Virus diseases active in Nebraska’s wheat

Wheat soil-borne mosaic virus, wheat spindle streak mosaic virus and wheat streak mosaic virus were confirmed in wheat samples from south central and southwestern Nebraska. This is not surprising since the weather pattern of alternating cool and wet and warm and dry periods have been ideal for virus development.

The disease cycle for wheat spindle streak mosaic is very similar to that of wheat soil-borne mosaic. Both are transmitted in the fall to wheat in association with the soil-borne fungus *Polymyxa graminis*. Wheat spindle streak mosaic has the lowest temperature requirement of the cereal viruses; however, symptoms often overlap with those of soil-borne wheat mosaic. As temperatures consistently remain warmer, symptoms of both soil-borne mosaic and spindle streak mosaic will be suppressed.

Distinguishing the two virus diseases in the field can be difficult. Younger leaves of spindle streak-infected plants have distinct light green to yellow, spindle-shaped streaks running parallel to leaf veination. With time the spindle-shaped lesions become necrotic. Symptoms of soil-borne mosaic appear as a yellowish-green mosaic, mottle and streaking. Infected plants may be stunted. The pattern of symptoms is often more intense in terrace channels or lower areas within fields. When mosaic symptoms occur in early spring on wheat varieties known to be resistant to soil-borne wheat mosaic, the cause is most likely wheat spindle streak mosaic.

Economic importance of spindle streak mosaic and soil-borne mosaic varies with the degree of susceptibility of the variety and how early infection occurred last fall. There is no cure once plants become infected, so prevention is important with (Continued on page 43)

Planting time options for chinch bugs and greenbugs

Placing time insecticide applications or planting insecticide treated sorghum seed (Gaucha) are effective means of controlling many early season sorghum insect pests. They control seed feeding pests, seedling greenbug infestations, and can help reduce chinch bug damage, if damaging populations develop; however, if such populations don’t occur, they become unnecessary production expenses. Since most planting time treatments are applied before a problem can be identified, planting time treatments are not recommended in most situations.

Exceptions are when sorghum is planted next to wheat during chinch bug outbreak years, and in fields with a history of severe wireworm damage. Although planting time treatments are effective in controlling wireworms and early season greenbugs, our studies indicate that seedling greenbug damage is seldom. Treatments are not likely to be cost effective except in heavy wireworm infestations (greater than 20% stand reduction).

Chinch bugs in 1999

As the time for planting grain sorghum nears, many growers in the High Plains states are considering planting it into drought damaged and winter killed wheat fields. Dry weather, poor wheat stands, and planting sorghum into wheat stubble with volunteer wheat can contribute to increased damage from chinch bugs. Chinch bug numbers and damage have been increasing the past three years and we expect some localized, heavy (Continued on page 41)
Crop report

Winter wheat condition rated above year ago levels with 1% very poor, 1% poor, 21% fair, 68% good and 9% excellent. Oats seeding was 55% complete, well ahead of 19% last year and the average at 38%. Seeding was near completion in many southern counties. Oats emerged was at 14%, compared to 7% last year.

Nebraska Agricultural Statistics

Daconil 2787 phased out of home lawn use

Zeneca has removed the home lawn application site for all Daconil 2787 fungicide products. This includes both professional-use products and homeowner-use products purchased through the garden center.

Existing Daconil 2787 products with home lawns on the label can continue to be used on home lawns until the product is used up. All newly-labeled Daconil 2787 will not include home lawns.

John E. Watkins
Extension Plant Pathologist

Precipitation

The map shows precipitation amounts from April 5 to April 11.

Calendar

- Continue scouting for army cutworms in wheat and alfalfa, although the brunt of the infestation season is largely over.
- Continue scouting for pale western cutworms as they are likely to be just about big enough to have an impact on wheat — if there are any out there.
- Scout for army cutworms in emerging sugar beets over the next few weeks.
Chinch bugs, greenbugs (Continued from page 39)

Chinch bugs, greenbugs damage this year, particularly in sorghum planted next to wheat. In some fields, particularly in Saline County, the use of Gaucho treated seed or applying Furadan 4F at planting to the outer rows of sorghum next to wheat could be beneficial.

The best recommendation to reduce damage from chinch bugs is to avoid planting sorghum next to wheat. When planting sorghum directly into wheat, make sure the wheat is completely destroyed before planting. The longer the interval between destruction of the wheat and planting of the sorghum, the less chance there is for chinch bug survival and damage. Consult the University of Nebraska Herbicide Guide, Extension EC-130, for herbicide recommendations for destroying volunteer wheat.

Planting time insecticides are effective on light to moderate populations of chinch bugs. Gaucho treated seed and furrow applications of Furadan 4F (2.5 oz/1000' of row) have provided comparable control of chinch bugs in several research trials. Nothing has worked well under heavy chinch bug pressure. In fields planted with Gaucho-treated seed, the plant-back interval (length of time before you can replant in the field) for corn and soybeans has been reduced to 30 days. Previously the plant-back interval was 12 months, which essentially eliminated planting corn or soybeans the year after using Gaucho-treated seed. For more information on chinch bugs, refer to University of Nebraska NebGuide, Chinch Bug Management (G86-806).

Greenbugs in 1999

In our studies the past two years, Biotype I has been the predominate greenbug in Nebraska. Biotype I resistant sorghum hybrids have been highly effective in reducing greenbug damage. Biotype E resistant hybrids have not been consistently effective in reducing greenbug damage for several years. Many factors are involved in selecting the best sorghum hybrids for your fields.

If well adapted Biotype I resistant sorghum hybrids are available for your area, carefully consider whether they can fit into your overall needs. Greenbug populations are sporadic and it is not possible to predict when damaging populations will occur. Well adapted, high yielding, greenbug resistant hybrids provide an effective, low cost means to reduce damage from a sporadic pest like the greenbug. Greenbug growth and reproduction is slower, and it takes more greenbugs to damage greenbug resistant hybrids. This allows more time for beneficial insects such as lady beetles, lacewings, and parasitic wasps to control greenbugs before economic damage occurs.

Occasionally greenbugs damage seedling sorghum in Nebraska, especially susceptible hybrids. Seedling sorghum infestations are often eliminated by adverse weather conditions such as rain and hot dry winds. If greenbugs migrate into sorghum fields early and weather conditions do not eliminate them, populations can develop quickly and severe damage may result. Sorghum fields should be examined at five- to seven-day intervals to detect greenbugs early to better prevent heavy damage. The treatment threshold for seedling sorghum is: greenbug colonies present on 10-20% of the plants AND yellowing or spotting of leaves is visible because of greenbug feeding. This threshold works for both greenbug resistant and susceptible sorghum because greenbug resistant sorghum can withstand more feeding before damage occurs. Although it is tempting to go ahead and treat with an insecticide when greenbugs are first detected, wait until the greenbug population and damage reaches the treatment threshold before applying an insecticide. A thundershower or hot wind may eliminate the greenbug (Continued on page 42)
Greenbugs
(Continued from page 41)

problem before treatment is necessary.

Applying an insecticide at planting is another alternative for control of seedling infestations. We do not highly recommend planting time insecticide treatments because seedling greenbug populations do not occur each year and continued use of insecticides often leads to development of insecticide resistance. From a control standpoint, registered granular (Counter, Di-Syston, and Thimet) and liquid (Furadan 4F) planting time insecticides, and Gaucho-treated seed provide effective control of greenbugs on seedling sorghum. In our tests over the past four years, Gaucho has provided 30-55 days of residual control of greenbugs with other insecticides providing slightly shorter residual activity. None of the planting time treatments provided protection from late season infestations of greenbugs. In years like 1997, when we did not have our normal late season migration of greenbugs into fields, early season control of greenbugs by Gaucho and some planting time insecticides resulted in fields that were relatively free of greenbugs throughout most of the season. For more information on greenbug management refer to University of Nebraska NebGuide, Management of Greenbugs in Sorghum (G87-838) available from your local cooperative Extension office.

For more information on insecticides and management of sorghum pests, refer to the Insect Management Guide for Sorghum on the University of Nebraska, Department of Entomology Home page (http://ianrwww.unl.edu/ianr/entomol/pmguides/sorguide.htm) or contact Z B Mayo, Dept. of Entomology, 202 PL, University of Nebraska, Lincoln, NE 68583-0816, Phone (402) 472-8703.

Z B Mayo
Extension Entomologist

Detecting alfalfa weevils

Base 48 growing degree days accumulated Jan. 1-April 12. Spring hatching weevil larvae usually cause noticeable damage at about 300-375 growing degree days. Producers in southern Nebraska should be scouting now.

Field scout training set for mid May at 2 sites

Integrated pest management field scout training will be offered in two central Nebraska locations in 1999. One program will be held May 12 in the Buffalo County Extension Complex at the county fairgrounds in Kearney. The second program will be held May 13 in the auditorium of the University of Nebraska West Central Research and Extension Center south of North Platte.

Registration begins at 8 a.m. both days.

These meetings will provide an opportunity to introduce new summer field scouts to various pest situations as well as refine the skills of veteran scouts. Classroom and hands-on instruction in identification of weed, insect and disease pests found in field corn and soybeans will be covered. Recognition of agronomic problems will be detailed and irrigation scheduling will be demonstrated.

There will be a $15 per person registration fee, which will cover the cost for speakers and a noon meal. Field Scout Handbooks will be available at a cost of $35, which includes handling and sales tax. This meeting will qualify for CCA continuing education credits in each of the listed areas.

Pre-registration is requested to plan for the meal and to order handbooks. Please contact Ron Seymour at the University of Nebraska West Central Research and Extension Center, Rt. 4, Box 46A, North Platte, Ne. 69101 or (308)532-3611, Ext. 160.

Ron Seymour
Extension IPM Assistant
Zeneca’s Quadris fungicide labeled for wheat, potatoes

Zeneca’s Quadris 2.08 SC has been labeled for wheat and potatoes. Quadris is a broad spectrum, preventive fungicide with some systemic activity. The active ingredient is azorystrobin which is a new family of fungicides.

For wheat it is active against leaf, stem and stripe rusts; Septoria leaf and glume blotches; tan spot and powdery mildew. Application window is from immediately after jointing (Feekes 6 or Zadok’s 31) up to late head emergence (Feekes 10.5 or Zadok’s 59). Applications can be made by ground, air or chemigation. A crop oil concentrate adjuvant added at 1.0% v/v will optimize efficacy. Do not apply Quadris within 14 days of harvest for hay or 45 days of harvest for grain and straw.

On potatoes Quadris is labeled for control of early and late blight diseases. For resistance management apply Quadris in a one to one alternation program with fungicides that have a different mode of action, i.e. Bravo. Make applications on a five- to seven-day schedule. Do not make more than six applications of Quadris, and do not apply Quadris within 14 days of harvest.

Quadris is also labeled for diseases of tomato, cucurbit vine crops and Christmas trees.

John E. Watkins
Extension Plant Pathologist

Plant and Pest Diagnostic Clinic Update

Wheat diseases diagnosed in the last two weeks were wheat streak mosaic, soilborne wheat mosaic, wheat spindle streak virus, and crown and root rot.

Loren J. Giesler, Plant and Pest Diagnostic Clinic Coordinator

Follow pesticide label directions

A producer can quickly turn a beautiful spring day of field work into a serious situation of pesticide poisoning if he or she doesn’t wear appropriate protective clothing and equipment.

Potential risks can be easily avoided by proper chemical use and disposal, said Larry Schulze, University of Nebraska pesticide coordinator. Schulze organizes and coordinates pesticide applicator training with NU Cooperative Extension educators and specialists for farmers and commercial applicators in Nebraska.

The simplest way to avoid pesticide poisoning is to read and follow label directions, and correctly use personal protective equipment, Schulze said. Poisoning signs include flu-like symptoms such as vomiting, sweating, headache, dizziness or pin-point pupils.

"There are potential risks associated with pesticide use. However, that risk is manageable, and the pesticide applicator is the manager," Schulze said. Improper pesticide handling can expose unknowing children, adults and animals to chemicals.

The Nebraska Department of Agriculture investigates and documents complaints against improperly handled pesticides. When violations do occur, offenders may be fined and must change their practices to follow NDA approval.

Recent documented NDA violations commonly reflect illegal disposal of pesticides or their containers. In one case, a small-town pesticide applicator rinsed out tanks and equipment on a dirt road. A dog drank that rinse water and died later that day. NDA’s investigation found significant levels of herbicides and the insecticide methyl parathion on the dirt road. The company the applicator worked for was fined $2,000 for improper disposal and was required to construct a load-out pad for pesticide activities.

Pesticides should be stored in a place that is locked, has a sealed floor and is adequately lit so labels may be easily read. Chemical resistant gloves, goggles and an appropriate apron should be worn while working with chemicals.

Pesticides should be stored away from animal feed, and the applicator shouldn’t mix chemicals near other people or animals, he added.

Courtesy of News and Publications, NU Institute of Agriculture and Natural Resources

Wheat diseases

These two diseases. Using resistant or tolerant varieties and planting at the proper time reduce the threat of losses from either virus. Since both occur in the same areas, growers with virus symptoms this year may want to have the virus identified in order to better plan for next year. Planting a soil-borne mosaic-resistant variety into a field infested with spindle streak mosaic doesn’t solve the problem.

As we move into late April and early May, symptoms of wheat streak mosaic, barley yellow dwarf and High Plains virus will become more evident. Wheat streak mosaic and High Plains viruses often occur together in affected fields. They cause severe yellowing, stunting, rosetting and even plant death. Plants infected with barley yellow dwarf virus show a bright yellowing of the upper halves of leaves. This is particularly evident when the wheat is in the boot to heading stage.
Introducing

Woolly Cupgrass – A New Class of Weed

Ten years ago, mentioning woolly cupgrass would not draw much of a response. Most people had not heard of this aggressive weed. Woolly cupgrass (Eriochloa villosa) was first noticed in small escape patches in soybeans after Prowl or Treflan. In 1992 Iowa producers began seeing infestations that warranted concern — 5% of the acres were infested with this grass. In 1995, 25% of the acres were infested, and this infestation is moving west. Present treatments have run as high as $40/acre to control this species.

Identification

Woolly cupgrass identification should be made when the grass is a small seedling 2-3” in height. At this stage it may resemble foxtail but closer examination will easily separate these two. The leaves of cupgrass are much broader than most annual grasses and usually one edge displays a crinkled look (Figure 1). Seed is very large, four to five times the size of foxtail, and is cream colored. The ligule is hairy with pubescence on the leaf and sheath although this pubescence may be lacking. Adult plants can be three to five feet tall with the inflorescence a panicle of racemes (Figure 2). Spikelets are two-flowered, lacking awns, with the rachis covered with soft hair.

Biology

Woolly cupgrass is an annual grass species that is a prolific seed producer. Mature plants can produce up to 150,000 seeds with about 90% viability. This is one reason woolly cupgrass is such a competitive threat. Cupgrass also has a very wide germination window with studies showing germination from 59°F–100°F. This is why woolly cupgrass can germinate ahead of foxtail and continue throughout the growing season. Woolly cupgrass seedlings initiate tillering at the two- or three-leaf stage and produce many tillers. This allows cupgrass to produce a significantly greater amount of biomass than foxtail, allowing the plant to compete better throughout the season.

Last year Brady Kappler, extension educator in Cedar County, began warning area producers to watch for this weed species. Understanding its potential to spread in eastern Nebraska, his warning is warranted. Because weed management costs have more than doubled for infested fields, prevention is crucial.

Management

While prevention should be the primary management strategy, this will do little good if the infestation is present. Keep in mind that the presence of woolly cupgrass warrants extraordinary measures. The use of integrated weed management is crucial to the success of woolly cupgrass control.

In corn, several herbicides can aid with control of cupgrass. A single preemergence application alone will not be sufficient since cupgrass will germinate late into the season. Several management scenarios that have proven successful are Surpass/Harness, Eradicane, DoublePlay or Balance followed by Accent Gold, Liberty, Lightning, or Poast Plus, assuming the correct transgenic crop is used for each postemergent herbicide. These herbicides provide 88–95% control of woolly cupgrass. In soybeans, Prowl followed by Pursuit and a grass herbicide such as Fusion,
Plan your weed management strategy to avoid developing herbicide resistance in the future

By now we know that even our most well developed technology will not solve all our weed management problems of the future. In fact, it may be the misuse of this technology that creates some of our most severe weed problems. Consider the case of atrazine. When atrazine was developed, it was seen as a technologically advanced herbicide with a very wide weed control spectrum that was inexpensive. So how did we capitalize on this technology? We used as much of it as we could as often as we could, year after year. Weed response was excellent for a while.

There is nothing magical about the development of herbicide resistant weed populations. For the most part, a great number of herbicide resistant weeds already exist naturally in the field. We refer to this phenomena as herbicide tolerance. Tolerance is the naturally occurring ability of a species to resist effects from a herbicide. For example, velvetleaf is tolerant to Poast herbicide. There is also the chance that we create resistance through our management practices. Resistance, by definition, is the decrease in susceptibility of a weed population to a herbicide as the result of repeated exposure to the herbicide. In the case of atrazine, our model example, repeated use year after year resulted in a number of species including kochia, lambsquarters, pigweed and waterhemp becoming resistant to the triazine mode of action. Another example would be resistance located in the ALS-enzyme of waterhemp resulting from repeated use of Pursuit and other herbicides with similar modes of action.

We realize the greatest factor combating resistant weed populations is our management. This refers to all practices involved in the cropping scenario throughout the year. First, the importance of herbicide rotation can not be stressed enough. Rotating mode of action will go a long way in combating resistance and will also result in better weed management overall. Rotation partners should have different modes of action.

When tank mixing, it is important that the tank mix partner have good activity on similar weeds. For example, if we tank mix herbicide X with herbicideY but herbicide Y has no effect on several species only slightly vulnerable to herbicide X, our mixture has done little good. Another practice that will reduce resistance is using herbicides with shorter residual. For example, when using a long residual herbicide such as atrazine, weed species such as waterhemp that have a late-extended germination window are subjected to selection for the full season. This exposure may allow the weed to go to seed. The other extreme is Roundup, which has no residual activity. Weeds that germinate after a Roundup application will grow and reproduce unaffected by the herbicide.

Other practices to combat weed resistance include incorporating integrated weed management practices and not allowing weed escapes to go to seed. By using multiple practices such as cultivation, crop rotation, herbicides and good, sound management even those weed species with some tolerance to our most technologically advanced herbicides can be controlled. One of the biggest questions continues to be Roundup resistance. It seems we may have seen some tolerance to Roundup in 1998, although there are many other factors that should be verified before such a claim is made. It is more likely that our immediate concerns should focus on species shift rather than species resistance.

Building an integrated weed management program including Roundup can provide a very sound management system. Growers need to remember that resistance is very real. Our advanced technology can become our worst enemy when used improperly.

Jeff Rawlinson
Extension Weed Science
Alex Martin
Extension Weed Specialist

Wooly cupgrass

(Continued from page 44)

Poast or Select will provide over 90% control. Soybeans are the best shot at total woolly cupgrass control. Roundup alone has not proven to effectively control woolly cupgrass.

The main aspect of woolly cupgrass management is to rotate herbicides and reduce chances for resistance. With few herbicides providing effective control, causing resistance to one or more modes of action would not be good. Cultivation and rotary hoeing are also very important tools to reduce this likelihood. Regardless of extreme measures used, producers should realize that once integrated weed management is implemented, control should be achieved within two growing seasons.

Jeff Rawlinson
Extension Weed Science
Brady Kappler
Extension Educator Cedar County
Alex Martin

Coming soon:
Focus on soybeans

April 16, 1999  CROP WATCH  45
Benefits of insect-pollinated crops

Crops are either self-fertile and set fruit or seed with their own pollen (self-pollination), or self-infertile, and need to receive pollen from other plants of the same species (cross-pollination). Moreover, some self-fertile species produce more fruit, or seeds of better quality, when cross-pollinated than when self-pollinated. Various devices favor cross-pollination to self-pollination, even when the latter can occur.

Wind is the principal pollination agent for corn, wheat, grasses, and a few other species. Most other agricultural and horticultural crops have conspicuous, colored and scented flowers that are adapted for insect pollination. The role of the insect pollinator will depend on whether the plant species is self-fertile and partially self-pollinating, or self-fertile and not self-pollinating, or self-infertile. Some crops give no yield increase or only a modest yield increase when pollinated by insects. With others, yield greatly increase, and with others, there is little or no fruit without insect pollination. When pollination is inadequate, small misshapen fruits may form. Pollination also may increase the oil content of some seeds (e.g. sunflowers).

Many insect-pollinated crops offer a higher return per acre than crops that do not require insect pollination. When growing crops that benefit from insect pollination, inadequate pollination can limit production and profitability. Natural populations of pollinators are usually inadequate to meet the pollination requirements for optimum yields. Growers seeking information on the pollination requirements of crops will find an excellent resource on the Internet at: http://gears.tucson.ars.ag.gov/book/index.html. The site contains S.E. McGregor’s classic reference on pollination, Insect Pollination of Cultivated Crop Plants, Agriculture Handbook 496. The site has information on the pollination requirements of most of the crops grown in the United States. It also provides an introduction to pollination biology and to the insect species that are managed for pollinating crops.

Information on training opportunities in beekeeping can be found on the Department of Entomology’s web site http://ianrwww.unl.edu/ianr/entomol/beekpg/sched99.htm.

Marion D. Ellis
Extension Apiculture Specialist

New plant guide more inclusive

A new book co-published by the U.S. Department of Agriculture covers 10,000 of the world’s economically important plants, more than three times the number of plants covered in the last edition.


World Economic Plants was published under a cooperative research and development agreement between ARS and CRC Press of Boca Raton, Fla. The book lists accepted scientific names, important synonyms and common names, economic uses and geographical distribution. Cost is $125. Contact CRC press or visit their web site at http://www.crcpress.com/catalog/2119.htm for more information.

- Need a quick guide for corn insect pests?
- Interested in improving communication in your family?
- Looking for cost estimates for your farm budget?

These and 1,000s of other topics are addressed in University of Nebraska Cooperative Extension NebGuides, NebFacts and Extension Circulars. These publications are available from your local Cooperative Extension office or on the Web at http://www.ianr.unl.edu/pubs/index.htm