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Insects, Mites, And Nematodes

Pheromone Traps Have Detected Black Cutworm Arrival – (*Christian Krupke and John Obermeyer*)

- This pest is beginning its annual invasion to the Midwest.
- Moths arriving in mid to later April pose the greatest threat to crops.
- Heat unit accumulations from date of intense captures helps plan scouting activity.

Although at just detectable levels, black cutworm moths are beginning their arrival into the Midwest from sites in south Texas and northern Mexico. Warm, moist air currents sweeping up from the Gulf Coast literally lift these moths up into the upper atmosphere and carries them into Midwestern states. The direction that these weather systems track and the number of moths that are carried within them will determine whether they are brought into our area and whether or not they will pose a threat to our crops.

Black cutworm pheromone trap

As in the past, black cutworm pheromone trap cooperators located throughout the state will monitor moth arrival. As we approach the more critical times for moth activity, that being mid to later April, we will be watching for what we refer to as an "intense capture." This is when 9 or more moths are caught in a trap over a two-day period. When and if this occurs, we will begin accumulating heat units (HU base 50°F) to determine when the first cutting of corn by the larvae should occur. This occurs approximately 300 HU after the intense capture. Watch for this information and Black Cutworm Adult Pheromone Trap Reports in future issues of the *Pest&Crop*.

Bt-Rootworm Corn and Protecting Refuge Acres from Damage – (*Christian Krupke, John Obermeyer, and Larry Bledsoe*)

- Planting of refuge with Bt-Rootworm corn is necessary and crucial to prevent resistance.
- Misinformation and creativity abound concerning refuge acres.
- Protecting refuge acres from rootworm feeding can be a challenge, especially in high-risk rootworm damage areas.

Bt-Rootworm corn's popularity and use continues to increase. Hopefully all who are planting this technology understand and will implement EPA's mandated refuge. This is important for 2 reasons: First, it is the law. Second, not using refuges could have disastrous consequences in the long-term for growers, due to insect resistance. The refuge is crucial to preserve the longevity of this technology. There are few guarantees in agriculture, but one is that insects will always evolve and adapt to counteract whatever we throw at them. The other guarantee is that once resistance occurs, it will be on commercial farms, not in research plots or laboratories.

The refuge must comprise 20% of the production field where Bt corn is used. The 80/20 arrangement of the field is quite flexible, but using the neighbor's corn as a refuge is NOT. Options include planting the refuge in blocks, strips throughout, or end rows all are acceptable as long as it equals or exceeds 20% of the field's total acreage. The idea behind each of these arrangements is that beetles emerging from Bt-Rootworm corn (yes, there are survivors) will mate with beetles from the refuge.

Protecting refuge corn from rootworm feeding has presented some challenges for producers. They have shared a wide range of thoughts on this from providing no protection for the refuge, to mixing Bt and refuge seed in the seed boxes, and mounting insecticide boxes that may or may not be approved by the equipment manufacturer. In moderate to high-risk rootworm areas, 20% of a field is worth protecting from the rootworm's potentially devastating damage.

Despite some confusion about changing refuge requirements, mixing Bt and refuge seed ("refuge-in-the-bag") is not legal at the present time. In short, the regulations and legal requirements concerning the arrangement and percentage of refuge are the same as they were in 2006/07/08 – nothing has changed at this point. If and when new options become legal, we will update using the newsletter and other venues.

Therefore we are still left with planting and protecting the refuge separately from the rest of the field. This entails using granular, liquid or seed-applied insecticides. The newer John Deere planters have eliminated granular insecticide units, although they can be "plumbed" for liquid soil insecticides. Some of these planters have been successfully retrofitted with SmartBox® systems that fall within the manufacturer's weight tolerances. Splitting the planter with Cruiser Rootworm or Poncho 1250 seed-applied insecticides is possible with planters that have row seed boxes, but may not be possible with bulk seed boxes. Also, it should be mentioned that low rates of the seed-applied insecticides (Poncho 250, for example) do NOT control rootworms. Rootworm product efficacy should be considered depending of the anticipated risk to damage. In general, liquid soil insecticides and seed-applied insecticides perform poorly under high rootworm pressure. Granular insecticides are still the best bet to protect a refuge that is under high pressure.

Should the refuge remain untreated at planting time and damage is anticipated or noticed, rescue treatments are still a possibility. Liquid insecticides (i.e., Furadan, Lorsban) can be applied at post-emergence or cultivation-time. Obviously planting the refuge in a block design that is well marked will help in treating the unprotected corn. Shortly before rootworm egg-hatch, about the third week of May, drop nozzles should be directed toward the base of the corn plants with the labeled rate of insecticide. Following-up with cultivation will incorporate the insecticide and promote the establishment of brace roots. Weather is often a limiting factor in getting post-emergence insecticides applied in a timely manner.

Weeds

Reducing Spray Drift from Glyphosate and Growth Regulator Herbicides – (*Tom Jordan, Glenn Nice, Bill Johnson, and Tom Bauman*)

If Indiana was the land of perfect, you would be able to pull into a field that had a dry surface, the temperature would be 75°F and the wind would be only 2 -3 MPH without a chance of a temperature inversion ever occurring. Weeds would never be over 2-3 inches tall and the corn would be in the V4 stage and soybeans plants would have 2-3 trifoliolates. But, since we don't live in the land of perfect, we have to deal with conditions that are not always ideal for spraying herbicides.

One of the biggest concerns of herbicide applications in the spring of the year is off-target drift. Managing spray applications to minimize drift is something that should take top priority in the total herbicide management scheme. Drift reduces product efficacy, damages crops that are economically or aesthetically important, hurts wildlife, and contaminates water supplies. Herbicide drift can also deposit illegal residues on eatable crops, especially organic grown crops or processed crops that are checked for contaminants.

There Are Two Types of Drift:

1. Vapor drift - which is related to the product formulation (ester vs. amine), temperature, relative humidity and is not a function of the application method or equipment, and
2. Particle drift – which is a function of the application method and equipment. The key factors associated with particle drift are:
   a. Droplet size
   b. The equipment and operation technique
   c. Wind speed and direction and climatic conditions

The simplified difference between vapor drift and particle drift is that with vapor drift, the application reaches its target and then moves off target some time after application. In the case of particle drift, the portion that moves off-target does not reach its target.

Particle Drift

Particle drift occurs with all pesticide applications, regardless of the product or formulation, and is directly associated with droplet size in combination with boom height and wind speeds. Injury symptoms from drift will depend on the product used, environmental conditions, and sensitivity of the plants in the path of air flow. Low concentrations of glyphosate may or may not show injury symptoms while low concentrations of 2,4-D or dicamba may show major symptoms on sensitive plants. Controlling droplet size by choosing the proper nozzles and operating the equipment at the proper pressures will minimize drift problems more than anything else within the operator's control.

For burndown and early season applications, selecting nozzles that produce medium to course size droplets (220 – 400 microns) will provide good herbicide coverage. Operating the sprayer at 30 to 40 psi will usually provide the maximum droplets in this range. Obviously the pressure range will also depend in the nozzle type. Some wide-angle nozzles with pre-orifice or air-assist designs will allow pressures to be greater than other nozzles designs, while extended range flat-fan nozzles can be operated at lower pressures.

In "A Summary of Ground Application Studies" by the Spray Drift Task Force, a consortium of 38 agricultural chemical companies, reported that the average loss of active ingredient was approximately 0.5% with a 10 mph cross wind[1]. However, it should be noted that in Indiana winds and gusts of wind can often surpass 10 mph.

The most common ways to reduce herbicide drift onto susceptible crops or sensitive areas are:

1. Use the lower end of the pressure recommended range for that particular nozzle to produce course droplets
2. Lower the boom height – but, ensure that the spray pattern is maintained
3. Instead of increasing pressure to provide higher outputs, increase the nozzle size to increase the spray volume/acre while keeping within the recommended pressure.
4. Spray when the wind speeds are less than 10 MPH. Some labels, such as Banvel® provide a specific wind speed (15 MPH).
5. Spray when the wind direction is away from sensitive areas
6. In case of volatile herbicides like growth regulators, do not spray when there is no wind; this may suggest that an inversion is present.
7. Use a drift control agent if possible

Vapor Drift

Vapor drift is much harder to control than particle drift. Vapor drift is a function of the herbicide formulation and ambient temperature. In 1979, E. Behrens and W.E. Lueschen investigated dicamba drift using a closed system of bell jars; not quite field conditions, however, it provided some indication of how temperature can affect volatility of dicamba[2]. As temperature increased from 59°F to 86° F, visual symptoms on soybean increased from almost 0% to 40%. The same study looked at dicamba formulation and reporting that the dimethylamine and methylamine salts of dicamba produced the most injury in soybean. The sodium, lithium, and potassium salt did not produce any visual injury symptoms under the same conditions. The most common vapor drift of 2,4-D comes from ester formulations, but can also be seen from other herbicides like Command. Ester formulations of herbicides volatilize at temperatures of 70°F or greater, and if calm conditions exist creating an inversion layer, these herbicides can drift for more than one mile. When volatile herbicides are applied in the spring, soil surface temperatures can be 10 – 15°F hotter than the air temperature, especially in mid-afternoon, increasing the possibility of volatilization. The Indiana State Climate Center indicated that inversion layers occur an average of 20 times per month during the periods of April through July but those strong enough to cause long distance herbicide drift occur, on average, between 6 and 8 times during the period of mid-April and mid-May in Indiana, while occurring only 1 or 2 times in June –July. This long distance movement usually occurs at night as the air temperature cools and there is light air movement. When such days occur, being aware of a volatile herbicide's ability to vaporize can help the applicator manage a potential drift problem by either not spraying until conditions improve or by choosing a formulation of the product that is less subject to volatilization.

Volatile herbicides are not unique to long distance movement. Any herbicide that is part of a spray droplet of 100 microns or less, which can be produced when spray pressures are increased over normal recommended ranges for that particular nozzle, can become an aerosol particle that is suspended in the air and will likewise move long distances with high winds or by a temperature inversion layer. On a calm day with low relative humidity a droplet of 100 micron or less will evaporate in less than 6 seconds and the herbicide molecules will suspend in the air similar to smoke. For example, at 90°F and 36% RH, a 50 micron droplet will travel only about 3 inches from the nozzle and evaporate in less than 2 seconds. These suspended molecules can then move horizontally for very long distances before being deposited on off-target areas. Once the dry molecules are rehydrated by wet leaves, they can then be absorbed by leaf tissue. If the herbicide residue is from an herbicide that has enough activity, it can cause injure symptoms to sensitive crops. These are usually herbicides like growth regulators (ester or amine), bleachers like Command, or contact herbicides like paraquat. Other herbicide chemistries may or may not show symptoms.

References

1) Spray Drift Task Force. 1997. A Summary of Ground Applications Studies. Agricultural Research Services, Inc., P.O. Box 509, Macon, Missouri 63552.

2) Behrens, R. and W.E. Lueschen. 1979. Dicamba Volatility. Weed Science 27:486-493

Weed Management in Wheat – (*Bill Johnson and Glenn Nice*)

The most common broadleaf or perennial weed problems we run into at this time of year in Indiana wheat include chickweed, deadnettle, henbit, dandelion, mustards, field pennycress, shepherdspurse, Canada thistle, and wild garlic. The most common grass problems are annual bluegrass, annual ryegrass, cheat, and downy brome. Some of the commonly used herbicides, rates, their application timings, and weeds controlled are listed in the table below.

It is important to be aware that restrictions exist concerning application timing of these herbicides to avoid crop injury. Phenoxy herbicides, such as 2,4-D and MCPA, control a number of annual broadleaf weeds and are the least expensive of these herbicides to use. However, proper application timing of the growth-regulating herbicides 2,4-D, MCPA and Banvel is critical to avoid crop injury and possible yield losses. These herbicides can cause substantial crop injury and yield loss in small grains if applied before tillering begins or after development of the grain heads have been initiated.

The exact time at which grain heads have been initiated is not easy to determine, but this event always just precedes stem elongation. The occurrence of stem elongation can be easily detected by the appearance of the first node or "joint" above the soil surface, commonly referred to as the "jointing stage." Pinch a wheat plant stem at the base between the thumb and forefinger and slide your fingers up the stem. The presence of a node or joint will be felt as a hard bump about an inch above the soil surface. Slicing the stem lengthwise with a sharp knife will reveal a cross section of the hollow stem and solid node. If jointing has occurred, applications of 2,4-D, MCPA and Banvel should be avoided because crop injury and yield loss are likely. Research from the University of Missouri Weed Science program has shown a 3- to 6-bushel per acre yield loss from 2,4-D and Banvel applications to wheat after the jointing stage. MCPA alone at labeled rates should be applied before jointing. However, the amount of MCPA applied in Bronate, a combination of bromoxynil and MCPA, is low enough to permit later applications.

Many wheat fields in Indiana contain wild garlic and wild onion. Although not considered as strong competitors with a wheat crop, wild garlic (*Allium vineale*) and wild onion (*Allium canadense*) are both responsible for imparting a strong odor to beef and dairy products. Wheat producers and grain elevator operators are very familiar with dockages that occur with the presence of wild garlic or onion bulbs in their harvested grain. Found throughout Indiana, wild garlic is a native of Europe, while wild onion is native. Despite the fact that these perennials both occur in similar habitats, wild garlic occupies the majority of small grain settings, including wheat.

Control measures for wild onion and wild garlic will differ. Producers, consultants and industry personnel will want to make certain that they are able to distinguish between these two weed species. The vegetative leaves of wild garlic are linear, smooth, round and hollow. The flowering stems are solid. A major difference with wild onion is that its leaves are flat in cross section and not hollow. Another varying feature are the underground bulbs. Wild garlic's bulbs have a thin membranous outer coating while wild onion's bulbs have a fibrous, net-veined coating.

Harmony Extra (thifensulfuron + tribenuron) is the herbicide most commonly used for control of garlic in wheat, plus it controls a relatively wide spectrum of other broadleaf weeds and possesses a fairly wide application window. Harmony GT (thifensulfuron) also has activity on wild garlic, but is considered to be slightly weaker than Harmony Extra. Peak is also labeled and effective on wild garlic in wheat, but it is fairly persistent in soil. The Peak label does not allow one to plant double crop soybean following wheat harvest in Indiana. Wild onion is controlled with 2,4-D. Keep in mind that both of these weeds are perennials and the full labeled rate is needed for adequate control.

Over the last couple of years, dandelion infestations in wheat have increased dramatically, particularly in the eastern part of Indiana. The best dandelion control is usually obtained with fall applications of glyphosate before wheat is planted. So keep this in mind for fields that will be planted to wheat in coming fall. For this spring, the best approach to dandelion management in wheat will be the higher rates of 2,4-D, Stinger, or Curtail. Stinger will have the widest application window and can be applied up until the boot stage.

Finally, we now have a couple of grass herbicides labeled for use in Indiana wheat, Axial and Osprey. Osprey controls annual bluegrass and annual ryegrass; while Axial controls ryegrass, foxtails, and barnyardgrass.

Table 1. Herbicides to control broadleaf weeds in winter wheat.

Active Ingredient	*Trade Name(s)*	*Rate Per Acre*	*Application Timing*	*Broadleaf Weeds Controlled*[1]	*Grasses Controlled*
2,4-D	Weedar, Weedone, Formula 40, others	1 to 2 pts	Tillering to before jointing	Prickly and wild lettuce, mustards, field pennycress, shepherd's purse, lambsquarter, pigweed, ragweeds > horseweed (marestail) > wild garlic	
Bromoxynil	Buctril, Moxy 1.5	2 pts	Emergence to boot stage	Mustards, wild buckwheat, lambsquarter, common ragweed, smartweeds > henbit, field pennycress, shepherd's purse, giant ragweed > pigweed	
Bromoxynil + MCPA	Bronate, Bison	1 to 2 pts	After 3-leaf stage but before wheat reaches boot stage	Same as bromoxynil and MCPA	
Bromoxynil + pyrasulfotole	Huskie	11 oz	After 1-leaf stage up to flag leaf emergence	Purple deadnettle, henbit, prickly and wild lettuce, horseweed (marestail), mustards, field pennycress, shepherdspurse, lambsquarter, pigweed and ragweeds > wild buckwheat, smartweeds > chickweed	
Carfentrazone	Aim	0.33 to 0.66 oz	Before jointing	Catchweed bedstraw, velvetleaf > pigweed > field pennycress, lambsquarter	
Clopyalid	Stinger	0.25 to 0.33 pts	After 2-leaf stage until boot stage	Horseweed (marestail), wild buckwheat, ragweeds, Canada thistle, dandelion > prickly and wild lettuce, smartweed	

Active Ingredient	*Trade Name(s)*	*Rate per Acre*	*Application Timing*	*Broadleaf Weeds Controlled*[1]	*Grasses Controlled*
Clopyralid + 2,4-D	Curtail	1 to 2.67 pts	Tillering to jointing	Prickly and wild lettuce, mustards, field pennycress, shepherd's purse, wild buckwheat, lambsquarter, pigweed, ragweeds, Canada thistle, dandelion > horseweed (marestail) swampweed	
Clopyralid + fluroxypyr Wild	WideMatch	1 to 1.33 pts	After 2-leaf stage until boot stage	Wild buckwheat, horseweed (marestail), ragweeds > prickly and wild lettuce, Canada thistle, dandelion	
Dicamba	Banvel	0.125 to 0.25 pt	Emergence to before jointing	Wild buckwheat, lambsquarter, pigweed, ragweeds, smartweed > prickly and wild lettuce, horseweed (marestail), shepherd's purse, dandelion	
Fluroxypyr	Starane	0.5 to 0.6 pt	From 2-leaf up to and including flag leaf emergence	Hemp dogbane, ragweeds	
MCPA	Chiptox, Rhomene, Rhonox	1 to 4 pts	Tillering to before jointing	Field pennycress, shepherd's purse, mustards, ragweeds, lambsquarter, pigweed, prickly lettuce > wild, buckwheat, horseweed (marestail)	
Mesosulfuron-methyl + safener	Osprey		After emergence or spring before jointing		Annual ryegrass > annual bluegrass
Pinoxaden	Axial	8.2 oz	2-leaf to preboot stage		Ryegrass, foxtails, and barnyardgrass
Prosulfuron	Peak	0.5 oz	Emergence to second node visible	Mustards, field pennycress, pigweed, common ragweed > prickly and wild lettuce, shepherd's purse, wild buckwheat, wild garlic, wild onion	
Thifensulfuron	Harmony GT	0.3 to 0.6 oz	After 2-leaf stage but before flag leaf becomes visible	Chickweed, purple deadnettle, henbit, prickly and wild lettuce, mustards, field pennycress, lambsquarter, pigweed > shepherd's purse, wild buckwheat, smartweed, Canada thistle, wild garlic and onion	
Thifensulfuron + tribenuron	Harmony Extra	0.3 to 0.6 oz	After 2-leaf stage but before flag leaf becomes visible	Wild garlic and onion, field pennycress, mustards, chickweed, henbit shepherd's purse > prickly and wild lettuce, horseweed (marestail), wild buckwheat	

Active Ingredient	Trade Name(s)	Rate per Acre	Application Timing	Broadleaf Weeds Controlled[1]	Grasses Controlled
Tribenuron	Express	1/6 to 1/3 oz	After 2-leaf stage but before flag leaf becomes visible	Chickweed, deadnettle, henbit, wild lettuce, mustards, field pennycress, lambsquarter	
[1]Control is ranked using greater than symbols; excellent > good.					

Plant Diseases

Be on the Lookout for Mosaics in Wheat - (*Kiersten Wise*)

It is time again for the annual call to look out for two soilborne virus diseases of wheat: Soilborne wheat mosaic virus and Wheat spindle streak (or yellow) mosaic virus. These diseases have very similar symptoms and can be difficult to tell apart. Additionally, both diseases may be present in a single field. These diseases each cause yellow-green streaks on leaves, and can stunt infected plants and cause dieback of leaf tips. Soilborne wheat mosaic virus can also cause a rosette symptom in susceptible varieties. This results in excessive production of severely stunted tillers. Plants infected with either virus may produce fewer stems and heads, and have reduced kernel number. Infection of highly susceptible varieties may result in plant death. Infected plants typically first appear in uneven patches of yellow or light green within a field, which can be confused with nitrogen deficiency or winter injury.

Figure 1. The yellow streaking on the wheat leaf is a common symptom of either mosaic virus disease (*Photo courtesy G. Shaner*)

Soilborne wheat mosaic and Wheat spindle streak mosaic virus infect wheat plants in the fall. Both viruses are transmitted to wheat roots by the soil-borne fungus *Polymyxa graminis*. This fungus does not cause damage to wheat by itself, but when cool, wet soil conditions are prevalent in fall, the fungus infects wheat roots and transmits the viruses to wheat plants. Symptoms of virus infection are not apparent until spring, and the severity of symptom expression depends on variety susceptibility and weather. Prolonged cool temperatures in spring (under 60°F) enhance symptom development of both diseases in infected fields.

No control methods are available to reduce symptoms in currently infected plants, and crop rotation may not prevent infection since the fungus that transmits the virus can survive in the soil for over 5 years. The best way to manage these diseases is to plant resistant varieties in areas with a previous history of the diseases. Varieties are available with good resistance to one or both of the mosaic virus diseases. Be sure to check the variety if you have problems with both soilborne virus diseases in a single field, since some varieties are resistant to only one virus.

Bits & Pieces

The Purdue Plant And Pest Diagnostic Lab: The 'Doctors' Are In – (*Tom Creswell, P&PDL Director and Gail Ruhl, Senior Plant Disease Diagnostician*)

The Purdue University Plant and Pest Diagnostic Laboratory (P&PDL) specializes in the identification of plant diseases, insects and plants as well as in the diagnosis of plant-health related problems. The Lab is a central facility for receiving both physical samples and digital images. We are a partner in the National Plant Diagnostic Network (NPDN), a national consortium of diagnostic laboratories that enhance agricultural security by rapidly detecting and monitoring pest and pathogens introduced into a new region of the United States.

We strive to provide accurate and rapid identification of:

-Fungal, bacterial and viral plant diseases
-Insects and other arthropods
-Insect damage
-Unknown plants, including terrestrial and aquatic weeds
-Vertebrate pests
-Environmental/cultural injury to plants

We serve as a source of unbiased information regarding pest management strategies and provide training for plant and pest related problems.

Our per sample handling fee for routine diagnosis is $11.00 for in-state samples and $22.00 for samples originating from out-of state.

For more information on fees and services, see our website: <http://www.ppdl.purdue.edu/services.html>

You may download forms, submit digital images for diagnosis and keep up to date on current plant problems and pests on our P&PDL website: <http://www.ppdl.purdue.edu>.

Plant and Pest Diagnostic Laboratory (P&PDL) is located at:

LSPS – Room 101, Purdue University
915 W. State St.
West Lafayette, IN 47907-2054
(765) 494-7071
FAX: (765) 494-3958

Top 10 Diagnostic Tips

1. Time is money: Don't wait until the problem is widespread to send a sample. Many disease and insect problems are manageable if caught early.

2. Dead plants tell no tales: Plants that are totally dead, dry or rotten are useless for diagnosis. Collect and submit declining but not completely dead plants.

3. **What's bugging you?** Collect several examples of insects for ID, just in case some get damaged in shipping or if both males and females are needed. Many can be shipped in vials with 70% alcohol. More details at: <http://www.ppdl.purdue.edu/PPDL/physical.html>.

4. More is better: The main concern may be overlooked if you send only one plant, one insect or a single branch. Send plenty of material or a whole plant if practical. Make sure samples are representative of what you are seeing. Digital images can help too!

5. Get to the root of the problem: Many plant problems are related to the roots and soil. Dig plants rather than pull them up to keep roots intact. Include plenty of the small roots and at least a cup of soil. (Complete soil nutrient analysis is available from commercial labs. For details see: <http//www.ppdl.purdue.edu/PPDL/pubs/MBP-3.pdf>)

6. A place for everything: If soil gets on the leaves during shipment it can mask symptoms or even create a "disease" that wasn't there at shipment. Keep soil around roots so they don't dry out. Bag the roots and soil and tie at the main stem. Wrap foliage in newspaper lightly then pull the bag over the rest of the plant and tie the top loosely to keep foliage from drying out. Make sure foliage isn't wet before packaging.

7. Include details: The more you tell the diagnostic lab about the situation the better. Please give complete information including name of plant, location, percent affected, symptoms of concern, distribution, soil type and drainage, and fertilizers or pesticides used recently. For Plant ID or Weed ID please give full details requested on submission form.

8. Fresher is better: Mail or deliver samples as soon as you can. Store samples in a cooler on hot days until you can deliver or ship them. Avoid mailing samples on Fridays since most plants will start to rot after being in transit over a weekend. A next day delivery service is needed for urgent samples or those that may rot quickly in shipment.

9. Fragile, handle with care: Padded mailing envelopes may be used for woody plants which are not fragile but crush proof boxes with crumpled newspaper for padding are preferred in most cases (essential for herbaceous plants and turf samples). Insect vials must be padded to prevent breakage in shipment.

10. 'Heads-up" for priority samples: When mailing high priority samples call to let us know the sample has been shipped so we will be on the 'look-out'! If you are personally dropping off a sample and wish to visit with a diagnostician or specialist it is best to call ahead and schedule an appointment time.

2009 Popcorn Agri-Chemical Handbook – (*Genny Bertalmio*)

The 2009 Popcorn Agri-Chemical Handbook is now available at <http://www.popcorn.org/handbook> to ensure everyone in the popcorn industry is informed about products registered for use on popcorn or in popcorn storage facilities. The handbook lists agri-chemicals registered, special use restrictions, the status of a chemical under special review by the Environmental Protection Agency (EPA) and residue tolerances established by EPA, CODEX and Japan.

The Popcorn Board urges you to provide the link to your growers or download, print and distribute the updated version of this critical information to them. Contact Genny Bertalmio, +1.312.673.4883 or <gbertalmio@smithbucklin.com>, for further information or if you require a hard copy.

The Popcorn Board accepts voluntary contributions to ensure continued funding of its efforts to provide this important information to the popcorn industry. Checks should be mailed to the Popcorn Board, 401 N. Michigan Avenue, Chicago, IL 60611.