>
<td>15-inch rows</td>
<td>34 feet 10.2 inches</td>
</tr>
<tr>
<td>18-inch rows</td>
<td>29 feet 0.5 inches</td>
</tr>
<tr>
<td>20-inch rows</td>
<td>26 feet 1.6 inches</td>
</tr>
<tr>
<td>22-inch rows</td>
<td>23 feet 9.1 inches</td>
</tr>
<tr>
<td>24-inch rows</td>
<td>21 feet 9.4 inches</td>
</tr>
<tr>
<td>28-inch rows</td>
<td>18 feet 8 inches</td>
</tr>
<tr>
<td>30-inch rows</td>
<td>17 feet 5 inches</td>
</tr>
<tr>
<td>32-inch rows</td>
<td>16 feet 4 inches</td>
</tr>
<tr>
<td>36-inch rows</td>
<td>14 feet 6.25 inches</td>
</tr>
<tr>
<td>40-inch rows</td>
<td>13 feet 0.82 inches</td>
</tr>
</tbody>
</table>

Count the number of harvestable plants in the correct length of row in the ten locations and obtain the average number of plants per row length. Multiply this number by 1,000 to obtain the number of plants per acre. Choose two or more representative plants from these locations and count the number of pods per plant, divide by the number of plants, and obtain the average number of pods per plant. Next, multiply the numbers obtained as follows:

\[
\text{(average # pods/plant)} \times \text{(# plants per acre)} \times \frac{(2.5 \text{ seeds/pod})}{(3,000 \text{ seeds/lb})} \div (60 \text{ lbs/bu}) = \text{bushels per acre}
\]

For example, on 15-inch row spacing you counted an average of 145 plants in 34 feet 10.2 inches of row (times 1,000 equals 145,000 plants per acre) and an average of 25 pods per plant. Your estimated yield would be:

\[
(25 \text{ pods/plant}) \times (145,000 \text{ plants per acre}) \times \frac{(2.5 \text{ seeds/pod})}{(3,000 \text{ seeds/lb})} \div (60 \text{ lbs/bushel}) = 50.3 \text{ bushels per acre Estimated Yield}
\]

Please note that for the soybean yield estimate, we are using an average seed size and an average seed number per pod. You can improve this estimate possibly by counting the number of seeds per pod on the selected plants and dividing by the number of pods on the plants to obtain a better estimate of seeds per pod. Seed size is something not completely determined until close to physiological maturity or between the R7 and R8 growth stages but if growing conditions have been excellent (irrigated beans for example) you might lower the seeds/lb number to 2400 or if the crop has been injured by drought and the seed size is likely to be very small you can increase this number to 3600 to 4000 to account for these factors.
Understanding Soybean Growth Stages:
VIII. R5 and R6 - Beginning Seed and Full Seed - Richard Taylor, Extension Agronomist; rtaylor@udel.edu

The R5 or Beginning Seed stage occurs when on 50% or more of the plants in a field you can find a seed $\frac{1}{8}$ of an inch long (just slightly greater than 3 mm) in a pod at one of the four uppermost nodes on the main stem with a fully developed leaf (Photo 1). This occurs in pods earlier than we often think (Photo 2) as pods may be only an inch long. The tendency for most of us is to wait to call a plant in the R5 stage when we can either easily see the seed developing in the pod or can easily feel the seed in the pod. Usually by this point, the seed has grown to about a $\frac{1}{4}$ inch in length.

The R6 or Full Seed stage begins when a pod that contains a green seed, which fills the pod cavity, occurs at one of the four uppermost nodes on the main stem with a fully developed leaf (Photo 3). Again, one-half of the plants in the field must be at this stage. It often seems that this stage lasts longer than the other reproductive stages. Towards the end of R6, soybean leaves begin to show a bright yellow color and begin to drop off the plant as senescence of the crop begins (Photo 4).
Photo 4. Soybean leaf drop begins towards the end of growth stage R6 and often shows up as an intense yellowing of the field.

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

'The Good, the Bad, and the Ugly' of Commodity Trading

We have entered another one of those periods of time in commodity trading that could be thought of as 'The Good, the Bad, and the Ugly', as stated above, or to rephrase the same line of thinking we could entitle this column 'The Ifs, the Ands, and the Buts of Commodity Trading'. Specifically, 'the good' has to do with the fact that, lead by the strong rally in wheat, new crop corn and soybeans went up, instead of down in Wednesday's trading. Reasoning given: Large buying activity in the wheat market that carried into the corn and soybean trading pits. Traders are beginning to realize that wheat and corn stocks will be pulled down within the current marketing year getting tighter as we enter into the '07/'08 marketing year. Additionally, traders may be backing off of USDA's August U.S. corn yield estimate of 152.2 bushels per acre, which might be reason not to take corn prices down as low as originally expected. The fundamentals are said to justify a CBOT Dec corn price of approximately $2.15 to $2.25 per bushel at the 152 bushel per acre production level. Therefore, a lower U.S. production number would likely add some value to the new crop corn price. A part of 'the ugly' at the present time in commodity trading has to do with the age old problem of which number do we work with? Generally, USDA's forecast numbers become the final word in commodity trading. Technically speaking the commodity markets for corn, soybeans, and wheat are oversold. Another reason for Wednesday's jump in prices may be that a correction is taking place. A five-wave buy signal occurred in the corn market at mid-week last week further signaling that a correction may be in order. What this should mean is that prices can regain or recover a part of the sell-off that has occurred over the past three weeks before returning attention to the '06 harvest with prices moving lower through harvest based upon fundamental factors in the market.

A part of 'the bad' has to do with the fact that U.S. corn, soybean, and wheat supplies are adequate to meet '06/'07 demand and still have stocks to carry into the '07/'08 marketing year. Currently, commodity traders are said to be thinking in terms of a slightly larger U.S. soybean production number, estimated at 39.6 bushels per acre last month. Ultimately, new crop soybean futures could slide down to the $5.00 per bushel level as harvest pressure builds and attention mounts around '06 U.S. production and supply.

Another part of 'the ugly' has to do with the fact that one can never be to sure as to what the non-commercial (speculative) funds might do. It is the non-commercials that have an interest in buying or going long in wheat futures at the present time. Of course this phenomenon of commodity trading and price discovery has all of the elements of our stated title. It is 'good' that this type of trading creates volatility, generally, taking prices higher or lower than they should have gone at a particular point in time. It is 'bad' if a grain marketer's market position gets caught on the wrong side of one of these price moves, and it gets 'ugly' when the fundamentals, commercial traders, technicals, and non-commercial do not line up causing prices to drop and basis to widen. However, it is important to note that commodity markets will eventually trade toward equilibrium based upon the fundamentals (supply and demand). That is
what is expected to happen as the '06 U.S. corn and soybean harvest progresses.

**Marketing Strategy**
Commodity traders are not likely to find a clear direction concerning corn and soybean prices until the September 12th report. In the meantime, we can expect some price volatility that can help those needing to complete pre-harvest '06 corn, and soybean sales. The volatility in commodity trading, at the present time, stems from rumors of dry conditions in wheat and corn producing countries in other parts of the world, uncertainty about '06 U.S. corn and soybean production (Will yields be bigger or smaller than the August estimates?), along with rejuvenated fund interest in wheat futures (with spill over impacting other commodity prices). Currently, new crop Dec '06 corn is trading at $2.43 per bushel; Nov '06 soybeans at $5.52 per bushel; and Dec '06 wheat is at $4.16 per bushel. Dec '07 corn is trading at $2.92; Nov '07 soybeans are trading at $6.16; and Jul '07 wheat is at $4.47 per bushel. For technical assistance on grain marketing decisions contact Carl L. German, Extension Crops Marketing Specialist.

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**Announcements**

**Severe Deer Damage Assistance Program (SDDAP)**

Permits obtained through the Severe Deer Damage Assistance Program will allow antlerless deer to be harvested from August 15, 2006 through May 15, 2007 on enrolled farms.

For more information on enrolling in the SDDAP, contact Joe Rogerson with the Division of Fish and Wildlife at (302) 653-2882.

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**Weather Summary**

http://www.rec.udel.edu/TopLevel/Weather.htm

**Week of August 24 to August 30, 2006**

**Readings Taken from Midnight to Midnight**

**Rainfall:**
0.04 inch on August 28, 2006
0.13 inch on August 29, 2006
0.02 inch on August 30, 2006

**Air Temperature:**
Highs ranged from 92°F on August 25 and August 29 to 75°F on August 30.
Lows ranged from 75°F on August 27 to 65°F on August 24.

**Soil Temperature:**
81°F average.
(Soil temperature taken at a 2” depth, under sod)

*The Weekly Crop Update is available online at http://www.rec.udel.edu/TopLevel/Publicat.htm*

*Weekly Crop Update is compiled and edited by Emmalea Ernest, Extension Associate - Vegetable Crops*

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