

Pest Alert

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NOTE: BEGINNING JANUARY, 2001, PEST ALERT WILL ONLY BE AVAILABLE ON THE WEB. FOR ELECTRONIC NOTIFICATION, PLEASE EMAIL YOUR ADDRESS TO bspm@lamar.colostate.edu. (Check out our complete web site!)

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POTATO UPDATE

Potato Late Blight Models have exceeded the threshold level of 18 Severity values at various locations across northeastern Colorado. See Pest Summary
Potato Early Blight Models area approaching the threshold level of 300 at many locations across northeastern Colorado. See Pest Summary.
Early spring conditions in eastern Colorado during May have provided adequate moisture and cool to moderate temperatures which favor the emergence of volunteer plants from last season's fields where pathogens may have been present. Scout these areas for evidence of overwintering and infection by pathogens such as rust of bean, purple blotch of onion, and early blight of potato. Destroy these sources of inoculum, which can be spread by wind, water and implements to new crop fields during June.

ONION UPDATE

The recent moisture and relatively cool conditions could be favorable for early-season outbreaks of diseases like Downy Mildew in northern and southern Colorado. There are NO reports of the disease on onion transplants yet, but a fungicide program may be beneficial if

Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating.
Cooperative Extension programs are available to all without discrimination.

the threat and weather conditions persist during mid June. Purple Blotch forecast models are approaching 275 – 300 in the northeastern part of Colorado for fields with an emergence date of April 1, so scout aggressively for early signs of disease. The west slope and Arkansas Valley regions are still below the threshold with their warmer and drier averages.

Effective fungicides include Bravo, EBDC (maneb, mancozeb, ManKocide, penncozeb, Dithane), and Ridomil package mixes (with EBDC, copper, Bravo/Equus). Bravo/Equus, ManKocide and EBDCs are protectants that may have to be applied every 7 - 10 days, while the Ridomil provides protection against Downy Mildew for 14 days or longer in the threat persists. The EBDC and Bravo/Equus products and Rovral are effective against Purple Blotch.

If there is a history of bacterial soft rot in your fields or area, you may want to include a copper-based bactericide (Champ, NuCop, Kocide, ManKocide, etc) as older transplants near bulbing.

DRY BEAN UPDATE

The May and June weather data from COAGMET illustrate that 2001 has been cooler and wetter than experienced in northern and southern Colorado production regions during the 2000 season. The west slope averages are similar to 2000 - warm and dry. Bean rust was confirmed on volunteer beans northeast of Haxtun, CO in early June. A recent survey to northwestern Nebraska detected volunteer beans, but no signs of overwintered rust in fields that were infected in 2000.

The moist May and early June could favor pest development from the 2000 crop debris and volunteers. Scout last year's fields for evidence of overwintering of key pests of bean (rust, Mexican bean beetle), onion (downy mildew, purple blotch, Botrytis, maggots), and potato (early blight, late blight, Colorado Potato beetle).

Use sanitation (cultivation, plowing) and selective herbicides to remove these overwintered plant sources of pests before they can be moved into new crop fields located downwind or downstream from these infested sites. Aggressively scout new crop fields for evidence of early development by these pests before implementation of pesticide programs. Monitor COAGMET weather patterns and pest forecast models, and share pest sightings with VEGNET personnel. (Schwartz)

KARNAL BUNT IN THE NEWS AGAIN

Karnal bunt (syn partial bunt) is in the news again. An associated press release out today (6-24-01) is guaranteed to generate some panic and paranoia. Two weeks ago I pointed out in the Pest Alert that 2 counties outside the quarantine area in Texas had KB confirmed and had been quarantined. Well now it is 6 counties, Archer, Baylor, Throckmorton and Young in north central Texas just south of the Oklahoma state line and McCulloch and San Saba counties in central Texas (see map). The areas have been quarantined and all custom combines and seed cleaners must be disinfested prior to moving outside the quarantine area.

I have been watching the situation develop and last Wednesday attended a meeting of plant pathologists in Manhattan, Kansas and on Friday met with John Gerhardt of the Colorado State Department of Agriculture (CDA) and Darrell Hanavan, executive secretary of the

Colorado Wheat Growers Association. We have issued a joint news release that emphasizes that **Colorado is Karnal bunt free** and that there is minimal threat to Colorado growers at this time. Additionally we note that Colorado has been actively monitoring for KB since 1996 and are continuing this monitoring program in cooperation with the Animal Plant Health Inspection Service (APHIS) of the USDA.

Background

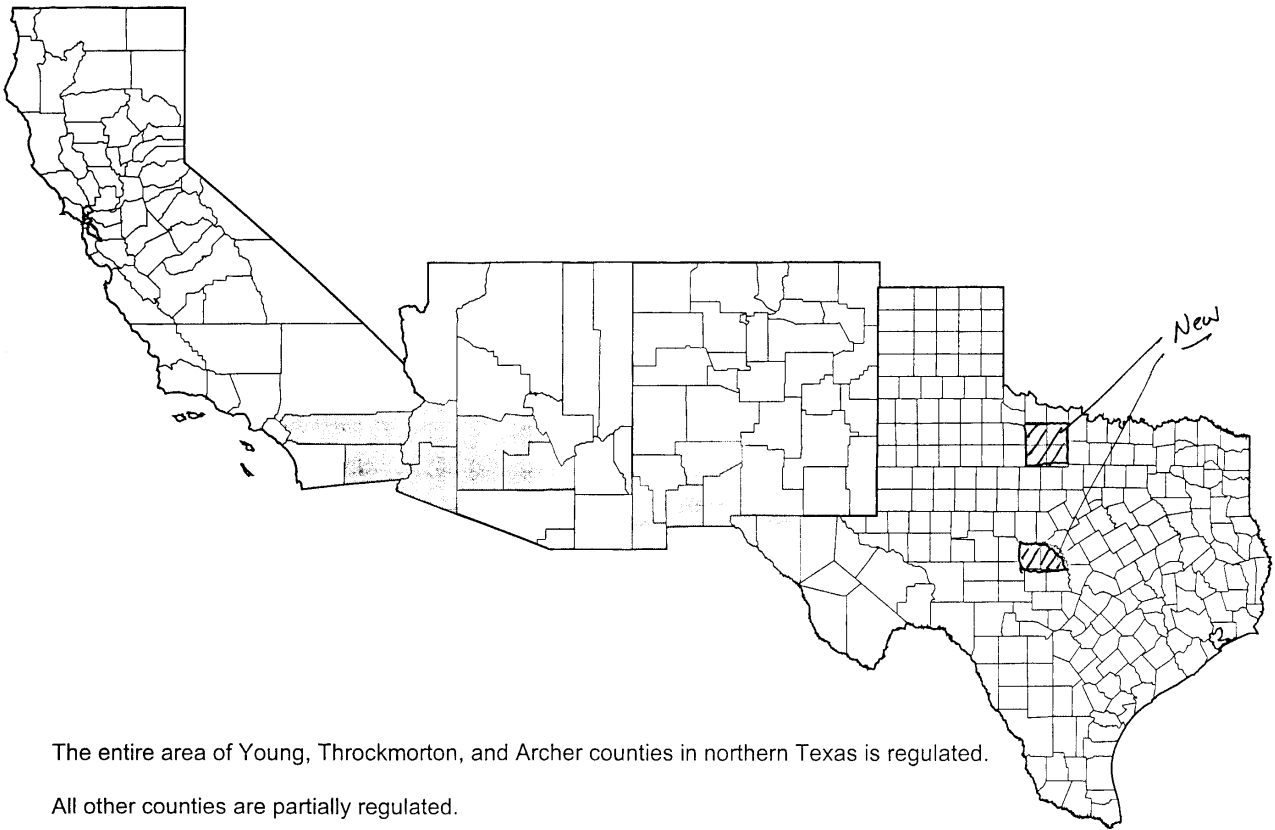
Karnal bunt, a smut disease, caused by the fungus *Tilletia indica*, was first reported in the U.S. in March 1996. Subsequently, many countries placed quarantines on wheat from the U.S. The following period saw a continuing circus of misinformation, over reaction by regulatory agencies and heavy damage to growers, processors and others dependent on the high plains' most valuable crop, wheat.

Initially only the infested areas near Phoenix, Arizona were quarantined. Subsequently, areas in California, New Mexico and Texas were also put under the quarantine. In California, wheat sampled in several elevators from the Imperial Valley in southern California all the way up to Butte County in northern California were found contaminated with Karnal bunt spores. Different year crops were stored separately back as far as 1993 and Karnal bunt spores were found in all of them. It appeared that the fungus was present in California at least since 1993.

Other places where KB-like spores were found were in Alabama, Florida, Oregon, Montana, South Dakota, Washington, and in seed cleaning equipment in one location in eastern Colorado. Different action was taken in each case. In some cases the crop was destroyed; others it was allowed to go to harvest but growers were unable to move it out of the quarantine area. In some instances, elevators or soil was fumigated with high levels (500 lbs. per acre) of methyl bromide; in others no fumigation was required.

Karnal Bunt Regulated Counties

as of June 19, 2001



The entire area of Young, Throckmorton, and Archer counties in northern Texas is regulated.

All other counties are partially regulated.

Regulatory action has been based on the premise that KB a) is a serious disease of wheat, b) quarantine will work, c) the fungus can be eradicated and d) zero tolerance for KB spores was valid as a basis for quarantine and eradication action. Professional plant pathologists do not agree with these premises (see APS policy statement below).

While Karnal bunt is a smut fungus disease, it is not an important disease in reference to yield and quality. It is not harmful to humans or animals. It attacks individual flowers in the developing head and under the most favorable conditions can turn grains of wheat to masses of smelly, microscopic black powdery spores. Although the original KB find in Arizona was limited to 4 durum wheat varieties, Reva, Durex, Ocotillo and Kronos, the fungus is generally considered to be a more important problem in bread wheat and there are no wheat varieties that are immune.

While the fungus can cause losses in yield and quality, these are generally minor. In India, where the disease occurs yearly, losses are on average about 0.5%. In some highly susceptible varieties, losses can range from 20-40% with as much as 89% of the grains being infected, but very few of these varieties are grown anymore. No disease levels of this nature have been found in the U.S. and in Arizona where it was originally reported to be the worst, the incidence was less than 0.1%. Evidently some of the fields in the newly reported Texas areas were above this level to some extent.

The disease, Karnal bunt, takes its name from the town, Karnal, India where it was first found. It is now limited mostly to the Indian sub-continent (i.e., India, Afghanistan and Pakistan) but was found in Mexico in the late 70's. In 1983, the U.S. placed a quarantine on Mexico for KB. Numerous other countries followed the U.S. action.

Karnal bunt survey

Presently, over 80 countries have quarantine restrictions on Karnal bunt. Most have agreed to accept wheat as long as it is certified as coming from a Karnal bunt free area. The only way to qualify as Karnal bunt free is through the ongoing Karnal bunt cooperative state surveys that Colorado is a part of.

In Colorado the survey was originally carried out by the Colorado Department of Agriculture and the samples were processed by plant pathology staff at Colorado State University. Funding support for the survey was supplied by USDA on a contract basis. Under the new agreement beginning this last year CSU survey staff collect samples and forward them to a diagnostic laboratory outside of Colorado for examination. This survey has been ongoing since 1996 and **to date, no Karnal bunt spores have been found in any Colorado samples.**

Karnal bunt development

Resting spores (teliospores), that can survive for long periods in the soil, germinate in the spring or summer and form infectious spores (sporidia) which are carried by air and splashed by rain to the florets of wheat during flowering (see life cycle diagram on page 7).

Optimum weather conditions for infection are warm temperatures (max. 19-23 C, min. 8-10 C) and high humidity or rain showers (or overhead irrigation). Infection of individual kernels takes place; hence the name partial bunt is used in some places.

Karnal bunt is not a systemic smut such as common, loose and dwarf smuts are. It is therefore very difficult to detect in the field, unless very heavy infection levels are present. The disease does have a fishy odor associated with it when grain contamination is high. Care should be taken because other smut fungi associated with wheat can also have a fishy odor. Teliospores are known to survive in the soil for at least 5 years.

Management

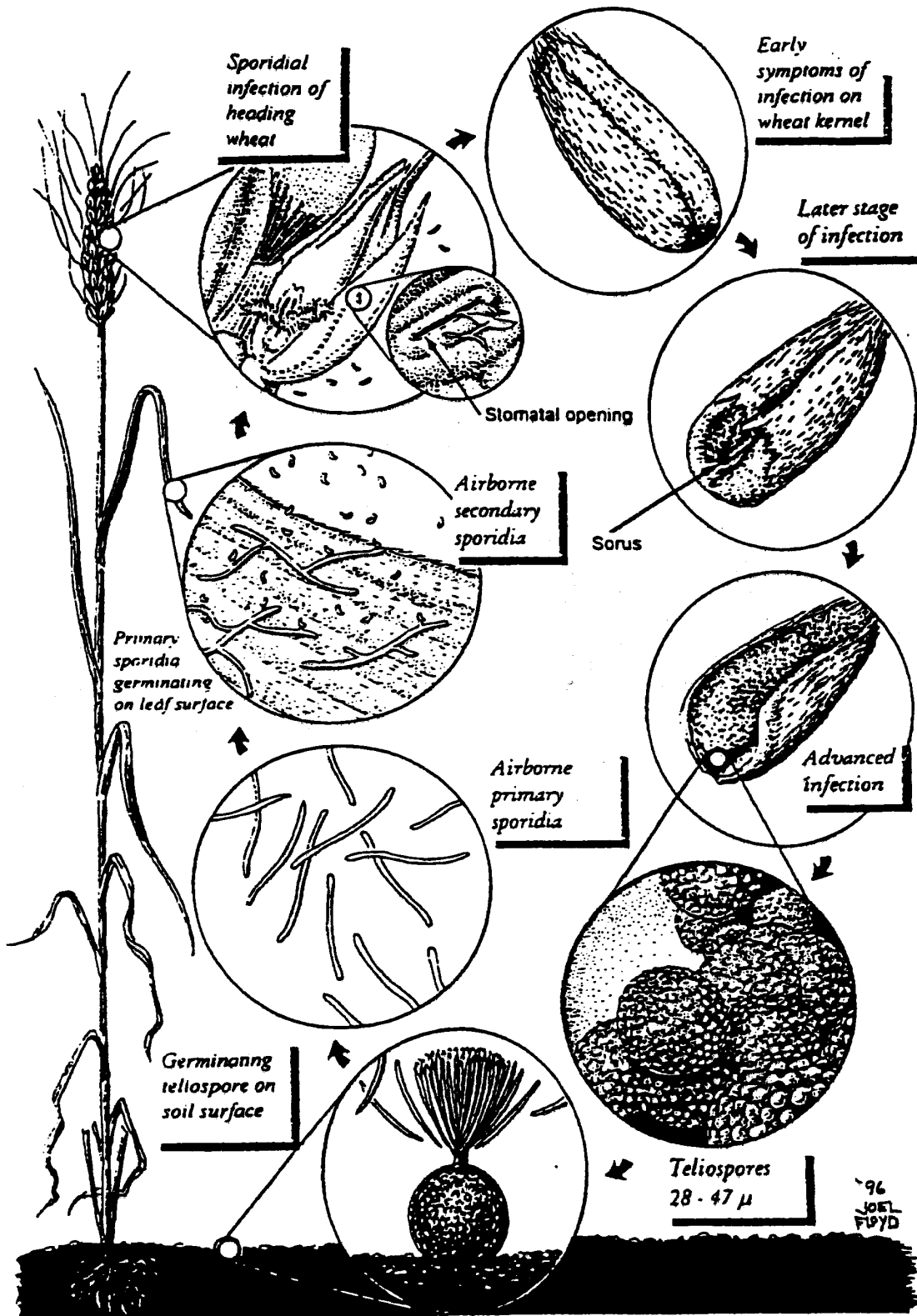
Historically, quarantine has been the major approach to control. This approach for the most part has been thought to be effective in the prevention of intercontinental movement, but now with the potential for wind dissemination of the teliospores and other forms of grain movement via equipment, animals and birds, it is no longer effective. A program of Karnal bunt suppression using an integrated approach is most realistic in cases where the fungus might pose a threat.

While seed treatments will not completely eliminate the fungus from seed, they are effective in reducing levels of inoculum. When, combined with other practices of certified seed use, resistant or tolerant varieties, long rotations and planting date manipulation, the fungus' potential impact on yield and quality is minimal.

Almost all plant pathologists working with small grain diseases consider KB not a biologically

significant threat, if any, to the winter wheat growing areas of the Great Plains. ***Unfortunately the problem is a market and political problem.*** With a zero tolerance held by over 80 countries, KB has the potential to be used as non-tariff trade barrier by other countries and even between states. It is this problem that will have the greatest impact on Colorado if the fungus is ever found here.

At the present time Kansas, Oklahoma and Texas authorities are reported to have done an excellent job in finding all the custom combines and other equipment that worked in the quarantine areas and insuring that they have been suitably treated. Oklahoma actually put up roadblocks on HWY 287 and other roads coming out of Texas to catch north moving equipment. So there appears to be little threat to Colorado growers.



The life cycle of Karnal bunt fungus.

But **Colorado growers should take the precaution** on insisting on knowing where their custom harvest people and equipment have been. If they have been in the quarantine areas they must have an APHIS certificate 540 or an Oklahoma State phytosanitary certificate showing the equipment has been satisfactorily disinfested.

And **added precaution is recommended** by plant pathologists in Colorado, Kansas, Oklahoma and Texas for custom equipment moving north that has not been in the quarantine area. A protocol for voluntary cleaning has been developed by Kansas plant pathologist Bob Bowden and follows this article. This will greatly reduce the risk of moving KB north from areas where it might exist in low levels and has not yet been detected. Such voluntary cleaning has the added benefit of reducing the movement of noxious weed seed as well.

Conclusion

Lack of information from regulatory agencies on Karnal bunt and the important nature of the quarantine to growers, processors and transportation prompted the American Phytopathological Society (APS) to establish an electronic symposium on the world wide web in May 1996 through August 1996. During that time, the APS council met and passed a policy statement regarding Karnal bunt. We firmly believe that August 1, 1996 position is still valid. It states:

American Phytopathological Society Policy Statement on Karnal Bunt

Karnal bunt is –

- 1) a disease which causes negligible yield losses in most cases
- 2) produces no harmful toxins to humans or livestock
- 3) spreads readily in seed, air currents, grain handling equipment, animals, etc
- 4) has been in the United States for more than 3 years and in Mexico for 25 years

"As such, eradication of Karnal bunt in the United States is economically unfeasible and a zero tolerance for teliospores in commercial grain is scientifically unjustified. We urge APHIS to move out of an eradication mode and into a management mode."

While the USDA/APHIS efforts at containment and eradication have been extensive, the emergence of the fungus outside the quarantine area supports the APS policy statement. The Karnal bunt quarantine area now includes counties in Arizona, California, New Mexico and Texas.

Efforts in the past and currently to eradicate the various infestations are proceeding in several ways. Equipment is decontaminated with the use of a bleach (Clorox type) solution, steam cleaning, high-pressure hot water and detergent or methyl bromide fumigation. In Arizona and elsewhere, infested fields continued to be monitored. Land infested with Karnal bunt has not been planted to wheat for at least 5 years. Infested fields in other states were plowed down prior to maturity and taken out of wheat for a minimum of 5 years.

I am told that APHIS will be starting their web page again to provide the latest information on Karnal bunt. I tried it this morning and it is not on yet but it should be up soon and to find it, go to the Worldwide Web and use the Karnal bunt page at:

<http://www.aphis.usda.gov/oa/gunt/kbhome.html>

For the most comprehensive information on KB, see the proceedings of the APS KB symposium go to the web site,

<http://www.apsnet.org>

The Karnal bunt debate continues but will not be resolved by science. The only resolution will be for APHIS to deregulate KB. APHIS action relevant to Karnal bunt in the past was not supported by science. It is critical for the wheat industry to organize and move to get KB off the quarantine lists of most countries where the organism could never thrive or for that matter even survive. This is of course easier said than done, but it is the only solution. (Brown)

CLEANING INTERSTATE COMBINES IS RECOMMENDED PRACTICE

In order to prevent the introduction of Karnal Bunt into Kansas, we are recommending a new "Best Management Practice" for wheat producers who use custom cutters or custom seed cleaners. All combines, grain trucks, and trailers coming from out-of-state should be thoroughly cleaned out before entering Kansas wheat fields. Seed cleaners should also be cleaned out thoroughly. This is a strong recommendation, not a legal requirement.

This precautionary measure will also help prevent the introduction into the fields of troublesome weeds such as cheat, rye, goatgrass and Italian ryegrass. We believe it should become a routine practice for custom cutters and seed cleaners entering the state.

Recommendations for cleaning a combine

An empty combine can still hold several bushels of grain, chaff, weed seeds, dust, insects, and diseases. Here are some suggestions for routine cleaning from Vernon Schaffer, director of the KSU Foundation Seed program and Bob Bowden, Extension plant pathologist. Rather than using a vacuum cleaner, steamer, or compressed air, we recommend low-pressure, high-volume water for cleaning. But there are lots of ways to get the job done. The goal is to remove virtually all of the debris to avoid contaminating the next fields. Be aware that this is not as stringent as the protocol used by USDA for cleaning combines from quarantine areas.

1. Try to do a preliminary cleaning before you leave the old field. Clean off the feeder housing and reel, open the trap doors, then run the machine until the loose grain is all out.
2. Select an area for cleaning with access to a water hydrant.
3. Remove the header and clean it separately.
4. Park on pavement where waste grain can be swept up and disposed of properly. You might want to tilt the combine to help drain the horizontal augers.
5. Open all the access doors, traps, and elevators and remove the sieves.
6. Run the machine until the loose grain is all out.
7. Use a garden hose and nozzle to dislodge debris. Start at the front and clean in the direction that grain flows through the machine. That way if you need to run the machine to shake some debris loose, you won't recontaminate an area you've already cleaned.

8. If possible, remove the concaves and wash the cylinder area. On some machines, the concaves will be very difficult to remove. Try using the water to thoroughly flush them in place. Continue cleaning toward the back of the machine.
9. Clean the grain tank and unloading augers.
10. Run the machine again to shake any remaining grain loose.
11. Don't forget to look underneath and clean debris and grain that collects on the undercarriage.
12. Dispose of waste grain, weed seeds, and debris in a landfill or bury it deeply.

Cleaning a combine can be hazardous, so always make safety a top priority. Wear proper eye protection and be especially careful when running with the access doors open.

NEMATODE TESTING

This is just a reminder that the CSU Plant Clinic does not test for nematodes. Some laboratories that do are listed below. Be sure to call before sending samples. Each lab will have a preferred way in which they want the samples collected, packed and mailed. Also our list of fees has yet to be updated. There are a couple of new labs that we will alert you to as soon as we get the specifics.

Plant Clinic

Department of Plant Pathology
Kansas State University
414 Throckmorton Hall 4032
Manhattan, KS 66506-5502

phone (913) 532-5810

Plant Clinic

448 Plant Science Bldg.
Dept. Plant Pathology
University of Nebraska
Lincoln, NE 68583-0723

phone (402) 472-2559

Nema-Test

8049 Lowell Ave
Lincoln, NE 68506

phone 402 465-2446

Nematology Diagnostic Laboratory

University of Idaho
SW Idaho R & E Center
29603 U of I Lane
Parma, ID 83660

phone (208) 722-6701

(Brown)

HEAT WILL BRING ON MELTING OUT AND OTHER TURF DISEASES

Even though we have had good moisture this spring and early summer, we will begin to see melting out, necrotic ring spot (NRS) and even dollar spot on many lawns. Much of this is brought on by the very high temperatures that we are having. In many of these problem lawns it will be necessary to try to bring them back slowly with deep watering, lengthening the mowing height and spot treatment with a fungicide.

Frequently melting out and NRS are the results of inappropriate cultural practices that will also need to be changed. These are stress diseases and anything that can be done to minimize stress will help to correct the problem for the long haul. In the case of necrotic ring spot, sometimes the crown and roots are completely rotted and the only way to carry the lawn through the hot periods is to lightly sprinkle the lawn during the hottest periods of the day. Do not over water because that will just make the root rot worse.

Fungicide generally is not recommended because it is just treating symptoms and not the basic cause. With melting out, fungicides such as Banner, Chipco 26019 and the new azoxystrobin, Heritage, can be used. If these are not readily available Daconil 2787 is still a good bet, if it is still available (it is being discontinued). In the future this fungicide may not be available to homeowners. It is also going to be necessary to rake out and dispose (composting will work) of the dead grass tissue and in some instances over seed.

When selecting and using a fungicide read and follow the label carefully. (Brown)

BENOMYL CANCELLATION REQUEST PUBLISHED

Well it is unfortunate but we are not only going to lose an excellent fungicide, but the really first systemic fungicide that was made commercially available. It has had an outstanding history and was responsible for bringing systemic fungicides into the popularity and essential role they now play in plant protection. On May 23, 2001, EPA published in the Federal Register a Notice of Receipt of Request for Registration Cancellations for benomyl (Benlate).

The technical registrant, Dupont, is discontinuing production of benomyl worldwide, for business reasons. The notice proposes cancellation of eight benomyl product registrations used on 73 food and feed commodities. Foods with significant benomyl use in terms of percent crop treated and total volume of use include mushrooms, squash, raspberries, celery, brussel sprouts, nectarines, rice, wine grapes, soybeans, almonds, apples, and peaches. The notice provides a 30-day comment period on the proposed cancellations. EPA will decide whether to approve Dupont's request for these voluntary cancellations after considering public comment. If the Agency accepts the registrant's request, the effective date of cancellation will be the date of publication of the cancellation order. EPA anticipates granting Dupont's request to sell and distribute existing stocks of canceled benomyl products until June 30, 2001, and accepting their suggestion that the Agency permit sale of existing stocks of products in the channels of trade until December 31, 2002. In a future Federal Register notice, EPA may propose revocation of certain benomyl tolerances. EPA must receive comments on the May 22 FR notice by June 22, 2000. Comments must reference docket number OPP-66287. The notice is available on EPA's web site at www.epa.gov/fedrgstr. (Brown)

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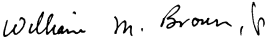
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Where trade names are used, no discrimination is intended, and no endorsement by the Cooperative Extension Service is implied.

Sincerely,


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