UNIVERSITY OF KENTUCKY
COLLEGE OF AGRICULTURE
Lexington, KY 40546-0091

COOPERATIVE EXTENSION SERVICE

KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY •AGRONOMY

On line at - http://www.uky.edu/Agriculture/kpn/kpnhome.htm

Number 804 March 16, 1998

ALFALFA

EXPECT LITTLE EFFECT ON WEEVILS FROM LAST WEEKS' COLD SNAP

By Lee Townsend

Last week's cold temperatures should have little effect on alfalfa weevil populations. Temperatures of about -7 to -10 ºF or below are needed to kill the egg stage. Small larvae are killed by temperatures of about 0 to -5 ºF. Lethal temperatures for larger larvae are in the 10 to 15 ºF range. This is the temperature needed within the stem for eggs or in the tip foliage for larvae. Alfalfa stems and leaf tips probably provide some protection so temperatures there are a little warmer than the air temperature. Snow cover provides some insulating protection, too.

Location	Degree day totals (3/15)
Bowling Green	156
Glasgow	219
Grayson	136
Lexington	118
Princeton	192

Field visits to detect tip feeding should begin when 190 degree days (base 48º F) have accumulated in your area. The table above shows data for several sites in the state. In general, alfalfa weevil populations are expected to be average, or below average in 1998. Put the priority on established fields where weevils have been a chronic problem.

TOBACCO

CONSIDERATIONS DURING METHYL-BROMIDE FUMIGATION OF FLOAT-TYPE TRAYS

by William Nesmith

Methyl bromide fumigation can be an effective means of disinfecting float trays, especially for the control of *Rhizoctonia*. However, certain precautions on the label must be followed to avoid serious injury and to obtain the desired effects. Yes, Kentucky's tobacco farmers have considerable experience with using methyl bromide, as they have used it since it first became available to fumigate soilbeds. BUT, it is important to realize that use in a soilbed is different than using it to fumigate trays.

Please urge all operators using this product to read

and follow the label. Fumigation of contaminated soil and trays is implied under Section F of the methyl bromide label (Potting Mix Fumigation Directions).

The fumigation event should take place outdoors or in a well-ventilated area away from occupied buildings. The fumigation chamber should be made of 4 mil polyethylene or greater thickness. Methyl bromide will penetrate polyethylene and with the low rates in use, the thick plastic is required to retain the gas for reasons of efficacy and safety. Trays to be fumigated should be loosely stacked, no more than 5 ft high. Methyl bromide is heavier than air, so evaporating pans are essential for the volatilization and uniform dispersion of the fumigant, with introduction of the fumigant at the top and center of the stack. Be very careful to set the pans and can-holders on solid supports if the manual compression method is being used (pushing down on the cans to puncture them). I strongly recommend delivering the fumigant from outside the fumigation area via delivery tubes connected to special openers. Anchor the fumigant-delivery tubes with tape or weights so they do not move about as the gas is discharged through them. Before the gas is delivered, seal the edges of the plastic sheeting to prevent escape of the fumigate. The temperature in the fumigation chamber (inside the plastic covers) should be 60° F or above. The rate of fumigant is 1 lbs / 1000 cubic yards. Higher rates are not authorized by the label for this method of fumigation. The fumigation exposure period should be 24-48 hrs, followed by ventilation and aeration periods.

Methyl bromide is an extremely hazardous liquid / vapor. It can cause serious damage to the skin and nervous system and even death if inhaled. A small amount of chloropicrin (2%) is added as a warning agent. Follow all safety precautions carefully. Especially important are the following points:

‣Never fumigate alone. Two trained persons must be present during introduction of the fumigant.

‣Handle fumigant in the open and stay "upwind" from the containers and during ventilation.

‣After fumigation is complete, (=ventilation), realize this heavier-than-air fumigant will be concentrated near the floor and low sides, so be sure to open the plastic at its lowest point.

‣Unseal opposite ends of the plastic and allow it to aerate for at least 30 minutes before completely removing the tarp. If the plastic bale-bags are used, cut them open after the 30 minutes of initial ventilation to insure all the trapped gas has dissipated. Some growers have experienced injury to their feet from walking into pockets of trapped gas several hours later, especially on cold days.

‣Immediate use of fumigated trays can result in phytotoxicity, so aerate trays for 24 hrs after the plastic has been removed.

SMALL GRAINS- WHEAT

WHEAT FOLIAR FUNGICIDE UPDATE - CHANGES ON THE HORIZON
by Don Hershman

Foliar fungicides have become an integral part of intensive wheat production systems in Kentucky. This is because foliar diseases cause annual economic losses ranging from $2 million to $35 million, depending upon the season. Producers have come to realize that much of this yield loss can be prevented with an appropriate fungicide application.

Fungicides are labeled which control key fungal diseases, but the main fungicide used by farmers, Tilt 3.6 E, has a label restriction which prohibits use of the fungicide later than flag leaf extension (Feeke's 8). This timing of application is usually too early to achieve maximum advantage when using Tilt, but later applications have not be allowed because of residue issues. This has been an unfortunate situation since research and experience in Kentucky, and many other states, indicates that fungicide applications made during head emergence usually out-perform those made during flag leaf emergence in years were a fungicide treatment is warranted.

The main alternative to Tilt has been a mixture of Bayleton and mancozeb. Together, these products will provide acceptable control of leaf rust, powdery mildew, and leaf and glume blotch when applied prior to infection. Recently, however, wheat has been removed from the Bayleton label. And although existing stocks of Bayleton manufactured prior to December 1, 1997 may still be applied to wheat, the reality is very little Bayleton will be available for use by Kentucky's wheat producers. Moreover, mancozeb applied by itself can provide good control of leaf and glume blotch and leaf rust, but because the product must be applied prior to infection, appropriate timing is difficult to achieve. Other factors which limit the use of mancozeb alone include a short period of activity and the fact that tissue which emerges after an application is not

protected.

The above situation has created an emergency because: 1) an acceptable alternative to Tilt which may be applied after flag leaf emergence no longer exists, 2) the high probability that one or more diseases will reduce wheat yields in Kentucky and 3) the unlikelihood that those losses could be prevented by a Feeke's stage 8 or earlier application of Tilt. In response to this emergency situation, the Kentucky Department of Agriculture with the support of Bayer Corp. and the University of Kentucky, has applied for an Emergency Exemption Section 18 of FIFRA to allow the use of Folicur 3.6F on wheat up to and including Feeke's stage 10.5 (full head emergence) . This application is currently under review by the EPA.

Coincidently with the above Section 18 application, Novartis, the manufacturer of Tilt has recently petitioned the Kentucky Department of Agriculture for a section 24 C label for Tilt to allow application up to and including Feeke's stage 10.5. This 24C application, which is based on new residue data and according to Novartis was made possible because of the removal of the Delaney clause and the establishment the Food Quality Protection Act. This 24C application for later application is currently under review by the Kentucky Department of Agriculture, Division of Pesticides.

Finally, many of you may have heard of a new Zeneca fungicide named Quadris. Quadris does not presently have a label for wheat, but all indications are that the product is on EPA's short list for a federal label. It is unlikely that this will happen in time for this crop season, but future prospects are excellent. Similarly, I've been told that a full federal label for Folicur is near. As with Quadris, however, this is unlikely to happen in time for this season.

Obviously, I do not know if anything will develop relative to labeling for Folicur, Tilt, or Quadris. However, this is the first time in a long time that I am optimistic that farmers will soon have the fungicide tools needed to control key fungal diseases of wheat.

TIMING OF HERBICIDE APPLICATIONS RELATIVE TO WHEAT GROWTH STAGE

By J.R. Martin

The recent cold front may have caused some damage to wheat, especially wheat growth that is well ahead of schedule. It will probably take a few days before damage from the freeze can be assessed. In cases where wheat is salvageable and fields have not yet been sprayed for wild garlic or other weeds, then a herbicide application may be warranted. The crop and weeds need to be actively growing.

Since the wheat growth is in many cases well ahead of schedule, growers should check the growth stage before applying herbicides. The following table summarizes the recommended growth stages for selected herbicides.

Table 1. Timing of Herbicide Application Relative to Wheat Growth Stage.

Herbicide	Recommended Wheat Stage*
Banvel	Feekes 3 - 5
Buctril	Feekes 1 - 9**
2,4-D	Feekes 3 - 5
Harmony Extra	2 leaf to Feekes 7**
Hoelon	Feekes 1-5
Sencor	3 tillers to Feekes 5

** Most of these stages are presented in Feekes scale. Consult label(s) for specific directions.*

*** Poor weed control may occur when applying Buctril or Harmony Extra at the later recommended stages.*

Wheat injury from such herbicides as 2,4-D and Banvel can occur, particularly as wheat advances in its growth. As a general rule, wheat is most tolerant to 2,4-D when plants are fully tillered.

Research results from Nebraska help support this statement (See Figure 1). According to these data wheat yield was reduced by more than 20% when 2,4-D amine was applied in the fall to wheat with 2 to 4 leaves. A 10% reduction occurred when 2,4-D was applied in the boot stage. Applying 2,4-D to fully tillered wheat did not result in a significant loss in grain yield.

The risk of injury when applying 2,4-D after tillering may be slightly greater with the ester formulations

than the amine formulations. This may explain why label directions for many of the ester formulations caution growers to apply after wheat is fully tillered (Feekes growth stage 5), but not forming a joint or node in the stem (Feekes growth stage 6). Regardless which formulation, it is especially critical to NOT apply 2,4-D when wheat plants are in the boot stage.

Banvel applications MUST be made prior to jointing stage. General observations indicate that the risk of significantly reducing yield when applying after wheat develops a joint tends to be greater with Banvel than with 2,4-D.

EFFECT OF TEMPERATURES ON WHEAT INSECTS
By Doug Johnson

Last weeks' low temperatures may have a huge effect on the 1988 wheat crop. So much so that insect problems will be very secondary in importance. However, if you have wheat which you feel will make a crop and you plan to continue your management of that crop then you must also continue to manage the insect pests.

In general terms temperature affects insects in much the same way it affects plants. Any insects that were out and active when the low temperatures arrived are probably dead. Remember, we are talking biology so nothing is absolute. However, any active populations would have been reduced severely.

Some insects that were still in the overwintering stage may have been killed but most probably survived. Late winter freezes happen quite often so many insects have adapted to this type of weather.

Control of aphids for BYDV is probably a moot point, although I am sure a few have survived. Cereal leaf beetle and armyworms may be delayed by the cool temperatures but you will still have to watch for them. The English grain aphids that often feed on heads in cool wet springs are harder to predict. They are not very tolerant of cold weather and thus are hard hit by cold snaps. However, this is a bit early for them to be active so they may still have been overwintering and thus protected. My guess is that the weather from here on will be more important in deciding their populations size.

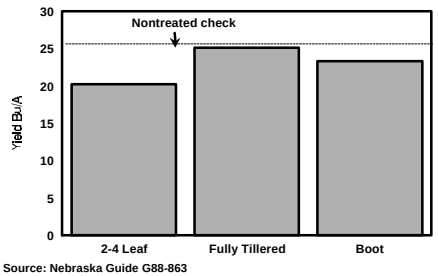
SHADE TREES AND ORNAMENTALS

FREEZING SPRING WEATHER AND DISEASE
by John Hartman

Expect this to be a difficult growing season for many plants in the landscape due to the recent injurious episode of cold weather. A relatively mild winter and some warm temperatures earlier this month induced plants to begin new growth, only to be subjected to freezing weather last week. During the week of March 5-12, forsythias were in bloom, flowering crabapple flowers were at tight cluster, flowering pear flowers were nearly at the "popcorn" stage, and other plants were in typical springtime phenology, but a few weeks earlier than normal. High and low temperatures at selected locations last week were Bardstown, 69 and 5°F; Bowling Green, 73 and 13°F; Covington, 68 and 7°F; Cumberland Gap, 72 and 14°F; Henderson, 70 and 10°F; Lexington, 70 and 9°F; Louisville, 74 and 13°F; Mayfield, 70 and 12°F; Princeton, 71 and 8°F; Quicksand, 72 and 11°F; and Somerset, 69 and 11°F.

Although it remains to be seen just how much woody plant tissue was injured by the cold temperatures, there is already some injury and it will provide entry for many disease-causing microbes. Expect to see fungal canker development on some of the dead tissues of twigs and branches. Opportunistic fungi such as *Botryosphaeria*, *Cytospora*, and *Sphae*

FIGURE 1. Winter Wheat Yield in Response to 2,4-D Amine Applied at 3 Growth Stages in Absence of Weeds



Source: Nebraska Guide G88-863

ropsis are known to attack freeze- and frost-injured tissues. Fire blight, a bacterial disease of many rosaceous plants in the landscape (such as flowering pears, crabapples, firethorns and cotoneasters), may also cause problems related to cold injury. The bacterium may invade injuries, possibly some of those caused by frost. In addition, succulent new growth (which develops as a result of latent lateral buds breaking after shoots have been killed) may be more susceptible to fire blight.

Landscape flowering crabapple and pear twigs were recently examined for indications of injury that might allow diseases to develop. Besides the obvious browning of new, expanding leaves and flower petals, there is browning of twig phloem and cambium tissues just under the bark of affected trees. Most twig xylem tissues were still green, but some woody fruiting spur xylem tissues were brown. Thus there will be plenty of dead woody tissues for fungi to colonize. Expect the injuries to vary between different cultivars and locations.

As the spring progresses, look for holes and tattering of newly unfolded leaves, symptoms typical of frost injury to buds. Ash trees having ash yellows disease may decline rapidly due to poor cold hardiness resulting from the disease. If primary vegetative buds have been injured, healthy trees and shrubs will develop new shoots from latent buds below the injured tissues, so plants with adequate energy reserves should produce growth that will soon mask the injury.

Plants at greatest risk are those that have been under environmental or other forms of stress over the past few years. There is relatively little that can be done to revive plants suffering the extreme effects of the freeze. Plants which have not been grossly disfigured can be helped by the following guidelines: 1) Provide adequate moisture through dry periods regardless of the time of year. 2) As live foliage appears, remove dead wood to improve the visual appearance of the plant as well as reduce the potential for future problems. Dead tissue can act as a good entrance site for insects and canker and wood rotting organisms. 3) Do not fertilize plants now with high nitrogen fertilizers.

LAWN AND TURF

QUESTIONS REGARDING BIO-TREK BIOLOGICAL FUNGICIDE FOR TURF DISEASES

by Paul Vincelli

Many who work in the area of turf maintenance are interested in reducing inputs of synthetic pesticides while still maintaining turf quality. Thus, when nonchemical products become available for pest management, there is a great deal of interest in them.

Recently, a commercial biological control material has become available for control of certain turf diseases. Bio-Trek 22G contains the active ingredient *Trichoderma harzianum*, and is the first commercial biological control product for turf disease control. Bio-Trek 22G and related products are marketed by BioWorks, Inc, Geneva, NY.

What does it do?

T. harzianum is a fungus that attacks, weakens, and kills certain fungi that cause diseases in turf, namely those that cause Pythium blight, dollar spot, and brown patch. Its effectiveness may be based on at least two things: its ability to parasitize these fungi, as well as possibly out-compete them in the thatch zone before they have a chance to begin infecting turfgrasses. Studies in New York have shown that this strain of *T. harzianum* is "rhizosphere-competent", which means it survives well for weeks in the root zone of turf plants.

Is it labeled?

The granular formulation is registered with the U.S. EPA and has an exemption from tolerance. When I checked with the Kentucky Division of Pesticides in late January, 1998, Bio-Trek 22G had no state label for use in Kentucky. Thus, I do not anticipate its sale in Kentucky in the near future. However, this situation could change in short order. Furthermore, turf managers in other states where it is being marketed are asking questions about it.

Is it effective for disease control?

No, not in the sense that turf managers normally think of when they use the word "effective". I've conducted research on this product since 1995. The following table summarizes my research results thus far. Details of these studies are available in Volumes 51-53 of the journal *Fungicide and Nematicide Tests.*

Other research studies conducted elsewhere show similar results to what I've seen. Even in upstate New York, where the product was developed, the product usually does not completely prevent disease development. It may simply reduce dollar spot development or delay it's onset.

Where does it fit?
First of all, it may not be available in all states since it is not yet labeled in all states where dollar spot occurs.

Second, Bio-Trek formulations are really very much products still under development. For example, several years ago I postulated that evening applications of this product would be more effective than morning applications. In contrast to standard turf fungicides, *T. harzianum* is a living organism, and has to be treated that way. Consider that application during an early morning dew may cause the spores of *T. harzianum* to germinate just in time to be killed by heat and UV light after the dew dries. Conversely, evening application gives the fungus all night to become established in the thatch and the leaf surface. However, I have not had a chance to test this in my own research, nor has anyone else, to my knowledge.

Another example. Dr. Mike Boehm of Ohio State University has seen preliminary evidence that Bio-Trek performs better when applied in combination with a compost topdressing. This researcher notes that this isn't surprising since *T. harzianum* really thrives in organic matter. But he also notes that this has been tested in only one season.

These examples illustrate the point that Bio-Trek formulations are products under development. There is not enough of a research base to really know how best to use *T. harzianum* for disease control in turf swards. As always, turf managers who like to be on the cutting edge of a new development may wish to experiment with the product where it is available. But recognize that this product is not yet as reliable as many of the standard cultural and fungicidal choices which are available for control of dollar spot, brown patch, or Pythium blight.

Table 1. Summary of Results With Bio-Trek Formulations for Dollar Spot Control, University of Kentucky, 1995-1997.

Year	Disease pressure	Bio-Trek treatment	Range of disease severity in controls[1]	Results with Bio-Trek formulations
1995	Severe	G in early Jun + weekly applications of WP	Water: 1.2 to 5.7 DSIC[2] DMI / chlor mix: 0.0 to 0.1 DSIC	Better than water on only 1 of 8 assessment dates, even then had 0.7 DSIC[2].
1996	Severe	WP weekly	Water: 1.6 to 4.5 DSIC DMI / chlor mix: 0.0 DSIC	Was better than water on 6 of 10 assessment dates. Hovered around one DSIC, for several weeks but reached 4.7 DSIC.
1997	Light	WP weekly, with Heritage @ 0.2 oz biweekly	Water: 0.4-1.0 DSIC DMI / chlor mix: 0.0 DSIC	Was better than water on only 1 of 4 assessment dates, and reached 0.7 DSIC 9 days later.

[1]Water is applied weekly as a negative control treatment. A tank-mix of a DMI fungicide (Banner, or Bayleton, or another DMI fungicide) with chlorothalonil is used as a positive control treatment.
[2]DSIC indicates no. dollar spot infection centers per square foot.

LAWN PREEMERGENCE CRABGRASS CONTROL

By A. J. Powell, Jr. and J. D. Green

With alternating warm and cold weather, we do not expect crabgrass to germinate earlier this year than usual. The usual target date for applying preemergence herbicides is April 1 in southern/western Kentucky and April 15 in central/northern Kentucky. In most years, crabgrass does not germinate until two - five weeks later than the target date. Therefore, as long as crabgrass has not begun to germinate, you can extend the target date by one to several weeks.

All of the preemergence products marketed in Kentucky are very good---that is if the correct rate is used. Our research has shown that the normal rate that is listed on the product bag is okay for moderate crabgrass but is not high enough if the crabgrass pressure is high and if the turf is severely stressed in the summer. The commercial lawn care companies will generally make a second application in order to extend the control to late summer.

The major homeowner products are: (1) benefin + trifluralin (Team), (2) pendimethalin (Pre-M, Halts), (3) dithiopyr (Dimension) and (4) prodiamine (Barricade). These products will be marketed under various trade names, however the label should list the common chemical name or a proprietary name such as those listed above.

In general, the granular products are somewhat more effective than liquid applied products and very few liquids are available on the homeowner market. The granulars are either applied on an inert carrier or on fertilizer. Very few garden centers stock the granulars on inert carriers. Most products therefore are dual purpose---control crabgrass and feed the turf. Because the nitrogen fertilizer does encourage early top growth, it increases surface shading and often will help decrease crabgrass establishment. Unfortunately the nitrogen also causes excessive mowing, increases some disease problems, reduces root growth, increases summer heat stress, causes greater infestation of summer weeds, etc. Therefore, when possible, try to buy granular products without fertilizer.

Organic products containing corn gluten are now being marketed for crabgrass preemergence control. These contain lots of organic nitrogen and the turf becomes excessively lush. Our 1997 research results indicated that the corn gluten product controlled only about 50 % of the crabgrass, the same control as an equivalent rate of urea nitrogen.

VEGETABLES

STINK BUG MANAGEMENT IN TOMATOES

By Ric Bessin

Stink bug damage is one of the more difficult to control insect-related problems in tomatoes. Stink bugs use their piercing-sucking mouthparts to feed on unripe and ripening fruit. This causes whitish-yellow corky spots underneath the skin of the fruit. The damage becomes noticeable only after the fruit begins to ripen, which may be several weeks after the feeding occurred. This damage is serious for fresh market tomatoes and whole pack processing tomatoes because they render the fruit unmarketable. Stink bugs usually first appear in field margins and border rows, especially borders nearest woody vegetation.

The brown stink bug is the most damaging of several species of stink bugs that feed on tomato. Stink bugs have a distinctive shield shape, are about 1/2-inch long when full grown, and produce an odor when handled. Adults are dark brown on top and yellow to tan underneath. The immature stages, called nymphs, resemble adults but are smaller and lack wings. Until they are at least half grown, the nymphs usually remain grouped together on or near the plant on which they hatched.

Stink bugs overwinter as adults in sheltered areas and crop residue. They become active again in early spring with adults usually laying about 100 barrel-shaped eggs in groups of about 25 to 70. Eggs hatch in about a week: the resulting nymphs become adults in five to six weeks. Adult stink bugs migrate from weedy areas into tomato fields, particularly when other plants begin to decline. On green fruit, stink bug damage appears as a pin prick, surrounded by a light discolored area. This may turn yellow or remain green on ripe fruit and the tissue below these spots corky.

Management of stink bugs needs to begin early in the season before tomatoes begin to fruit. Stink bugs move from weeds surrounding the field so regular mowing of weeds around field margins is important. Irregular mowing and allowing weeds to go to seed prior to mowing may encourage stink bugs to move to tomatoes. If any stink bugs are found in a 40 plant sample when scouting, then a stink bug treatment is justified. Keep in mind when scouting, that stink bugs readily drop to the ground when disturbed and may be difficult to see. There are no traps or other monitoring devices available for stink bugs. Thiodan, Penncap-M, Warrior, and Baythroid provide good

control of stink bugs on tomatoes.

PESTICIDE NEWS AND VIEWS

24C HERBICIDES FOR VEGETABLES

According to Lois Shipp of the Division of Pesticides in Frankfort, 24C labels for Command 4EC for cabbage and cucumbers are in effect until July 29, 1998. 24C labels are good for 1 calendar year. You must have a copy of the 24C label as well as the Federal label when you use these pesticides.

1996 KENTUCKY PESTICIDE SALES SURVEY By Monte P. Johnson

The Kentucky Department of Agriculture, Division of Pesticides, has released the results of its annual survey of registered agricultural chemicals. The information for the 1996 growing season has 14,748 records from 344 dealers in 109 counties. Atrazine (AAtrex) continues to be the most used pesticide product followed by metolachlor (Dual, Bicep II), glyphosate (Round Up), maleic hydrazide (MH-30), and acetochlor (Topnotch, Surpass) rounding out the top five. Methyl bromide (Brom-O-Gas) has dropped to sixth place followed by pendimethalin (Prowl, Squadron), paraquat (Gramoxone Extra), 2, 4-D (2, 4-D, Crossbow, Weedone), and fatty alcohols (Sucker Plucker, Off-Shoot-T). (KFACA News, February 1998)

METHYL BROMIDE UPDATE

The scheduled phase-out of the fumigant, methyl bromide, by 2001 may undergo some changes in the near future. Since methyl bromide is classified as an ozone depleter, it comes under regulation by the Clear Air Act (CAA) as well as the Montreal Protocol. The CAA classifies ozone-depleting substances as Class I and II materials and mandates their phase-out, while the Montreal Protocol makes no classification, leaving phase-outs to be voted on by member countries. While the CAA provides for no exemptions or essential uses, the Montreal Protocol allows both. At the 1997 Montreal Protocol meeting, developed nations of the world agreed to phase out methyl bromide in 2005, with interim reductions of 25% in 1999, 50% in 2001, and 70% in 2003. Meanwhile, the developing nations have committed only to freezing the use of methyl bromide at their average use between 1995 and 1998. They'll reduce use from that level by 20% in 2005 and phase out use in 2015. This will result in foreign competitors having access to methyl bromide well into the next century, making the economic viability of alternatives more questionable. What may be economically viable if everyone loses methyl bromide may not be viable if only some producers lose it. Consequently, USDA's Economic Research Service will lead a study of the impact the ban will have on the U.S. agricultural economy. Some of the potential chemical alternatives to methyl bromide include vapam, basamid, chloropicrin, and Telone C17 and C35. Potential non-chemical alternatives include cover crops, heat treatments, and steam solarization. Research into alternatives includes a soil bacterium that degrades methyl bromide, reducing the chance of escape to the atmosphere, examination of "phyto-oils," materials produced by plants that kill or repel insect pests of stored products and cut flowers, refrigerated controlled atmosphere storage of fruits, and plant extracts to control fungal pathogens in soils. (Methyl bromide alternatives, January 1998).

DIAGNOSTIC LAB - HIGHLIGHTS

by Julie Beale and Paul Bachi

We are continuing to see **Sclerotinia crown and stem rot** on forages, namely, **alfalfa** and **red clover**. We are also beginning to see a fair number of samples of **wheat** with **wheat spindle streak mosaic virus**. (See 03/09/98 KPN article on this disease and note that both diagnostic laboratories are equipped to run ELISA tests for this virus and for wheat soilborne mosaic virus.) Also diagnosed was **barley yellow dwarf virus** on **oat.**

Seed geraniums with severe **blackleg** (caused by Pythium) were diagnosed last week. This disease is directly related to saturated soil (growth medium) conditions and can be quite widespread in greenhouses with water management problems.

Also diagnosed was **Scots pine** with **pine wilt nematode**.

Lee Townsend
Extension Entomologist

COOPERATIVE EXTENSION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF KENTUCKY
COLLEGE OF AGRICULTURE
LEXINGTON, KENTUCKY 40546

AN EQUAL OPPORTUNITY EMPLOYER

BULK RATE
POSTAGE & FEES PAID
USDA
PERMIT No. G268

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300