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WHEAT

HERBICIDE CARRYOVER TO WHEAT
by W.W. Witt and J.R. Martin

Grain producers often express concern about herbicide carryover to cause injury to rotational crops during periods of dry weather. Parts of Kentucky have experienced below average rainfall this year, and as the wheat planting season approaches, wheat producers should consider if some fields have the potential for herbicide carryover problems.

The potential for herbicide carryover depends on the herbicide degradation rate, the amount of herbicide applied per acre, and the sensitivity of a rotational crop, such as wheat, to the herbicide applied to the previous crop. The duration of herbicide persistence is determined by the rate at which the herbicide degrades in the soil. This rate of degradation depends on the chemical structure of the herbicide, and soil characteristics such as pH, clay content and organic matter. Climatic conditions play a large role in regulating this rate of degradation. Maximum chemical and microbial degradation occurs in warm, moist soils. Extreme conditions, such as long periods without rain, slow the degrading process.

Herbicide carryover to cause rotational crop injury has not been a widespread problem in Kentucky during the past 25 years. Instances of carryover injury have occurred each year and will occur again this year. What is the likelihood of herbicide carryover problems in wheat this planting season? Unfortunately, there is not a simple answer to this question.

According to the rotational intervals on product labels, those herbicides with the greatest risk of carryover to wheat in Kentucky include those with the active ingredient atrazine (AAtrex), simazine (Princep), or clomazone (Command). The rotational intervals are based on risk of crop injury and residue tolerances for feed or food.

Injury is the issue in cases with atrazine and simazine, whereas, both crop injury and tolerances for feed and food uses of wheat are the issues dealing with clomazone. Historically, herbicide injury to wheat has occurred only in instances of where the total amount of atrazine and simazine exceeded 3 pounds active ingredient (ai). Rates of atrazine and simazine this high have not been used for many years. As the amount of atrazine and simazine has declined, so has the occurrence of wheat injury from these commonly used corn herbicides. However, this is not to say that carryover injury to wheat will not occur this year.

The following items should be considered in determining the potential for herbicide carryover injury to wheat.

Rainfall. The most important time of rainfall for herbicide degradation is the first month following

herbicide application. Fields receiving normal rainfall during this time will be much less likely to have herbicide carryover.

Soil pH. If the pH is above 7.0, the likelihood of atrazine and simazine carryover will increase greatly. Conversely, carryover of clomazone will increase when the soil pH is below 6.

Herbicide rate and timing. Fields in which atrazine, at less than 2 LB ai per acre, was applied in April and had normal, or near normal rainfall, will usually not persist to cause wheat injury. The later in the season that atrazine was applied, the greater the potential for wheat injury. Many atrazine-containing products recommend rotating to only corn or sorghum when applications are made after June 10. Remember that atrazine is an ingredient in many corn herbicides (see AGR-6, Chemical Control of Weeds in Kentucky Farm Crops).

Tillage. Any herbicide remaining in the soil will be distributed throughout the zone of tillage and this results in the herbicide concentration being diluted in this tilled zone. This dilution decreases the potential for herbicide injury but does not eliminate the injury potential.

Date of wheat planting. Fields suspected of herbicide carryover should be planted as late as possible.

Herbicides of concern. The following herbicides should be considered the most likely to cause carryover problems in wheat.

CORN HERBICIDES:
Atrazine (especially at 2 lb ai or more)- Products containing atrazine include:
AAtrex, Atrazine, Bicep II, Bicep II Magnum, Buctril / Atrazine, Extrazine II, FieldMaster, Fultime, Guardsman, Laddok, Leadoff, Marksman, Surpass 100

Princep (especially at 2 lb ai or more)

SOYBEAN HERBICIDES:
Command

More specific information on herbicide persistence and carryover can be found in the following University of Ky publications:

AGR-6, Chemical Control of Weeds in Kentucky Farm Crops
AGR-139, Herbicide Persistence and Carryover in Kentucky
AGR-140, Herbicides with Potential to Carryover and Injure Rotational Crops in Kentucky

VEGETABLES

SCLEROTIUM ROLFSII CAUSING ROT IN PUMPKINS
by William Nesmith

I have observed two cases of fruit rot in pumpkins caused by the soilborne fungus Sclerotium rolfsii. In each case, the level of diseased fruit was about 3-5%. I have not observed this disease before on cucurbits in Kentucky, but it is a common problem in southern regions of the US. Interestingly, in our plots at the Robinson Substation, we only found the disease in plots that had chlorothalonil included in the weekly sprays. However, this fruit rot was not found in plots where Quadris was being alternated with chlorothalonil.

This disease is easily diagnosed and should not be confused with other fruit rot diseases if attention is paid to details. Diseased fruit had an abundance of white mycelium clearly evident around the base of the fruit, and when the diseased fruit were pick up, the portion surrounded by this mycelium usually remained attached to the ground. Small mustard-seed-like fruiting bodies (white to brown) of the fungus were very evident in the mass of fungal growth. The presence of sclerotia will allow one to easily separate this fungus from Fusarium and Phytophthora, too other causes of fruit rot in pumpkins.

I will not comment on control strategies for S. rolfsii at this time. There is nothing one can do at this stage of the season, except for not harvesting rotted fruits.

CONTROLLING POST-HARVEST ROTS IN PUMPKINS
by William Nesmith, Terry Jones, and Brent Rowell

Rotting of pumpkins after harvest is a serious problem for growers, wholesalers, and retailers. Control of post harvest rotting involves preventative steps taken during the growing season, as well as during harvest, storage and handling. Rescue fungicide treatments are not available.

Several of the pathogens causing pumpkins to rot in

storage become established on or in the fruit during the production season. It is therefore essential to control diseases during the growing season - right up until harvest time - by using recommended seed treatments, crop rotations, and preventative fungicide sprays. This is especially true for anthracnose, gummy stem blight (black rot), Microdochium blight, and bacterial leaf spot. It is also important to control root, stem and foliage diseases during the growing season so that fruit develop and maintain the high sugar contents needed for making strong cell walls. Adequate fruit sugar content is important in the defense against pathogen attack and in maintaining long-term shelf life.

Many pathogens cannot invade and damage sound, undamaged pumpkins because the strong cell walls prevent invasion. Therefore, most pathogens that rot ripe pumpkin fruits enter through wounds or weakened areas in the rind. Some pathogens, however, do have the enzymes necessary to degrade rind tissues, but their entry is much easier when rind defenses are weak.

Harvesting and handling operations should be done with care to minimize cuts and bruises in the rind; these wounds leave open gaps in the pumpkins' primary defense against decay organisms. Be especially careful to protect the handles (stems), because damage here is easy and damaged or diseased handles can drastically reduce marketability of the fruit.

Rind health can be improved significantly by curing pumpkins after harvest for 7 to 10 days at temperatures of 80-85 degrees F with relative humidity of about 80-85%. After the curing steps, it is critically important that both temperature and humidity be lowered to those recommended for storage (50-55 degrees F and 50-70% relative humidity, to reduce the disease potential. If storage temperatures are too high, respiration of the fruit is higher which depletes stored food reserves that the fruit uses to maintain rind health. High humidity favors fungal growth. Cold temperatures (below 50 F) results in chill injury to the fruit, causing irreversible physiological damage and loss of rind defenses. Prolonged exposure to chilling temperatures or even short exposure to temperatures near freezing will result in permanent injury and lead to breakdown of the fruit followed by rot by a number of weak pathogens, especially from Alternaria, anthracnose, and Fusarium. Pumpkins should be harvested before they are exposed to chilling injury in the field and protected against chilling injury during storage.

Immature fruit are excellent targets for fungi, which greatly reduces shelf-life. Such fruit will serve to rapidly build up pathogen populations in the storage area. Never store immature fruit (if they are harvested), with mature fruit. It is important that pumpkins be well matured before harvest and storage.

Do not store pumpkins directly on soil. A layer of moisture absorbing material (straw or hay works well) is needed between the fruit and ground to prevent wet spots from serving as infection sites for a number of fungi. Good air circulation around the pumpkins is important to reduce surface moisture, especially when temperature changes are occurring. Check stored fruits regularly for signs and symptoms of rot and discard diseased fruit. This step eliminates the inoculum they contain and reduces spread to healthy pumpkins. The old analogy applies: "one rotting fruit spoils the whole lot".

Pumpkins keep best when not piled on top of each other. Piled pumpkins are much more prone to rot.

CABBAGE WEBWORM
by Ric Bessin

There is another southern pest that has made its way into eastern Kentucky. It is the cabbage webworm. This insect is common along gulf coast and southern Atlantic coast states but only rarely moves into our state. This pest attacks cabbage, broccoli, cauliflower and other crucifers. Producers should monitor for this insect along with imported cabbageworm, diamondback moth, cross-stripped cabbageworm and cabbage looper.

This insect is easily recognized. The larvae are tan colored with four brown stripes running the length of the body. The larvae are often found inside webbed pocket formed along the leaf margins. Initially damage appears as small (quarter-sized) brown, dried areas along the leaf margins.

Unfortunately, this pest is more destructive than the other lepidopterous pests of cabbage, particular on small plants. The other caterpillar pests are generally leaf feeders, although some do prefer the young leaves near the bud. Many of the cabbage webworm larvae will feed on the leaf margins by webbing the leaf margin back on itself to form a pocket in which it feeds. Some of the cabbage webworm are more destructive and will bore into the bud of the plant. This can kill the bud and cause lateral budding.

Controls used for other cabbage pests are effective against cabbage webworm when timed properly. Sprays should be applied while the larvae are small before they construct their protective silken webs.

SHADE TREES & ORNAMENTALS

OAK BACTERIAL LEAF SCORCH AFFECTED BY DROUGHT

by John Hartman

This summer has been one of extreme drought and most of the trees in central Kentucky, as well as those in other regions statewide, are showing stress related to the dry weather. In many urban neighborhoods where pin oaks have predominated, the simultaneous occurrence of bacterial leaf scorch (*Xylella fastidiosa*) and drought shows diseased pin oaks at their worst.

Symptoms of bacterial leaf scorch, this chronic and eventually fatal disease, are most noticeable in the fall, and the disease is often overlooked at other times of the year when disease symptoms are not readily noticed. In fall, leaves of healthy trees are still green. They stand in obvious contrast to the browning and falling foliage of diseased trees. Some recently infected trees have some limbs with green foliage and others with brown foliage. Infected trees are gradually debilitated, however, as over the years, twigs, branches, and limbs begin to die. Many of our urban pin oaks are showing branch dieback typical of trees that have been infected for 5 or more years. Unfortunately for these trees, the disease is made worse by the drought, so they look worse than usual this year. Bacterial leaf scorch disease does not spread rapidly - indeed some of the pin oaks in many neighborhoods appear to be uninfected, as yet. There is no cure for bacterial leaf scorch, so one should expect diseased trees to be gradually lost over the years. In the meantime, newly infected trees can be made to look somewhat presentable for a few more years if the dead wood is pruned out.

The best remedy for bacterial leaf scorch is tree replacement. To maintain species diversity, avoid planting all the same species in each neighborhood. Choose trees that do well in Kentucky such as those listed in the three U.K. Cooperative Extension Service publications *Small Trees for Urban Spaces in Kentucky*, *Medium-Sized Trees for Kentucky Landscapes*, and *Large Trees, the Giants of Kentucky's Landscape*, which are available at County Extension Offices. When replanting, it is not necessary to use large transplants. Often, smaller nursery stock becomes established more quickly than larger nursery stock so that ten years later, their relative sizes might not be much different. In all cases, during the several years following tree planting, make provisions for watering the trees regularly, apply mulch periodically, and pruning trees correctly so that good, strong, branch structure is established when the trees are young. During dry seasons such as this one, all trees, not just the newly planted ones, will need regular watering.

PESTICIDE NEWS & VIEWS

SPINOSAD RECEIVES ADDITIONAL REGISTRATIONS

by Ric Bessin

The EPA granted DowAgrosciences additional crop registrations for their spinosad insecticides. These new crop registrations include dry and succulent beans, cucurbits, field and popcorn, stone fruits, soybeans, sorghum, wheat. Spinosad is sold as Spintor for fruits and vegetables and as Tracer for field crops. Spinosad is effective against lepidopterous larvae, some thrips and Colorado potato beetles.

ORNAMENTAL & TURF - ASIAN LONGHORNED BEETLE UPDATE

The Asian longhorned beetle, which has infested parts of New York and Illinois, is the target of a USDA project to develop a pheromone based attractant. Researchers have isolated chemicals produced by male beetles that when synthesized appear to attract both sexes. If successful, bait traps would be used to find new infestations and to detect beetles at ports of entry. Tests are currently being conducted in China. For more information contact USDA botanist Peter Bretting: (301)504-5541; pkb@ars.usda.gov NMPRO via W. Dunwell, Horticulture, UK, 8-99.

WORKER PROTECTION STANDARD ENFORCEMENT

As we near the 5 year anniversary of full implementation of the Worker Protection Standard (WPS), the EPA has initiated performance measures to assess State WPS program implementation and enforcement. As a result, EPA personnel will be visiting the Kentucky Division of Pesticides to evaluate the WPS compliance program. The County Cooperative Extension Service Offices played a major role in educating growers about the WPS and encouraging compliance with it. Consequently, now would be a good time to reemphasize the WPS and remind employers of workers and pesticide handlers that the WPS and pesticide safety are wise practices when it comes to working with pesticides and pesticide-treated crops.

NEW WEBSITE ON PESTICIDE SAFETY PROGRAMS

The EPA has created a new website that provides information on pesticide safety programs. The address is: http://www.epa.gov/pesticides/safety . The website, which can be accessed in English and Spanish, provides specific information on applicator certification and training requirements and EPA's Worker Protection Standard, including pesticide safety training, notification of pesticide applications, use of personal protective equipment and emergency medical assistance. The site also provides information on the Pesticides and National Strategies for Health Care Providers, and EPA-led initiative aimed at helping health care providers become trained in diagnosing and preventing pesticide related illnesses. OPMP, USDA, 8-99.

OTHER INFORMATIVE WEBSITES
http://www.epa.gov/pesticides/announcements8299.htm
Contents: EPA press release on actions against agricultural uses of methyl parathion and azinphos methyl, summary of methyl parathion risk assessment, fact sheets on the methyl parathion and azinphos methyl cancellation agreements and risk management decisions and other information including the EPA schedule for review of organophosphate pesticides.

http://www.usda.gov/nass/
Most recent use data published by the National Agricultural Statistics Service (NASS) regarding crop treatments with azinphos methyl and methyl parathion. These include Agricultural Chemical Usage - 1997 Fruits Summary (7-98), Agricultural Chemical Usage - 1998 Vegetable Summary (7-99), Agricultural Chemical Usage - 1998 Field Crops Summary (5-99). OPMP Monthly Newsletter, 8-99.

DIAGNOSTIC LAB - HIGHLIGHTS
by Julie Beale

Samples sent to the Diagnostic Labs over the past two weeks have included soybean with soybean mosaic virus and tobacco with black shank.

Fruit samples included strawberry with Phomopsis leaf blight; peach with scab; and apple with bitter rot. On vegetables we have seen Microdochium blight, Fusarium fruit rot, powdery mildew, watermelon mosaic virus 2, cucumber mosaic virus and zucchini yellow mosaic virus on pumpkin; and angular leaf spot on bean.

From the landscape, we have seen Dutch elm disease; anthracnose on walnut; bacterial scorch on oak; white pine root decline; and black root rot on holly.