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Pest Alert

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SUGAR BEET FUNGICIDE UPDATE

Quadris Flowable Fungicide has received a Section 18 Emergency Exemption (EPA Reg. No. 10182-415) for the control of Rhizoctonia Root & Crown Rot on Sugar Beets in Colorado; effective May 17,2000. The product can be applied at the rate of 0.39 - 0.58 fl. oz. of product per 1000 foot of row according to Zeneca Ag Products. Apply Quadris in a 5 - 7 inch band no earlier than the 4 true leaf stage of sugar beet development, or around the time of cultivation for weed control. Applications must be made using ground equipment only, and use sufficient water volume for adequate coverage. It can be tank mixed with herbicides; do not tank mix with insecticides.

Under high disease pressure, a second application may be made prior to, or at, row closure. For Rhizoctonia control, a maximum of 2 applications of Quadris Flowable may be made per crop per acre per year. Quadris should be integrated into an overall disease management strategy for each field: plant the least susceptible variety, use the optimum plant population, and follow proper fertilization, crop rotations and water management practices. Consult your local agricultural authorities for additional IPM strategies established for your area. (Schwartz)

WHEAT DISEASE UPDATE

Ron Meyer (CSU Cooperative Extension, Burlington) reports that wheat in the Burlington area is pretty dry. Ron reports some instances of barley yellow dwarf, minor leaf rust (not severe because it is so dry) and fairly wide spread occurrences of wheat streak mosaic virus. How much of the wheat streak mosaic is actually High Plains virus or a combination, we do not really know yet.

The main problems appear to be dryness and cold damage that developed after the low temperatures on the 12th. Some areas are reported to have gotten down to 24 and many had several hours at 28 or below. With wheat already stressed, it is more than likely we will see some significant damage and yield loss.

Vidal Velasco surveyed the area from Springfield to Yuma last week and reported that there is a lot of yellow wheat but again, the major problem appears to be the lack of moisture. Additionally, he reports very little leaf rust development.

Virus infections in wheat have a wide range of effects, from those showing little to no symptoms (latent) to many that are killers. Depending on the virus, symptoms in wheat can range from discoloration, yellow to purple/reddish, stunting, curling, mosaics and necrosis. It is also possible to find more than one virus in the same plant and thus, a more complex symptom reaction can develop.

As I mentioned in the last issue, viruses in wheat can be spread by aphids (i.e., barley yellow dwarf virus), mites (i.e., wheat streak mosaic virus, Agropyron mosaic virus and High Plains Virus and even fungi (soil-borne mosaic virus)). The level of infection generally depends on the presence and activity of the vectors. So far, we have seen all of these this spring.

On the High Plains it is worth noting that where we are seeing higher instances of wheat streak mosaic (and High Plains disease) it is, as expected, in association with volunteer wheat fields. But also we are seeing what we believe to be an increase in occurrence next to and associated with the increase in dryland corn production. Also, in parts of the state where some growers plant wheat earlier for grazing, the development of wheat streak mosaic/High Plains disease and its wheat curl mite vector are increased. As most of you know, the wheat streak mosaic virus has to have a living host, either in the wheat curl mite vector or the wheat host. Other hosts are barley, corn, rye, oats and a number of grasses. Sorghum has been shown to be a host as well, but occurrence under natural conditions is fairly infrequent.

The following table provides some guidelines to differentiate wheat streak mosaic and High Plains disease from barley yellow dwarf, the viruses of greatest importance in Colorado wheat.

	Wheat Streak Mosaic/ High Plains Disease	**Barley Yellow Dwarf**
WHEN SYMPTOMS APPEAR	4-6 weeks after spring growth begins. On volunteer in fall.	6-8 weeks after spring growth begins
PATTERN IN FIELD	Most intense along edge near volunteer wheat and diminishing with distance. Spread in the direction of prevailing wind.	Random circular spots of 2-6 feet in diameter
STUNTING	Severe and persists to maturity	Some - often most severe in center of spots
LEAF MOTTLING AND COLOR	Bright yellow with streaked pattern mosaic most prominent on upper leaves	Leaf tips bright yellow or reddish-purple. Flag leaf symptoms most prominent.
OTHER SYMPTOMS	Prostrate tillers. Curling and trapping of leaves. Wilted, poor roots.	Increased winterkill. Blackened glumes. Poor roots.
TEMPERATURE EFFECTS	Symptoms increase as weather warms.	Cool - more reddish purple Warm - more yellow
VECTORS	Wheat curl mite.	Several aphids. Not Russian wheat aphid.
SOURCE OF VIRUS	Early volunteer wheat, corn and some grasses	All small grains, corn and many native and introduced grasses
CONDITIONS FAVORING DISEASE	Early volunteer from hail at harvest. Volunteer left until after seeded wheat emerges. Warm fall.	Many aphids in fall and a cool spring. Warm fall.
WHERE SERIOUS	Most severe in Eastern Colorado but confirmed and becoming more severe on western slope.	Erratic, widespread on both sides of mountains.
CONTROL	Destroy volunteer wheat and delay planting.	Late planting.

With the increase in dryland corn growing there is a potential for an increase in viruses in the winter wheat crop. A problem arises in that while many corn varieties do not show wheat streak mosaic or High Plains disease symptoms, those corn varieties can still serve as reservoirs for the viruses and the wheat curl mite vector. We will only know with time if this is going to be a major problem or if the wheat streak resistance available in some wheat varieties will be sufficient to manage this potential problem as well as the High Plains disease component.

With heading underway where there is some Cephalosporium stripe and root rot, some whitehead development will be observed in fields. The whitehead key that follows was originally developed by Bill Willis in Kansas. I adapted it to help to identify problems in Colorado.

WHITE-HEAD DIAGNOSTIC KEY

1. Awn tips white and sometimes bent ..... Frost or Freeze

2. Part of the head dead: neck still green -

   a. Dead parts white to gray ..... Frost or Freeze
   b. Dead parts (sometimes-whole head) pink ..... Scab

3. Head and neck dead down to the top node with the rest of plant green.

   Pull head out and examine for chewing or maggots
   above the top node ..... Stem Maggot

4. Single tillers with white heads -

   a. Lodging Not Common.

      1) vascular discoloration evident in
         stripe in leaves and/or nodes ..... Cephalosporium
      2) lens shaped lesions on the lower
         internode ..... Sharp Eyespot

   b. Lodging Common.

      1) small pupa under leaf sheath above
         node ..... Hessian Fly
      2) grayish lesion on lower internode with the stem collapsed,
         bent or broken in the middle of the lesion ……. Strawbreaker

5. All tillers die at same time-no lodging.

   a. Stem pulls out easily. Roots, crown are black,
      subcrown internode sometimes shiny black also ……. Take-all

   b. Does not pull out easily. Crown and
      lower internode medium brown ..... Common Root Rot

6. Plant dying, leaves rolling and/or purpling but none of above.

   Poor Roots, Drought, Drowning, Hot Winds or Russian Wheat Aphid

(Brown)

DIAGNOSING FROST INJURY

As noted above, we are expecting to see wheat damage due to low temperatures. Bob Bowden (Kansas State University Extension Plant Pathologist) in the last Kansas newsletter, had a short note on diagnosing low temperature (frost) damage. He points out that depending on temperature and timing, frost injury can take many different forms.

Damage to the lower stem is most common. Bob advises to look for split stems and brown lesions on nodes or internodes. Also cut the stem open and check for internal discoloration. Stem damage can lead to blind tillers, premature tiller death, and ultimately, lodging.

Damage also occurs to heads. When frost occurs during late jointing, small, white, wispy heads or portions of heads will frequently develop. If frost occurs during the late boot stage, the result is often development of sterile yellow heads. If frost occurs during flowering, the result may be in normal looking green heads, but they do not fill because pollination is disrupted. (Brown)

WATCH FOR SPOTTED WILT IN GREENHOUSES

Spotted wilt disease of ornamentals and vegetables is a virus disease that can be found occurring in some Colorado greenhouses. Nationally, this virus has been a major production problem over the last few years in many areas. It is now known that there are actually 2 viruses named after the first plant they were found in. Both have wide host ranges. Tomato spotted wilt (TSWV) and impatiens necrotic spot (INSV also called TSWVI, strain in the past) go to a wide range of greenhouse plants including alstroemeria, begonia, chrysanthemum, cyclamen, geranium, gloxinia and impatiens. Many vegetables such as lettuce, tomato and pepper are also affected. Dr. Schwartz and I have seen whole commercial fields of peppers and tomatoes destroyed by spotted wilt in the past, when symptomless transplant sets were used.

The viruses are carried by species of thrips. The most common is the western flower thrips (*Frankliniella occidentalis*). While infection is most common by thrips, the virus is easily and frequently transmitted in cuttings and other vegetative plant material during propagation.

Symptoms vary depending on host, environmental conditions and which virus is attacking the plant. There can be necrotic spots, streaking, ring spots, stem purpling and wilting (see illustrations). Diagnosis based on symptoms alone is difficult and a laboratory serological test is the most dependable. Both the CSU and the JEFFCO clinics can do these tests.

Fig. 1. INSV symptoms on impatiens.

Fig. 2. TSWV on tomato fruit.

Sanitation in the greenhouse and elimination of the vector are the only means of controlling the viruses. See Cooperative Extension fact sheet no. 2.947, ***Greenhouse Plant Viruses*** by Laura Pottorff and Steve Newman for more detail. (Brown)

CONTRIBUTORS

K. George Beck, Extension Weed Specialist, Perennial and Range (970) 491-7568; gbeck@lamar.colostate.edu
William M. Brown, Extension Plant Pathologist, IPM and General (970) 491-6470; wbrown@lamar.colostate.edu
Whitney S. Cranshaw, Extension Entomologist, Urban and Horticulture (970) 491-6781; wcransha@ceres.agsci.colostate.edu
Sandra McDonald, Extension Specialist, Environmental and Pesticide Education (970) 491-6027; smcdonal@lamar.colostate.edu
Scott J. Nissen, Extension Weed Specialist, Row Crops (970) 491-3489; snissen@lamar.colostate.edu
Frank B. Peairs, Extension Entomologist, Field Crops (970) 491-5945; fbpeairs@lamar.colostate.edu
Howard F. Schwartz, Extension Plant Pathologist, Row and Vegetable Crops (970) 491-6987; hfspp@lamar.colostate.edu
Philip H. Westra, Extension Weed Specialist, Row Crops (970) 491-5219; pwestra@ceres.agsci.colostate.edu

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Sincerely,

William M. Brown, Jr.
Extension Plant Pathologist