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Pest Alert

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JULY 6 VEGNET REPORT

During the last week, temperatures averaged in the mid 80s to lower 90s at most sites in the region. During the last week, rainfall was less than 0.25 inches on the average in most of Colorado and Nebraska. A few sites received more rain last week; many northeastern Colorado sites received more than 1.70 inches, and the Kansas sites received 1.46 to 2.73 inches. The upcoming week is forecaste at above average moisture and average temperature at most sites for this time of the year.

Crops should be scouted at least once a week for early evidence of pests. Check with your local consultants and other experts on crop status and the initiation of disease protection strategies when either disease is confirmed in the region and/or a disease threat does exist.

DRY BEAN Pests:

As of July 6, the dry bean crop continues with the rapid vegetative to early flowering phases in the region and there are no reports of rust problems. Some fields have been hit by localized storm damage from hail, wind, and wind-blown soil; and many are beginning to show light to severe outbreaks of bacterial brown spot. Generally, it is best to wait a few days to allow damaged plants and structures to recover and initiate new growth from surviving nodes/buds before applying any responsive treatments such as foliar nitrogen and/or copper-based bactericides to reduce bacterial disease development. Research in the region has not shown any consistent response of storm-damaged plants to foliar feed.

Maintain the copper bactericide program on a 7 – 10 day schedule throughout the late vegetative to early pod set phases, especially for light red kidney and yellow beans. Ground-rig applications are preferable until row closure; then rely upon aerial sprays (4 – 5 gal of water/A) or chemigation (less than ¼ in of water/A) until the risk of infection is low due to absence of disease and/or persistent hot, dry conditions

A survey throughout eastern and southern Colorado in mid June, found ample evidence of volunteer beans in old bean ground planted to wheat or corn, but no evidence of overwintered rust infection. The lack of rust on volunteers may be attributed to a number of factors including low disease pressure in 1998 at harvest, and increasing acreage planted to rust-resistant varieties of pintos.

On ground with a history of white mold planted to susceptible, vine-type pintos or great northerns, consider application of a white mold fungicide (Topsin, Benomyl) at 100% to full bloom to protect blossoms from becoming colonized by the fungus and initiating white mold infection after row closure.

ONION Pests:

As of July 6, most transplanted onions continue to size up nicely. The recent cool, wet spell has initiated some scattered outbreaks of downy mildew and bacterial diseases like soft rot in the Front Range area, so aggressively scout fields at least twice a week to detect and/or confirm presence of the diseases in your fields or in the area. Once confirmed, fungicides like the EBDCs (Maneb, Mancozeb, Dithane, Penncozeb) or Ridomil tank-mixes have been extremely effective, especially when a non-ionic surfactant is added in sufficient gallonage. Rate fungicide chemistry every other application.

The disease model (PRI = 300, RH = > 95%) suggests that purple blotch may occur in some regions in transplanted fields, and now possibly in some seeded fields as well. Continue to scout fields at least once, and preferably twice, a week for early signs of disease in the field or region. Consider application of protectant fungicides including the EBDCs, coppers, Bravo and Rovral in high gallonage plus adjuvant for good coverage on a 7-to-10-day interval. Rotate fungicide chemistry every other application.

Bacterial diseases may become more of a threat to transplanted and now seeded plants as they continue to size up and/or sustain storm damage. Application of copper-based bactericides tank mixed with an EBDC and adjuvant is recommended on a 7-to-10-day interval to reduce background populations of bacterial pathogens which may be moved into fields by wind-blown rain droplets, aerosols, runoff water, implements, etc. Bacterial diseases like Erwinia soft rot and Xanthomonas leaf blight have been confirmed in the Front Range and Rocky Ford areas.

POTATO Pests:

The early blight and late blight disease models have exceeded the threshold for many sites in northeastern Colorado, assuming a May 1 up to May 21 emergence date with hours greater than 80 % relative humidity. Crop development is still quite variable throughout the region as a result of planting dates and earlier delays in emergence due to weather events.

At this point, protectant sprays should be maintained on a 5-to-7-day interval for early blight in most fields and regions of the state; again as affected by your specific emergence date. .Early blight was reported within the last 7 to 10 days in northeastern and Front Range counties of Colorado by cooperators Lanny Martin and Larry Duell & Tim Ridnour – Centennial Ag Supply. There are no reports of late blight in Colorado or neighboring states, but an aggressive early blight fungicide program has been shown to be beneficial against early season infection by late blight as well.

Scouts have brought in numerous samples with suspicious symptoms, but to date none of the tissue has yielded any pathogen of concern. Apparently we are seeing the background effects of various abiotic problems such as scald, heat stress, etc. (Schwartz)

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 dollar spot on many lawns. Much of this is brought on by the very high temperatures that we had the last week and 4th of July holiday. 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 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. Fungicide use 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. But in the future this fungicide may not be available to home owners. 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)

CORN DISEASE UPDATE

With the hot weather we are having, we may see an outbreak of bacterial stalk rot. This is a disease problem that I have only encountered on three prior occasions in Colorado, all in Weld county. Bacterial stalk rot is associated with a corn after-corn-system and the planting of susceptible varieties.

In addition to bacterial stalk rot, growers and agri-professionals should also be to resurgence of Goss's bacterial wilt (we had some cases in the Wiggins area last year) and the possible appearance of Stewart's Blight. These are also hot weather diseases and have for the most part disappeared over the last few years. But with most Colorado growers on a corn-on- corn program, these diseases are always a potential threat.

Bacterial Stalk Rot

Symptoms

Primary symptoms occur in mid-season when plants suddenly lodge. Lodging occurs at the second internode or above. Diseased areas appear tan to dark brown, water-soaked, soft or slimy, and collapsed. Infected tissue produces a foul odor. Affected plants may remain green for several days because the vascular strands remain intact. Bacterial stalk rot occurs in plants both surface and sprinkler-irrigated with river, lake, or impounded water. The tips of the uppermost leaves wilt, followed by a slimy soft rot at the base of the whorl. The decay spreads rapidly downward until the plants collapse. Collapsed, twisted stalks are a good indication of this disease.

Bacterial stalk rot is not common and in the past has been limited to just a few fields in Weld County during very high temperatures.

Disease Cycle

Erwinia chrysanthemi pathovar *zeae* is the bacterial pathogen that causes bacterial stalk rot. The bacterium survives saprophytically on crop residue in the soil and invades corn through stomata, hydathodes or wounds in the leaves or stalks. The organism is also seedborne.

Bacterial stalk rot is most prevalent and destructive in areas with high rainfall, where plants are watered by sprinkler irrigation, and/or on land subject to flooding. The disease is favored by high temperatures (30-35 degrees Celsius) and poor air circulation.

Control

Management of the disease is through a combination of factors that begin with resistant varieties rotation. Anything that enhances air movement and management to avoid flooding. Excessive nitrogen fertilization should also be avoided. There is no chemical control

Goss's Bacterial Wilt and Blight

Goss's wilt is sometimes called leaf freckles and wilt. It was first observed on dent corn in central and eastern Nebraska in 1969. It has since spread north and west in Nebraska, and was found in western

Iowa in 1971 and 1978, eastern Iowa in 1979, several Kansas counties since 1973, and in South Dakota and Colorado since 1974. It is still found in southeastern Wyoming and the Nebraska Panhandle. In Colorado it has been limited so far to the High Plains and Front Range of the state. Last year was the first time in several years that it was a problem. It has not been confirmed in the Arkansas Valley or the West Slope. It has not been reported outside the United States.

Symptoms

Symptoms (wilt and leaf blight) are difficult to differentiate from Stewart's bacterial wilt. Discrete lesions, containing water-soaked streaks, appear parallel to leaf veins. As the streaks enlarge, droplets of bacterial exudate appear on the leaf surface. The droplets soon dry, leaving a crystalline sheen. Lesions may occur on seedlings or older plants and may arise from direct leaf infection or via roots and stalks of young plants. Systemic infection of the roots and crowns was the principal problem last year and the leaf freckle stage was not observed.

Early infections may cause seedlings to wilt, whither, and die. Later infections result in stunting, wilting, or various degrees or leaf blight that appear as gray to light greenish-yellow stripes, occasionally reddish on certain hybrid or inbred lines, with wavy or irregular margins that follow the leaf veins and with or without dark green to black, water-soaked, angular spots (freckles) along the leaf veins. Eventually, the entire leaf dries up.

Systemically infected plants have discolored vascular bundles. A dry or water-soaked to slimy brown rot of the roots and lower stalk may occur, depending on weather and irrigation practices. An orange bacterial exudate is discharged from the vascular bundles when a stalk is cut. Plants can be infected, wilt, and die at any stage of development.

Disease Cycle

The bacterium that causes the disease was first described by Dr. Ann Vidaver at the University of Nebraska as *Corynebacterium nebraskense* in 1974. It is now (1990) known as *Clavibacter michiganensis* subsp. *nebraskensis*.

Bacteria survive in infected corn leaves, stalks, cobs, and ears on or near the soil surface. An additional source of primary inoculum is infected kernels. The bacterium also survives readily in irrigation water. Injury is required for the pathogen to infect. Infection may be direct in leaves or via the roots and stems. Wounding from sand-blasting, hail, severe rainstorms, and wind favors infection.

The pathogen infects dent, sweet, flint, and popcorn varieties and has been isolated from natural infections of green foxtail and shatter cane. Seedlings are more susceptible than older plants. Additional plants found susceptible with artificial inoculation include grain sorghum, eastern gama grass, Sudan grass, sugarcane, and teosinte. Symptoms are a red vein discoloration and long red or small irregularly shaped lesions following the leaf veins.

Control

An integrated approach to managing the disease is essential. There are no chemicals that are labeled for or know to control these bacteria. Management based on the following tactics is effective:

1. resistant dent and sweet corn hybrids are available.
2. crop rotation.
3. selection of seed from non-infested areas.
4. deep-plowing of infected maize hybrids, preferably after harvest.
5. avoid damage and/or stress.

Stewart's Bacterial Wilt

Stewart's bacterial wilt is also called Stewart's leaf blight or maize bacteriosis. It is common in eastern North America, and has been reported in Mexico, Costa Rica, Puerto Rico, Eastern Europe, Italy, USSR, and China. Stewart's bacterial wilt has never been confirmed in Colorado.

Symptoms

Infected sweet corn hybrids wilt rapidly, resembling plants suffering from drought, nutritional deficiency, or insect injury. Leaves show linear, pale green to yellow streaks with irregular or wavy margins that parallel veins and may extend the length of the leaf.

These streaks soon become dry and brown. Infected plants may produce premature, bleached, and dead tassels. Cavities may form in the stalk pith of severely infected plants near the soil line. In such plants, bacteria spread through the vascular system, sometimes passing into the kernels. Masses of bacteria may ooze as yellow, moist beads from cut ends of infected stalks or may "stream" from the cut edges of infected leaf tissue.

Although most field or dent corn is not as susceptible as sweet corn, there are some very susceptible inbred lines and hybrids. Seedlings of very susceptible dent hybrids and lines wither and die.

Leaf symptoms are short-to-long, irregular, pale green to yellow streaks in the leaves. This is known as the leaf-blight or late-infection stage because it generally occurs after tasseling. The streaked areas, which eventually die and become straw-colored, originate from feeding marks of the corn flea beetle. Sometimes entire leaves die and dry up. When leaves die prematurely, yield is reduced and the weakened plants become more susceptible to stalk rots.

Disease Cycle

Erwinia stewartii (now Pantoea stewartii subsp. Stewartii) is the cause of Stewart's blight disease. In sweet corn, the bacteria may be found in roots, stalks, leaf blades and sheaths, tassels, cobs, husks, and kernels. Dent corn kernel infection is rare and occurs only where the disease is severe on very susceptible inbred lines.

The corn flea beetle (*Chaetocnema pulicaria*), both adult and larva of the twelve-spotted cucumber beetle (*Diabrotica undecimpunctata howarti*), toothed flea beetle (*C. denticulata*), as well as larvae of the seed corn maggot (*Hylemya cilicrura*), wheat wire worm (*Agriotes mancus*), and May beetle (*Phyllophaga* sp.) are known to spread *E. stewartii*. Only *C. pulicaria* is known to be important in over wintering and spread of the bacteria. Reports from Illinois, eastern Nebraska and other areas to the east note that the corn flea beetle overwintered in record numbers and the potential for a severe Stewart's wilt season is possible.

Mineral nutrition influences the susceptibility of hybrids to infection by *E. stewartii*. High levels of ammonium N and P increase susceptibility, whereas high Ca and K levels tend to decrease susceptibility. Disease susceptibility is aggravated by high temperatures.

Teosinte and eastern gama grass are also susceptible to *E. Stewartii*. Dent corn generally resists infection better than sweet corn. Root and stalk rots are associated with severe infections of sweet and dent corn.

Control

Management of Stewart's wilt is dependent on several things:

- Resistant hybrids and varieties.
- Early applications of insecticides (e.g. carbaryl) to kill corn flea beetles.
- Rotations.
- Careful nitrogen management.

With continued hot weather these diseases could possibly develop. Continued field scouting is essential. (Brown)

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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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