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TOBACCO

CURRENT BLUE MOLD STATUS
By William Nesmith

Blue mold continues to spread in the southeast. Activity has been confirmed in transplant production systems in four counties in southern Georgia: Colquitt, Echols, Grady, and Lowndes; and, in Columbia County in northern Florida. In at least one case infected transplants probably have already been moved to the field. It remains our understanding that the above-mentioned outbreaks do not directly involve transplants destined for the north. However, forecasts provide from the North American Blue Mold Forecast Center have indicated airborne spread of spores may have occurred over the southeast and as far north as eastern South Carolina and southeastern North Carolina.

These outbreaks should be serving as a reminder to Kentucky's tobacco growers NOT to bring in southern-grown transplants! Using southern-produced transplants increases the risk of introducing blue mold into Kentucky earlier than it is likely to arrive by natural means. Instead, we urge growers to use plants that are locally grown from seed to finish in well-managed operations under regular fungicide spray programs. If out-of-state plants must be used, consider using plants that are grown (from seed until you receive them) from northern states that are outside the tobacco producing region.

Growers are urged to learn how their particular lot of transplants is actually being produced. Be very watchful of situations where a commercial transplant supplier is involved with both locally grown and out-of-state sources, because cross-contamination can occur. It may take some direct questioning of the supplier to learn the details of the operation, however. Here are some examples of problems we have observed in the past that lead directly to the spreading of blue mold via southern transplants infected/infested with the fungus when the grower understood or assumed they were obtaining locally produced transplants.

* Local supplier was producing many plants on-site, but also had southern transplants shipped to this same site for pickup, further distribution, or grow-out.

* Plants are marketed as locally-grown, but had been started out-of-state then "finished" or "plugged" in KY.

* Orders were written initially (in good faith) for locally-grown plants, but due to production shortages were filled (at the time of pickup) with out-of-state plants.

All Kentucky transplant producers and growers should be spraying seedlings preventively with Dithane DF or Ferbam. These fungicides have NO ability to eradicate the fungus after infection has occurred, so please do not

wait until blue mold is active to start sprays. Instead, make spray applications on a 5- to 7-day schedule starting when plants are dime-size and continuing until transplanting to the field. Smaller plants can be sprayed with the low rates of Ferbam but Dithane will damage plants smaller than dime-size. In addition, manage heating and ventilation systems to keep the plants dry to reduce infection and spread.

Acrobat MZ will not be labeled for transplant use this year, but it is anticipated that it will soon receive a label for field use in Kentucky.

INSECT CONTROL OPTIONS IN NO-TILL TOBACCO
by Lee Townsend

The most effective approach to soil insect control, a preplant incorporated insecticide treatment about three weeks before planting, is not an option in no-till tobacco production. A transplant water treatment is the only way to provide protection in this situation. It creates a small "pocket" of insecticide-treated soil near the base of each plant. The insecticide may act to repel soil insects moving to the plant or may actually kill them. Given the limited area that is treated, it is reasonable to expect only a moderate degree of control against insects such as hard-bodied wireworms, while soft-bodied cutworms are probably more susceptible. Fortunately, wireworm problems are rare, especially in fescue sods. Products available for use in the transplant water include Admire, Orthene, and Transplant Water Solution (lindane).

Admire is labeled for suppression of wireworms at 1.4 to 2.8 fl oz per acre. In situations where low wireworm pressure is expected, the lower end of the range (1.4 fl oz) is the most economical alternative. This is true if the grower is planning to use Admire for preventive aphid control. The additional cost of the slightly increased rate will be relatively low. The transplant water application of this product probably would be more effective against wireworms than the float drench because the treated area would be larger than just the root ball. This approach will provide early flea beetle control.

A transplant water application of Orthene (1 pound per acre) is labeled for cutworms and has provided very good protection of transplants from these insects in artificial infestation trails at UK. There is no Kentucky data evaluating this product, or any of the others, against wireworms. This Orthene application will provide very good tobacco flea beetle control for the first three to four weeks after transplant.

Transplant Water Solution (lindane) is labeled for wireworm control. It has not been effective against cutworms in UK trials and does not control flea beetle feeding on new transplants.

Either Admire or Orthene is a good choice as transplant water treatments in no-till tobacco. They protect new transplants from flea beetle injury, a threat in all tobacco fields. Unless there is a history of chronic wireworm injury in a field, it is unlikely that a problem will appear. In fields with a known wireworm problem, conventional field preparation and application of a broadcast soil insecticide application is the only effective way to deal with the problem.

Slugs are a potential problem in no-till tobacco, and one for which there are no good control alternatives. A thick mulch of killed grass will keep the soil cool and relatively moist, and provides an excellent protective cover for these slimy creatures. If slugs are present, they may turn to tobacco transplants as the only food source in the field.

Slugs tend to have a clumped distribution in fields so the damage is often limited to "hot spots". Slug baits can provide good control but are too expensive to apply to large areas on a preventive basis. Regular field checks after the crop is set will allow early detection of slugs. A slug bait can be applied and severely damaged plants can be replaced.

FLOAT PLANT INSECT PESTS
by Lee Townsend

Very wet media and algae are major factors that contribute to gnat problems, fungus gnats and shore flies, in greenhouses and float systems. Adults are the noticeable stage and are mainly an annoyance. The larval stages of the shore fly can damage small plants in the cells, producing holes in the leaves that resemble the feeding of slugs and small cutworms.

The presence of these insects is usually overlooked until there is a massive swarm of adults sitting on the plant leaves. Orthene sprays will eventually thin them out. It is difficult to control the larval stages because they are down in the algae or under the protective cover of the leaves. Preventive control is based on reduction of algal growth and keeping media from getting too wet.

Occasionally, fungus gnat larvae can be serious pests in greenhouses. Most are scavengers, feeding on decaying organic matter in the growing media. However, some species will feed on root hairs, enter the roots, or even attack the crown or stem of the plant. Infested plants

generally lack vigor and may begin to wilt. Adults (gnats) can be seen running on the foliage before injury caused by the larvae becomes apparent.

Fungus gnats are small (1/8") black flies with comparatively long legs and antennae, tiny heads, and one pair of clear wings. Females lay tiny ribbons of tiny yellowish white eggs in the growing media that hatch within 4 days. The clear larvae are legless and have black heads. Larvae feed for about 14 days and pupate near the surface of the medium. Adults live only about a week. Under greenhouse conditions, about 20-25 days are required to complete a generation.

Shore flies also are small gnats but have short antennae, red eyes, and heavier, darker bodies. A pair of smoky wings with several clear spots can be seen when looking closely at the insect. They are good fliers and can be seen resting on most any surface in the greenhouse. They resemble winged aphids but aphids have two pairs of wings and the distinctive, tube-like cornicles on the abdomen, and do not move as quickly.

The life cycle is similar to that of the fungus gnat. The yellow to brown larvae, which may be up to 1/4" long, differ in having no apparent head. Both larvae and adults feed mostly on algae growing on media, floors, benches, or pots. Some have been seen boring directly into the base of small plants. Damaged plants will easily break off at the soil surface. The adults may spread soil pathogens inside the greenhouse.

WHEAT

ARMYWORM FLIGHT HAS BEGUN
By Doug Johnson

Pheromone baited traps have captured armyworm moths for the past two weeks in Princeton. This is a clear indication that armyworm season has begun. NO, the worms are not yet in your fields, but they may be there soon. The season generally runs from April (depending upon the weather) through harvest with the most important time being during the flag leaf through head filling time period.

The tan moth has a 3/4" wing span. There is a small but prominent white spot in the middle of each front wing. Moths emerge in April and May and will feed and mate for 7 to 10 days before beginning to lay eggs.

Eggs hatch into small brown worms with stripes down the back. The head is brown with dark brown 'honeycomb' markings. They generally feed by chewing on the foliage of the wheat plants.

Armyworms do not like bright light so they will be found on the ground during the sunny part of the day. Only under low light conditions will you find them up on the plants.

Armyworms have potential to hurt the wheat crop badly. However, they rarely do so because they are heavily preyed up by a large number of natural enemies. The most likely location for problems are fields with lodged grain due to over use of nitrogen or seeding too heavily and fields that have been sprayed with an insecticide. Armyworms survive well under lodge wheat and insecticide applications remove their natural enemies. Check these locations first.

You can view color pictures, pest calendar and scouting information of armyworm on the IPM web page at: http://www.uky.edu/Agriculture/IPM/scoutinfo/scout.htm

You may view a copy of Entfact-111, Armyworms in Small grains at: http://www.uky.edu/Agriculture/Entomology/entfacts/effldcrp.htm If you select the icon 'Complete list of Fact sheets' you can down load a 'PDF' format copy of the publication.

If you would like to monitor armyworm moth flight (or many other insect pests for that matter) you may obtain information on how to do so in ENTFACT-112 *Using Pheromone Traps in Field Crops*, and ENTFACT-54 *Vendors of Microbial and botanical Insecticides and Insect Monitoring Devices*. These publications may also be view at the above mentioned ENTFACT web site.

TILT AND QUADRIS RECEIVE SUPPLEMENTAL LABELS
By Don Hershman

During the past two weeks, there have been some significant developments in the area of wheat foliar fungicides. Specifically, Novartis was granted a supplemental, special local need (section 24C) label for Tilt, and Zeneca was granted a supplemental label for the foliar fungicide Quadris.

The supplemental label for Tilt allows producers to apply that fungicide to wheat through Feeke's growth stage 10.5 (full head emergence). You may recall that this use of Tilt was also approved last season, based on the fact that disease control in wheat in Kentucky is usually optimized when foliar fungicide applications are made during crop head emergence. The federal label does not allow Tilt to be applied later than crop flag leaf emergence (Feeke's growth stage 8). Last year, many

wheat producers took advantage of the delayed application of Tilt and were very pleased with the disease control and yield results they achieved.

The Quadris supplemental label was for the addition of numerous crops to the existing label, including wheat, plus some post application re-entry and resistance management guidlines. Like Tilt, the wheat label for Quadis allows application through Feeke's growth stage 10.5.

So, for the first time since I have been in Kentucky, wheat producers have two broad spectrum, highly effective products that can legally be applied when they are needed. Tilt and Quadris are both excellent products, but there are some minor functional differences between them. The table below summarizes these differences.

	TILT	QUADRIS*
Powdery mildew	Good	Fair / good*
Septoria tritici leaf blotch	Excellent	Excellent
Stagonospora nodorum leaf blotch	Excellent	Excellent
Tan Spot	Very Good	good / very good*
Glume Spot	Excellent	Excellent
Leaf Rust	Very Good	Excellent

*Effectiveness at highest labeled Quadris use rate of 10.8 fl.oz. / A.; other diseases are adequately controlled using the 6.2 fl. oz. / A rate.

The most significant difference between Tilt and Quadris is price. The information I have indicates that Quadris will cost producers anywhere from $3.84 to $14.63 dollars per acre more than Tilt, depending upon the use rate for Quadris. As indicated above, certain diseases will require the highest labeled use rate to achieve maximum disease control. The suggested retail price for Quadris is $300 / gal ($2.34 / fl. oz.) and the suggested use rates vary from 6.2 fl. oz. product per acre to 10.8 fl. oz. / A. In other words, an application of Quadris will cost between $14.50 - $25.27 / A. just for chemical. Costs for application and the recommended addition of 1% v / v crop oil when spraying Quadris are extra. A gallon of Tilt costs $341 ($2.66 / fl. oz.), but the use rate is 4.0 fl. oz / A.Because of depressed wheat prices, few producers will opt for the automatic use of foliar fungicides in wheat this spring. This is the way it should be since crop yield potential, crop price, cost of fungicide and application, disease incidence and severity, and crop stage should all be taken into consideration when deciding if and when to spray a fungicide in wheat. However, the economic side of the equation may have additional weight this year. A word of caution: don't automatically discount the use of wheat foliar fungicides in wheat this season because of the economic crisis. Although foliar fungicides are a significant crop input, the cost of material(s) and application will be more than offset if certain disease conditions develop which threaten crop yield and test weight. Of course, this is only true for the fungal diseases, listed above, which are impacted by the use of foliar fungicides.

For more information on making foliar fungicide use decisions for wheat, consult the University of Kentucky, Cooperative Extension Service publication ID -125, *A Comprehensive Guide to Wheat Management in Kentucky*.

GREENHOUSE

BEDDING PLANTS - A FEW DEADLY DISEASES
By John Hartman

Annual plants to be sold for spring sale and placement in the landscape are grown in many Kentucky greenhouses. In recent years, three diseases have been shown to be very devastating. They represent examples of diseases caused by fungi (black root rot), bacteria (geranium bacterial blight) and viruses (impatiens necrotic spot virus). This week, two of the three were found in specimens submitted to the plant disease diagnostic laboratory.

Black Root Rot. Pansy plants propagated from plug transplants into cell-packs were stunted and not growing well. Roots were dark and had black lesions or tips. Microscopic examination of the roots revealed high levels of the black root rot fungus, *Thielaviopsis basicola* (*Chalara elegans*). The pathogen was concentrated in the root system of the original plug and not in the roots that had grown out after the plug was transplanted, suggesting that the plugs were already diseased before transplanting. Although they probably will not die, infected plants would be expected to continue to grow poorly, especially after they were transplanted into the landscape. Furthermore, the grower will need to be careful that other plants, soil, pots, and tools in the greenhouse do not become contaminated because this fungus has a wide host range. Thus, the grower has little choice but to carefully destroy the plants.

Managing black root rot. Black root rot control mostly

involves prevention.

- Buy propagative plugs from reliable sources.
- Use clean potting soil, pots, and tools.
- Water plants so as not to splash soil from one plant to another.
- Avoid contaminating equipment and soil used for growing greenhouse plants.
- Control insects such as fungus gnats which can spread the pathogen.
- A fungicide such as thiophanate-methyl will suppress the disease, but it doesn't kill the fungus, so when the plants are set in the landscape, they will begin to decline.

Geranium Bacterial Blight. Geranium leaves with brown streaks along the veins were examined for evidence of bacteria. Large numbers of bacterial cells of the causal agent *Xanthomonas campestris* pv. *pelargonii* were found via microscopic examination. This disease also causes leaf spotting, leaf and whole plant wilt, and decay of the stem pith, vascular system, and cortex. It can be spread easily from infected to healthy plants via splashing water.

Managing bacterial blight. To control bacterial blight of geraniums, use cultural practices that prevent the disease.

- Promptly remove and destroy diseased plants.
- Keep production areas clean. Pathogens also may survive in potting media and soil and can be moved by shoes, shovels and hands.
- Use good growing practices such as proper fertilization, good plant spacing, and proper watering practices that will minimize wet foliage.
- Purchase cuttings from propagators using culture-indexing programs to lessen the chance of bacterial blight from getting into the crop.
- Do not place culture indexed geraniums near non-culture indexed plants or near holdovers from a previous crop.
- Grow geraniums from different suppliers in separate greenhouses; do not hang ivy geraniums, which are also susceptible to bacterial blight, above geranium crops.

What is a culture-indexed cutting? Bacterial blight can be transported into a geranium crop by an infested cutting. The cutting may appear normal and healthy, but it still contains tiny amounts of bacteria that later grow and cause disease in the contaminated plants and spread throughout the crop. Growers reduce the likelihood of getting infested cutting material by purchasing "cultured" or "culture-indexed" cuttings. These cultured cuttings are the end result of a complex and meticulous program to develop and produce pathogen-free geraniums.

Long before a culture indexed cultivar comes on the market, a heat-treated or meristem-derived disease-free plant is selected. Cuttings taken from this plant are taken to the laboratory where parts of the cutting are dissected and cultured for bacteria and other pathogens. The top part of the cutting is carefully rooted and potted in an isolation greenhouse. If all tests are negative, the cutting is grown on to form a nucleus of plants that will yield more cuttings. These, too, are run through the culture-indexing procedure to check for pathogens missed in the first assay. Sometimes, just to be sure, a third round of culture-indexing is done.

Cuttings that survive all the testing for pathogens become "mother" plants that are used to increase the number of plants of the disease-free cultivar. From these cuttings, large groups of production plants are produced. Growers who purchase culture-indexed material get plants from these production blocks. Cuttings from the production blocks are now four generations away from the original culture-indexed plants. If stringent precautions have been taken through these four generations, the cuttings should still be disease-free.

However, production blocks are located in a different greenhouse - possibly even in a different country from the original nucleus material. This is especially true in a global economy where high production costs can be reduced with low-cost labor. Although the material may have been pathogen-free to begin with, it could become infested somewhere in the production process. Growers will have best success with purchasing culture-indexed cuttings from the company that manages the original steps in the program (or a licensed propagator). These companies have their reputations to uphold and take care not to allow their stock to become contaminated.

Kentucky bedding plant producers also have their reputations to uphold and will want to invest in the culture-indexed plants so that their customers have the best quality geraniums possible. Be aware that when these plants are being sold, these more expensive plants are often displayed at the outdoor retail garden centers side-by-side with less expensive and possibly diseased plants. Where possible, growers need to observe how their geraniums are being marketed so that disease-free plants are not becoming contaminated.

SAFE PESTICIDE APPLICATIONS IN GREENHOUSES

By Lee Townsend and Ric Bessin

Pesticides are important tools for managing greenhouse pests. However, there is a great risk of worker exposure to pesticides by contact or inhalation in enclosed areas. The EPA has established Worker Protection Standards (WPS) for agricultural pesticide usage to minimize this risk. Growers using greenhouses need to be made aware of WPS requirements.

What is an REI? Restricted Entry Intervals are periods of time following a pesticide application when workers must not enter the treated area. For example, the REI for Orthene 75S is 24 hours.

When is posting necessary? You must post treated areas in greenhouses where restricted entry intervals (REI) are in effect unless no workers will be in the greenhouse during an application or while a restricted entry interval is in effect or the only workers that will be in the greenhouse are those who made the application and are aware of the information required to be given by the oral warning. If postings are necessary, they must be placed where they can be seen from all points where workers enter the treated area.

If workers will have no contact with anything that has been treated with the pesticide, then they may enter when the application is finished and any applicable ventilation requirements have been met.

What is a pesticide-treated area in a greenhouse?
1) When using a typical pump-up sprayer, the treated area is defined as where the pesticide was applied.
2) A 25-foot buffer must be a +ded in all directions if: the treatment is applied from more than 12" above the planting media, OR as a fine mist, OR using a spray pressure greater than 40 psi.
3) The entire enclosed area is included if the pesticide is applied as a smoke, mist, fog, or aerosol.
4) The entire greenhouse and any adjacent structure that cannot be sealed off from the treated area is included if a fumigant is used, OR
5) if the pesticide labeling requires the applicator to wear a respirator.

In cases 1) and 2) (above) workers can enter the area when the application is complete. For cases 3) - 5), specific ventilation requirements must be met, first. See the product label for more information.

LAWN AND TURF

CRABGRASS CONTROL AND TIMING OF HERBICIDES IN TURF
by A. J. Powell, Jr. and J. D. Green

To best control crabgrass in home lawns, apply a preemergence herbicide prior to any germination. It is better to apply the product weeks before expected germination than take a chance on early germination. Our target date for preemergence application is prior to April 1 in southern / western KY and April 15 in central / northern KY. Normally, however, significant germination will not occur until May and some years early June. Most data indicates that crabgrass begins germination when the soil temperature at the 4 inch depth reaches about 55° F. Since cold soil temperature greatly reduces microbial breakdown of the preemergence herbicide, applications made during the late winter or early spring are almost as effective as an April application.

Even if the target date passes and a few crabgrass plants are evident, it is still important to make the application in order to control germination during the peak germination period. In Kentucky, the peak period for crabgrass germination is normally in late May or early June. This is one of the reasons that split applications are usually more effective.

Dimension (dithiopyr) is a preemergence product that also has early post activity. However it is only effective at its highest use rate, when used in its liquid formulation, and only when the crabgrass is in the one to three leaf stage of growth.

Timing preemergence applications during forsythia bloom is often suggested. It is an indicator of temperature, albeit a poor one. With our extremely variable weather, some forsythia has bloomed three times in the past few months.

The use of Growing Degree Days to predict crabgrass germination has been tested but it also has great limitations for home lawns. Do you measure the temperature: 1) at the surface where most crabgrass germinates or at the 4 inch depth? 2) on a bare surface or under a dense sod? 3) on a north facing or south facing slope? 3) on a heavy soil or a sandy soil? All of these variables may occur in an individual lawn and the temperatures will vary greatly. Growing degree days work much better in areas where the air temperature warms up gradually and the soils are uniform, unlike Kentucky's home lawn environment.
The major homeowner products available are: 1) benefin + trifluralin (Team), 2) pendimethalin (Pre-M, Halts), 3) dithiopyr (Dimension), and 4) prodiamine (Barricade).

All are equally good if applied at their proper rate of active ingredient. The granular products are somewhat more effective than liquid applied formulations. However it is sometimes difficult to find granular products without nitrogen fertilizer. Most products are therefore dual purpose---control crabgrass and fertilize the turf. Because the nitrogen often causes excessive top growth (mowing), increases some disease problems, reduces root growth, increases summer weeds, etc. it is best to utilize those products without the fertilizer.

The greatest problem with these products however is that the high use rate listed on the bag is usually only about half that required to get all-season crabgrass control. Last year, the weather became very hot in August, the turf thinned, and crabgrass exploded. Even with an early application of a preemergence product used at the correct label rate, crabgrass still dominated most lawns. To prevent this, especially where crabgrass pressure is heavy, a second application should be made in late May or early June.

Escaped crabgrass can be suppressed in June with a post emergence crabgrass herbicide such as MSMA (or DSMA). To reduce the potential for serious turf burn when using MSMA, be careful to use the label rate, do not apply if daytime temperature is expected to reach 90 F or higher, and good soil moisture must be present. To get crabgrass control, a second application must be made 7 to 10 days later. Acclaim Extra is a newer and safer product, but it is not normally available on the homeowner market.

DATA ON SELECTED CHEMICALS AND ANTHRACNOSE OF CREEPING BENTGRASS

By Paul Vincelli

Anthracnose is commonly recognized as a serious disease of *Poa annua*. Golf course superintendents are also growing to appreciate the significance of this disease on creeping bentgrass, the predominant grass used on putting greens in Kentucky. One of the areas

of ongoing research at the UK Turf Center is screening of fungicides and biocontrol products for their efficacy in controlling both the foliar blighting and basal stem rot phases of anthracnose on creeping bentgrass. A summary of cultural and chemical recommendations for controlling this disease is provided in the Extension publication PPA-1, Chemical Control of Turfgrass Diseases, available through county Extension offices.

On creeping bentgrass, anthracnose is rightfully regarded as a stress-related disease. A variety of stresses can predispose the turf to infection, with heat stress commonly being one of the factors involved. In recent years, questions have arisen as to whether certain non-fungicidal products enhance anthracnose pressure on putting greens. Thus, last year we tested certain products about which questions were raised.

The test was conducted at the UK Turf Center as part of our ongoing testing program, on 'Penncross' creeping bentgrass maintained at 5/32", irrigated as necessary, and fertilized with 1.5 lb N/1000 sq. ft. in Oct and in Dec. Treatments were applied using a CO_2 sprayer delivering 2.5 gal/1000 sq. ft. to plots measuring 16 sq. ft. plots arranged in a randomized complete block design. Details of the test can be obtained in the upcoming volume (Volume 54) of *Fungicide and Nematicide Tests*.

In the accompanying table, we can see clear evidence that an application of Dimension 1EC herbicide according to label directions did significantly increase anthracnose pressure as compared to control plots receiving only water. This enhancement in anthracnose also resulted in a significant deterioration of turfgrass density. Although these data represent only one year of testing, this provides evidence in support of another rumored--but to my knowledge, unpublished--report of enhanced anthracnose pressure from Dimension herbicide. It is important to note that absolutely no enhancement of anthracnose nor deterioration of turfgrass density was found when the spray program included regular, preventive fungicide applications for anthracnose. This is evident when one compares the plots treated with Daconil Ultrex + Dimension to those treated with Daconil Ultrex alone.

In this test, no statistically significant effect was noted in severity of anthracnose nor in turfgrass quality where Primo Liquid 1EC growth regulator was used according to label directions.

Bottom line: Dimension 1EC herbicide may increase anthracnose pressure on creeping bentgrass. However, our data to date suggest that a preventive spray program for anthracnose control can help keep this potential enhancement of disease from being realized.

No enhancement of anthracnose was noted from Primo Liquid 1EC in the one year of testing.

Treatment and amt / 1000 sq ft	Dates of application	Percent of plot with anthracnose* - 31 Jul	Color** - 29 Jul	Density** - 29 Jul
Water	5/25 6/10 6/24 7/8 7/22	67 ef	5.3f	5.3fg
Aliette Signature 80WG 4.0 oz. + Chipco 26GT 2SC 4.0	5/25 6/10 6/24 7/8 7/22 5/25 6/10 6/24 7/8 7/22	0 a	9.0 a	9.0 a
Daconil Ultrex 82.5WDG 3.8 oz	5/27 6/10 6/24 7/8 7/22	0 a	8.3 a-c	7.6 b-d
Primo Liquid 1EC 0.125 fl oz.	5/27 6/24 7/22	89 fg	5.0 fg	5.0 g
Daconil Ultrex 82.5WDG 3.8 oz. + Primo Liquid 1 EC 0.125 fl oz.	5/27 6/10 6/24 7/8 7/22 5/27 6/24 7/22	4 fg	8.6 ab	8.3 ab
Dimension 1EC 1.5 fl oz	5/27	99 g	4.0 g	3.6 h
Daconil Ultrex 82.5WDG 3.8 oz + Dimension 1EC 1.5 fl oz	5/27 6/10 6/24 7/8 7/22 5/27	1 a	8.3 a-c	7.6 b-d

*Means followed by the same letter are not significantly different at P=0.05 by Waller-Duncan *k*-ratio *t*-test, *k*=100, *P*=0.05.
**Turf quality parameters assessed on a 1-9 scale, where 9 = excellent.

HOUSEHOLD

TERMITE BAITS: AN UPDATE
by Mike Potter

A growing number of pest control firms are now using termite baits as an alternative form of treatment. As more companies offer this option, homeowners will be calling for information and advice as to which approach— bait or conventional 'barrier' treatment— is most effective. Additional questions will be raised about the new "do-it-yourself" termite bait being sold through retail outlets. This column provides the latest information about termite baits to pass on to your customers.

For years, the standard method of controlling subterranean termites was to apply a liquid pesticide (termiticide) to the soil. The goal was to block all potential routes of termite entry into the structure. Termites attempting to penetrate the treated soil were either killed or repelled. While the majority of liquid barrier treatments are successful, at times they have failed to provide adequate protection.

There are, in fact, many obstacles to achieving a continuous termiticide barrier around and beneath a building. It is hard to uniformly wet soil, and many potential termite entry points are hidden behind walls, floor coverings, and other obstructions. Termites can tunnel through small untreated gaps as narrow as pencil lead, so it is understandable that conventional liquid treatments sometimes fail to correct a termite problem.

The Bait Concept - Termite baiting is an entirely different concept. With this approach, tiny amounts of insecticide are deployed like edible "smart missiles" to knock out populations of termites foraging in and around the structure. Foraging termites consume the bait and share it with their nest mates, resulting in a gradual decline in termite numbers. Some baits may even eradicate entire termite colonies. A comprehensive baiting program then seeks to maintain a termite-free condition on the customer's property through ongoing monitoring and rebaiting as needed.

The baits consist of paper, cardboard, or other "termite-friendly" food, combined with a slow-acting ingredient lethal to termites. The bait-toxicant combo must be slow acting in order to maximize distribution among the termite population, which may contain hundreds of thousands of individuals. Some bait stations are installed below ground out in the yard, while others are placed within the structure in the vicinity of active termite mud tubes. Because paper and cardboard decompose rather rapidly in soil, most below-ground installations initially utilize untreated wood stakes or monitors. Once termites are detected in the monitors, the toxicant-laced paper or cardboard baits are added.

On some properties, termite baits may constitute the only form of treatment. In other cases, the baits may be supplemented with a partial or complete barrier application.

The Products - There are four bait products on the market. Three are sold by professional pest control firms, while one is marketed directly to homeowners.

Sentricon- The most widely used termite bait is the

Sentricon Colony Elimination System. Despite only being marketed for three years, hundreds of thousands of structures have already been baited with Sentricon, including thousands here in Kentucky. The product has been installed on such national treasures as the Statue of Liberty and the White House. While there is still much to learn about Sentricon, dozens of independent research trials have confirmed its effectiveness when properly installed and diligently serviced by an authorized pest control firm. A detailed description of this baiting system can be found in our entomology extension publication *ENT-65, Termite Baits: A Guide for Homeowners.*

FirstLine- Some pest control firms are using this product as an alternative to Sentricon. Most are using the bait in combination with other forms of treatment, rather than as a "stand alone," as is often done with Sentricon. Research trials with Firstline have been inconclusive, and it has been difficult to determine what impact the bait, alone, is having on active termite infestations. As with all of the baits, the manufacturer is continuing to modify the product in hopes of optimizing performance (for more on FirstLine, see *ENT-65*).

Exterra- The newest bait on the market is the Exterra Termite Interception and Baiting System. This product was introduced late last year and is now being installed by a small, but growing, number of pest control firms. As with Sentricon, Exterra is often used as a stand-alone treatment. Both products kill by disrupting the molting process in termites. In terms of appearance, Exterra's in-ground plastic stations are brown and box-shaped (Sentricon's are green and cylindrical), and the untreated wood monitors are flat and affixed to each of the four sides of the station. When termites are found feeding on the wood monitors, the bait— consisting of loosely wadded, shredded paper toweling— is stuffed into the center of the station without removing the monitors. This feature is intended to reduce disturbance to termites already present.

It's too early to know how well Exterra will perform. Preliminary reports from some areas of the country have been encouraging, but there have been no such studies performed in Kentucky.

Spectracide Terminate- This do-it-yourself termite bait is discussed at length in entomology extension publication *Entfact-642: Do-It-Yourself Termite Baits: Do They Work?* Late last year, the Federal Trade Commission (FTC) and eight state Attorneys General (including Kentucky) filed a complaint in U.S. District Court alleging that the advertising claims about the product are deceptive and unsubstantiated. As part of a settlement agreement reached last week, the manufacturer will be permitted to sell Terminate in 1999, but with substantial modifications in their advertising claims. Notably, they will no longer be able to state that use of the product *alone* is effective in preventing or eliminating termite infestation or damage to homes. The manufacturer can advertise that the product "kills termites," but they must also state that Terminate is not recommended as sole protection against termites, and for active infestations, homeowners should get a professional inspection. For these and other reasons (discussed in Entfact-642), we remain cautious about recommending the product, especially to homeowners with an existing termite problem.

To Bait or Not to Bait... The most common question I receive from homeowners is "...which form of treatment — baits or barriers — is more effective, and *which would you choose if it were <u>your</u> home."* The question is a difficult one with no "pat" answer. Factors to consider in the decision are discussed at length in extension publication *ENT-65, Termite Baits: A Guide for Homeowners.* Clients considering a bait treatment are usually relieved to learn that their carpeting won't have to be pulled back, their floors automatically drilled or their stored items moved. No drilling, no noise, no dust, and no pesticide in the house are other often-cited advantages of baits.

Furthermore, some structures have construction features that make it difficult or impossible to treat with conventional methods (e.g., wells, cisterns, drainage systems, sub-slab heating ducts, inaccessible crawl spaces). Buildings with hard-to-treat construction elements are logical candidates for baits, since foraging termites are as likely to encounter bait stations installed around the foundation exterior as beneath the structure. Since baits are non-volatile, non-leachable solids, they can be used in the most sensitive treatment situations.

The biggest complaint, common to all of the current systems, is that baiting is a slow, prolonged process. Several months may pass before the termites find the untreated, belowground monitoring stations and begin to feed on the bait. Consequently, it is not uncommon for the elimination procedure to take more than a full year to complete. Although usually minimal, some degree of termite feeding and damage may occur before the slow-acting bait takes effect.

Baiting programs often are more expensive than conventional treatments. This is because the process requires multiple visits to the structure to monitor for termites, and to add or replenish baits as needed. Homeowners should consider both the initial treatment price and the annual renewal fee in making their

purchasing decision. *Failure to maintain their annual service agreement is a prescription for disaster with baits, since there is no residual pesticide left in the soil after the termites have been eliminated.* Ongoing structural protection depends upon diligent monitoring for new evidence of termites in the future.

So.... if the client (1) has limited income, (2) straightforward construction, (3) is amenable to having their wall-to-wall carpeting pulled back and their basement/slab floor, patio, porch, etc. drilled, and (4) is offered a renewable service agreement (guarantee) by the pest control company, a conventional 'barrier-type' treatment may be desirable. If one or more of these criteria cannot be met, the situation may warrant a bait job — but, ultimately, the customer must make the decision.

In closing, termite prevention and control is a *very* complex topic. Further information is provided in UK entomology extension publications, *Entfact-604: Termite Control: Answers for the Homeowner, Entfact-605: Protecting Your Home Against Termites, ENT-65: Termite Baits: A Guide for Homeowners, and Entfact-642: Do-It-Yourself Termite Baits: Do They Work?*

DIAGNOSTIC LAB - HIGHLIGHTS

by Julie Beale and Paul Bachi

In the past two weeks, we have seen wheat samples with cold injury and general symptoms of stress, as well as a case of barley yellow dwarf and wheat spindle streak mosaic viruses occurring in complex.
We are beginning to see a few tobacco float samples with spiral root.

On greenhouse ornamentals and vegetables, a number of infectious disease problems were diagnosed, including: Botrytis blight on coleus and tomato; black root rot on pansy; powdery mildew on petunia; and bacterial blight of geranium. Non-infectious problems on greenhouse samples included sunscald on tuberous begonia; iron toxicity on geranium; and foliar distortion (related to wet growing conditions) on New Guinea impatiens.

From the landscape, we have identified fruiting bodies of Ganoderma lucidum on pin oak, which can indicate potentially serious root and butt rot. We also had a question concerning apparent "dead spots" in fescue lawns. These were actually patches of dormant warm-season grass (zoysiagrass, in this case) in the lawn. Warm season grasses will begin to green up in another month or so.

PESTICIDE NEWS AND VIEWS

EPA RELEASES FOOD QUALITY PROTECTION ACT (FQPA) BROCHURE
By Monte P. Johnson

On February 12, 1999, the U.S. Environmental Protection Agency (EPA) released a right-to-know pesticide brochure and website informing consumers and their families on practical steps to reduce their exposure to pesticides used on food. These information products are being issued as part of an EPA program to help consumers reduce dietary exposure to pesticide residues and maintain a healthy diet. The brochure and website mark a first step in the EPA program to inform the public about the risks and benefits of pesticide use. The website provides more specific information on how EPA regulates pesticides, organic farming practices, what the pesticide residue limits are on food and the health problems pesticides may pose. Copies of the brochure are being distributed to more than 40,000 grocery stores nationwide and also are available to consumers by calling 1-800-490-9198. The new website can be accessed at: <www.epa.gov/pesticides/food>.

EPA Press Release.

TRAP COUNTS - PRINCETON

March 12 - 19

True Armyworm	28
Black Cutworm	0

March 19 - 26

True Armyworm	2
Black Cutworm	2

Lee Townsend, Extension Entomologist