Cooperative Extension: Colorado State University, Fort Collins, Colorado 80523

Pest Alert

Vol. 17 No. 21 September 20, 2000

The Pest Alert is now found on the World Wide Web at http://www.colostate.edu/programs/pestalert

SEPTEMBER 11 VEGNET REPORT

During the first full week of September - 2000, rainfall totals (inches) varied from 0 to 0.21 inches throughout Colorado, western Nebraska, western Kansas and eastern Wyoming. Temperature averages were in the mid-80s to low 90s at most locations, except at Dove Creek at 79 F. The regional weather forecast predicts average rainfall and above average temperatures for the third week of September.

Bean rust reports came in from many locations in eastern Colorado and western Nebraska last week. However, very few disease reports from other crops and areas have filtered in to VegNet.

Please share sightings of pest problems by calling the CSU VegNet Team at 970-491-6987 (Howard Schwartz), 491-7846 (Mark McMillan), or 491-0256 (Kris Otto).

POTATO

Continue to scout later planted fields for early blight and late blight. Disease pressure from early blight has increased recently on heat stressed plants exposed to cooler and moister conditions in recent weeks.

For late fields, maintain the Early Blight Protection Program throughout the Front Range and northeastern areas of Colorado with protectant fungicides such as the EBDCs (e.g., maneb, mancozeb, penncozeb, dithane, polyram), Quadris, and super tin.

Disease Model: with a May 15 emergence (regrowth) date, the early blight model is averaging 780 - 830 throughout eastern Colorado as of September 10.

The late blight model (threshold of 18, with disease possible in 7 to 14 days) has remained unchanged during the last week, and is still averaging 13 to 27 in the Front Range, 37 at Fort Morgan, and 20 to 36 at northeastern sites (Wray, Yuma), with a May 15 emergence date. There are still no reports of Late Blight in the state as of September 3.

In the San Luis Valley (May 15 emergence date), the early blight model is at 715; and the late blight model is holding steady at still less than 3.

DRY BEAN

During the last week, rust was confirmed on numerous fields of pinto Bill Z and Othello and great northern Beryl throughout eastern Colorado, southwestern Nebraska and northwestern Nebraska. These late infections should not damage the crop if it will be harvested within a couple of weeks, however, the diseased foliage sets the stage for potential epidemics on susceptible varieties planted in the region during 2001. Therefore, adjust combines to reduce loss of bean seed during threshing, and incorporate this year's bean debris to reduce overwintering sites of the fungus.

ONION

Most seeded fields are near or well into harvest. Those that still have 1 to 2 weeks until cropping and harvest may benefit from a continued protectant bactericide/fungicide application (copper + EBDC product such as maneb, mancozeb, dithane, penncozeb) for the bacterial disease complex. There are still no reports of serious bacterial (or foliar fungal) problems in the state. Botrytis blast may appear at this stage of the season as small, whitish, sunken lesions usually beginning near leaf tips and progressing downwards.

Maintain the copper-based bactericide program, tank-mixed with an EBDC product on a 7 to 10 day interval to reduce problems with bacterial diseases and any fungal diseases (Purple Blotch, Downy Mildew, Botrytis Blast) that could develop as the plants continue to develop and mature in the next few weeks. Rovral could be added for enhanced protection against Purple Botch and/or Botrytis if detected. Ridomil/Copper can be added for enhanced protection against Downy Mildew if detected.

If one uses an April 1 emergence date for seeded onions, the Purple Blotch disease model (threshold value of 300) is averaging 675 to 700 in the Front Range and Fort Morgan areas, 550 to 585 in the Arkansas Valley and West Slope areas. Therefore, our onion areas have exceeded the threshold with minimal outbreaks from Purple Blotch; apparently due to inhibition of the fungus by the high temperatures requiring additional modification of the disease-forecast model for future years. With the cooler and moister conditions during the last 2 weeks, we may see a late-season flush of infection with minimal impact upon yield.

Harvest and curing practices should emphasize well-cured, dried tops and bulbs in the field and in storage. This will reduce contamination of exposed neck surfaces, and moisture which is needed by fungal and bacterial pathogens for colonization and infection of onion necks, shoulders and basal plates. Continue curing in the shed with ambient temperature and lots of air movement.

SEPTEMBER 18 VEGNET REPORT

During the second week of September - 2000, rainfall totals (inches) varied from 0 to 0.10 inches throughout Colorado, western Nebraska, western Kansas and eastern Wyoming. The only places with measurable rainfall were Delta, Dove Creek, Grand Junction and Kersey. Temperature averages were in the mid-80s to low 90s at all locations. The regional weather forecast predicts below average to average rainfall at all locations except western Nebraska with above average rainfall. Temperatures will be average in western Nebraska and above average elsewhere for the next week of September.

POTATO

As of September 18, 2000 there were still no reports of late blight in the region. Incorporate harvested debris after harvest to reduce the carryover potential of potato pests that could overwinter and threaten adjacent plantings in 2001.

DRY BEAN

Incorporate harvested debris after harvest to reduce the carryover potential of dry bean pests that could overwinter and threaten adjacent plantings in 2001.

ONION

Incorporate harvested debris after harvest to reduce the carryover potential of onion pests that could overwinter and threaten adjacent plantings in 2001.

Harvest and curing practices should emphasize well-cured, dried tops and bulbs in the field and in storage. This will reduce contamination of exposed neck surfaces, and moisture which is needed by fungal and bacterial pathogens for colonization and infection of onion necks, shoulders and basal plates. Continue curing in the shed with ambient temperature and lots of air movement.

RELEVANCE OF SOIL TESTING TO AGRICULTURE AND THE ENVIRONMENT

Excerpts from CAST Issue Paper, No. 15, June 2000

Soil tests are widely used to predict the probability of crop responses to application of fertilizers, particularly phosphorus (P), potassium (K), and in some instances manganese (Mn), copper (Cu), zinc (Zn) and iron (Fe), and application of lime. Soil-test levels at which no response is obtained are defined as critical soil-test levels that have been determined by greenhouse and field experiments.

The commonly used soil-test extractants for P in the United States are the Bray-1 (Midwest), Mehlich 1 and 3 extractants (southeastern United States), and the Olsen extractant (calcareous soils). The Mehlich 3 extractant is being used by many laboratories because it is suitable for measuring soil-test P over a wide range of soil properties and also is a multi-element extractant.

Because nitrogen (N) can be a very mobile element, most laboratories do not routinely run an N soil test. Nitrogen recommendations are made on the basis of yield goals for a given crop. Where nitrate-leaching potential is at a minimum, the amount of residual nitrate in the soil profile before planting has been related to the need for fertilizer N. In certain humid regions, nitrate levels of the soil have been measured before N side dressing of corn, and the values interpreted as to the amount of fertilizer N to apply.

There is interest at present as to whether soil tests can be used to determine if application of fertilizers and/or waste materials will result in pollution of surface and ground waters. Using soil testing to identify the potential for an environmental impact may have value, but only if a comprehensive approach is taken. Response parameters for other uses of soil testing have not been so well defined, and linkages often remain intuitive or based on the best professional judgment of a team of scientists. Although agronomic responses have been used as surrogates for other secondary effects, including water-quality degradation, this approach is conservative and does not consider adequately the existence of in-field soil processes, multiple loss-pathways, and nutrient retaining processes beyond the field's edge and in streams.

Progress in soil testing is facilitating assessment of soils likely to act as sources of nutrients for surface and ground water. Extractable soil concentrations of nutrients (or of nonessential elements, organics, etc.) are only a few of the many factors, including transport phenomena, management practice effects, and adjacent water sensitivity to an increase in nutrient concentration that must be considered in determination of an appropriate loading rate for nutrient sources potentially affecting water quality.

[Note: Copies of this issue paper are available for $ 3.00 at www.cast-science.org]

GROWING SEASON TRENDS

Excerpts from an article by R. A. Pielke Sr. and N. Doesken,
Atmospheric Science Dept., Colorado State University,
Colorado Climate - Vol. 1, Spring 2000

There is considerable interest in trends in climate across Colorado. Is our climate warming or cooling, for example. We have developed several figures from a recent study for several observation sites in eastern Colorado. We chose sites with the longest set of data to see if long-term trends exist. The concept of statistical testing was used to estimate whether the trends are likely to be real or not.

The results show large variability in time and in space across eastern Colorado. No one station could possibly capture this variability. The trend in growing season length, for example, for the period 1940-1996 lengthened by 43 days according to this analysis, at one of the Agricultural Research Station's sites at the Central Plains Exp. Res. Station near Akron (CPER), while it decreased by two days at Rocky Ford. After the CPER site, the greatest increase in number of growing season days was Fort Collins with 24 days. For their period of record, Wray had an increase of 14 days, while Las Animas increased by 11 days.

We think we understand the lengthening of growing season at Fort Collins since the city has grown substantially, resulting in an urban heat island effect. The reason for the increase at the other locations is unknown. Over the century since 1917, however, the figures show

considerable differences in trends between the sites. There is a tendency, if you clump the stations together, to conclude that growing season has lengthened, but the stations at Akron and Rocky Ford show a shortening of growing season.

What can we conclude from such studies? First, no single station can indicate what the trends are, even in a relatively homogeneous landscape such as eastern Colorado. Secondly, there are significant variations in the trends over time, as well as differences across the region. This variability suggests that the climate in Colorado is strongly influenced by local effects, as well as from any larger-scale climate effects. Finally, trend analyses cannot be used to extrapolate expected climate in the future. If you started in 1940, for example, and tried to predict the climate from 1940-1950 based on the trends prior to 1940, you would be off target! It would be better to assume the variability observed in the previous decades will persist into the future.

Of more concern are climate anomalies that fall outside of the existing climate record. Recent tree core observations from northern Wyoming suggest there was a major drought in that region in the 1700s that lasted for 100 years!

[Note: To subscribe ($ 15.00) to the quarterly issue of *Colorado Climate*, contact the Colorado Climate Center, Atmospheric Science Department, Colorado State University, Fort Collins, CO 80523-1371]

NEW TURF GUIDE AVAILABLE

Ecologically Sound Lawn Care for the Pacific Northwest: ***Findings from the Scientific Literature and Recommendations from Turf Professionals*** is a new guide (report) for integrated turf management in the Pacific Northwest. It is available from Seattle Public Utilities -- Natural Lawn Care Program –on the web at:

http://www.ci.seattle.wa.us/util/lawncare/default.htm
http://www.ci.seattle.wa.us/util/lawncare/LawnReport.htm

The guide (or report) gives an introduction to ecologically based lawn care and reviews the scientific literature that supports the concept. It also contains complete practical recommendations for ecologically sound lawn care in the Pacific Northwest. It also contains an annotated bibliography that reviews information useful to homeowners, landscape professionals, and public resource managers.

I am including an abstract that was prepared by Pam Murray at the University of Nebraska, Center for Grassland Studies, Lincoln, NE.

ABSTRACT: Turfgrass management since 1940 in the U.S. has been characterized by intensive use of synthetic chemicals including water-soluble fertilizers, herbicides, insecticides, and fungicides. Conventional practices also generate solid waste (through removal of grass clippings) and hazardous waste (leftover chemicals), and use large amounts of irrigation water, which may be wasted through over watering or runoff.

A review of current science suggests that these practices may be harmful to human and wildlife health, and also negatively impact the turfgrass ecosystem, contributing to significant declines in populations of beneficial soil organisms, soil acidification and compaction, thatch accumulation, and diminished resistance to diseases. Interviews with turf professionals around the Pacific Northwest region and a review of scientific and technical literature indicate that a proven alternative approach exists. It is based on observation of the entire soil and grass ecosystem, appreciation that turfgrasses are sustained by the activities of soil-dwelling organisms, and understanding that this grass community is a dynamic equilibrium among many plants, invertebrates, and microbial organisms. This equilibrium can then be shaped to support the natural vigor of the grass plant and the beneficial soil organisms, and to minimize pest problems, by application of proper cultural practices.

Recommended practices include: setting realistic expectations for lawn appearance and tolerating a few weeds; proper site selection and soil preparation; using site-adapted grasses; mowing higher; leaving clippings; correcting soil deficiencies; moderate use of natural or slow-release fertilizers; irrigating deeply but infrequently; renovation practices including aeration, over-seeding, and compost top dressing; and use of the integrated pest management (IPM) process.

ECOLOGY OF URBAN SOILS WORKSHOP

Following is an abstract from 'The Ecology of Urban Soils' workshop held in St. Paul. MN, June 11-13, 2000 forwarded by Curt Swift (Coop. Ext., Grand Junction), who participated in the meeting.

Structural Soil: Or How to Grow Trees in Concrete. Nina Bassuk, Urban
Horticulture Institute, Cornell University, Ithaca NY

The major impediment to establishing trees in paved urban areas is the lack of an adequate volume of soil for tree root growth. Soils under pavements are highly compacted to meet load-bearing requirements and engineering standards. This often stops roots from growing, causing them to be contained within a very small useable volume of soil without adequate water, nutrients or oxygen. Subsequently, urban trees with most of their roots under pavement grow poorly and die prematurely. It is estimated that an urban tree in this type of setting lives for an average of only 7- 10 years, where we could expect 50 or more years with better soil conditions.

Those trees that do survive within such pavement designs often interfere with pavement integrity. Older established trees might cause pavement failure when roots grow directly below the pavement and expand with age. Displacement of pavement can create a tripping hazard. As a result, the potential for legal liability compounds expenses associated with pavement structural repairs. Moreover, pavement repairs, which can significantly damage tree roots, often result in tree decline and death.

The problems as outlined above do not necessarily lie with the tree installation but with the material below the pavement in which the tree is expected to grow. New techniques for meeting the often-opposing needs of the tree and engineering standards are needed. One new tool for urban tree establishment is the redesign of the entire pavement profile to meet

the load-bearing requirement for structurally sound pavement installation while encouraging deep root growth away from the pavement surface.

The new pavement substrate, called "structural soil," has been developed and tested so that it can be compacted to meet engineering requirements for paved surfaces, yet possess qualities that allow roots to grow freely, under and away from the pavement, thereby reducing sidewalk heaving from tree roots. "Structural soil" is a designed medium, which can meet or exceed pavement design and installation requirements while remaining root penetrable and supportive of tree growth.

Cornell's Urban Horticulture Institute, which has been testing a series of materials over the past five years, focused on characterizing their engineering as well as horticultural properties. The materials tested are gap-graded gravels, which are made up of crushed stone, clay loam, and a hydrogel-stabilizing agent. The materials can be compacted to meet all relevant pavement design requirements yet allow for sustainable root growth. The new system essentially forms a rigid, load-bearing stone lattice and partially fills the lattice voids with soil. Structural soil provides a continuous base course under pavements while providing a material for tree root growth. This shifts designing away from individual tree pits to an integrated, root penetrable, high strength pavement system.

The technique Dr. Bassuk has developed has specific requirements. Before proceeding with this concept on your own I would suggest you contact Dr. Nina Bassuk at nlb2@cornell.edu (Brown)

GLOBAL IPM AND PEST MANAGEMENT INFORMATION

IPMnet (Integrated Pest Management Network) is a newsletter out of Oregon State University that provides information on any programs, activities, or interests that involve IPM and/or crop pest (insects, weeds, pathogens, nematodes, and vertebrates) management. It is a unique non-commercial source of current global IPM and pest management information that could be useful, and it is free.

IPMnet is:

- a monthly internet-based global IPM and crop pest management information resource.
- seen by nearly 4,000 subscribers in 117 countries
- dedicated to constructively advocating and improving realistic IPM
- environmentally-attuned
- has extensive links to useful IPM information, such as the
  - DATABASE OF IPM RESOURCES
  - RADCLIFFE'S IPM WORLD TEXTBOOK
  - An expertise database and other services.

To subscribe write IPMnetNUZ@bcc.orst.edu.
(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

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

Sincerely,

William M. Brown, Jr.
Extension Plant Pathologist