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Pest Alert

August 11, 2000

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

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AUGUST 7 VEGNET REPORT

During the first week of August - 2000, rainfall totals (inches) varied from 0 to 0.23 in western Colorado, 0.10 in the Arkansas Valley, 0.09 to 0.50 in the Front Range, 0.20 to 1.23 in western Nebraska, 0.20 in western Kansas and 0.43 in eastern Wyoming. Temperatures averaged in the upper 80s to mid 90s throughout the region. The regional weather forecast predicts below average to average rainfall and above average temperatures for the second week of August.

Scattered disease reports continue to filter in to VegNet. The Sugar Beet industry is concerned about the ongoing infection from Cercospora Leaf Spot. Infection has been reported from numerous fields throughout the region during the last 7 days.

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

Most of the earlier planted fields are finished for the season, but continue to scout later planted fields for early blight and late blight.

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), super tin.

Disease Model: with a May 1 emergence date, the early blight model (threshold of 300) is averaging 610 to 640 and with a May 15 emergence (regrowth) date, the early blight model is averaging 540 - 570 throughout eastern Colorado as of August 6. In the San Luis Valley (May 1 emergence date), the early blight model is at 470; and the late blight model is still less than 1.

The late blight model (threshold of 18, with disease possible in 7 to 14 days) has not changed appreciably during the last week, and is holding at 9 to 17 in the Front Range, 19 at Fort Morgan, and 18 to 28 at northeastern sites (Wray, Yuma), with a May 1 emergence date. A mid-May emergence date lowers the disease values 1 or 2 points, only. There are still no reports of Late Blight in the state as of August 6.

Maintain an aggressive scouting program, and use the earlier emergence date to schedule more aggressive protection programs for early blight and late blight, if it shows up this year especially on later planted fields of potatoes.

DRY BEAN

Continue to scout fields for early signs of rust, white mold or bacterial diseases such as common bacterial blight, bacterial brown spot, and/or halo blight. Moderate rainfall patterns in western Nebraska and Kansas, and eastern Wyoming and Colorado during the last week could lead to more bacterial disease problems in the next few days.

If rust is detected in susceptible varieties, protectant fungicides such as Bravo at a 14-day phi and Maneb at a 30-day phi have been effective in recent university trials. [Note: There is no Section 18 label for Tilt available for bean producers to use in Colorado or Nebraska during 2000.]

The mid-season copper-based bactericide program (with products such as Kocide, Champ, NuCop, etc) continued during flowering to early pod fill periods can reduce common blight (bacterial brown spot, halo blight) severity later during pod bump. Maintain the protection until pod bump if disease threatens.

White mold is managed by application of fungicides such as Topsin and Benlate at 100 % to full bloom with good coverage of the blossoms to reduce infection sites for the pathogen. Manage irrigation water to dry out plant canopies and soil surfaces between waterings.

Western flower thrips feed in developing flowers and can cause flower and pod abortion. Five flower thrips per blossom can reduce the number of seeds per pod and number of pods per plant. Treatment with products such as Orthene can reduced western flower thrips losses.

ONION

Most seeded fields continue to bulk up well, and may benefit from a 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 transplanted or seeded onion, other than a few plants affected by bacterial soft rot, purple blotch and possibly a trace amount of downy mildew in the Front Range. 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, 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 430 to 520 in the Front Range and Fort Morgan areas, 400 to 430 in the Arkansas Valley and West Slope areas. Therefore, our onion areas have exceeded the threshold and require aggressive scouting programs to detect early infection in the next 7 to 14 days in seeded fields; especially later fields of onions. (Schwartz)

ON HORNWORMS AND "HUMMINGBIRD" MOTHS

Hornworms are among the largest of all caterpillars found in Colorado, some reaching lengths of three inches or more. Characteristically they sport a flexible spine ("horn") on the hind end, although in some species this is lost and replaced with an eyespot marking. Hornworms that are most widely recognized are those that feed on tomatoes - the tomato hornworm and the more common tobacco hornworm. Although these species are considered garden pests, the great majority of the approximately two dozen local hornworm species are rarely observed and do not cause plant injury.

Full-grown hornworm larvae migrate from their host plant and dig in loose soil where they pupate. Pupation occurs a few inches below in a small chamber of packed earth. Pupae are typically brown, two inches or more in length, and many have a pronounced "snout" off the head end.

Adult stages of the hornworms are heavy-bodied, strong flying insects known as sphinx or hawk moths (Lepidoptera: Sphingidae). However some local species are popularly known as "hummingbird moths", reflection of their superficial resemblance to hummingbirds in flight while they similarly feed from deep-lobed flowers. The whitelined sphinx is the species most commonly observed in this habit and is usually most active late afternoon and during dusk. The great ash and twinspace sphinx are other species commonly observed in "hummingbird moth" behavior. Adults of most hornworms (including the "tomato" hornworms) fly after dusk and are rarely observed except occasionally at porch lights.

Life History and Habits of Selected Hornworms of Colorado

"Poplar Sphinx Moths"

The largest sphinx moths in Colorado are the western poplar sphinx (*Pachysphinx occidentalis*) and the large poplar sphinx (*Pachysphinx modesta*) occur throughout western North America in association with their primary host plants, cottonwood and poplars. The developing caterpillars are generally green and white with light striping. They feed heavily upon tree leaves but are never abundant enough to cause injury to the tree. There are usually two generations per season, with adults from the second generation present in July and August.

"Tomato Hornworms"

The most familiar hornworms are those associated with tomatoes and related plants. This is a complex of two species, the tomato hornworm (*Manduca quinquemaculata*), and the tobacco hornworm (*Manduca sexta*). Both the tobacco hornworm and the tomato hornworm are pests in vegetable gardens. The caterpillars chew leaves, and plants can be defoliated rapidly. Fruits may also be chewed. Tomatoes are particularly susceptible to injury, but other related plants, such as peppers and potatoes, are occasionally infested.

The tobacco hornworm is usually much more common in regional vegetable gardens than the tomato hornworm, but both may be found together and they have generally similar habits. The tomato hornworm has a green "horn" with black sides, while that of the tobacco hornworm is red. The caterpillars also are differentiated by the white striping along their sides. These form a series of V's with tomato hornworms, while there are diagonal dashes on the tobacco hornworm. Occasional dark forms of the tomato hornworm larvae occur. The caterpillars of these are much darker than the normal green, although the adult moths differ little in appearance.

Many of the tomato and tobacco hornworms overwinter as pupae in the soil in the vicinity of previously infested gardens, typically emerging in late May and June. However, the adult moths are strong fliers that may fly long distances, with some apparently migrating into Colorado in late spring from more southerly areas. Female moths lay large pearl-colored eggs on the upper surface of leaves. The young caterpillars hatch and feed on the plant for a month or more. They have tremendous appetites and consume large amounts of leaves as they grow older and larger. After feeding, they wander away from the plant and pupate in the soil. In southern areas of the region, a second generation appears to occur with caterpillars present in late July and August.

Adult moths best can be separated by examining the hind wing which has two separate wavy bands next to the border on the tomato hornworm that are fused with the tobacco hornworm. The white marks on the abdomen of the tomato hornworm are also more angularly marked.

Control in Gardens: "Tomato" hornworms are easily controlled by most available garden insecticides (carbaryl, permethrin, etc.). A biological control organism that is also highly effective and sold commonly is *Bacillus thuringiensis* (Dipel, Thuricide, etc.). Hornworm larvae may also be hand picked although they can be surprisingly difficult to detect due to their cryptic coloration. Larvae tend to feed on the exterior parts of the plant during shadier periods, near dusk and dawn, when they may also be more readily observed and destroyed.

"Whitelined Sphinx"

The whitelined sphinx (*Hyles lineata*) is the most common hornworm of Colorado and, by far, is the most commonly encountered "hummingbird moth". Larvae develop on a wide variety of plants but rarely significantly damage those considered economically important. Portulaca, primrose and wild grape are among the most common hosts for the larvae. During rare occasions, there may be large outbreaks of caterpillars that sometimes result in very visible migrations across roadways when food plants are exhausted.

Hornworms of the whitelined sphinx can be highly variable in color. Most are predominately green, with some yellow, white and/or black markings. Less commonly, predominately black

forms, with yellow markings, may be present. Adults have a prominent white band on the upper forewing.

Achemon Sphinx ("Hornless Hornworm")

Larvae of the achemon sphinx (*Eumorpha achemon*) are unusual in that they lose the terminal "horn" after the first molt. Instead, subsequent larvae stages are marked by having a prominent "eyespot" marking at the hind end. The caterpillars develop on Virginia creeper, grape and related vines. Apparently there is one generation produced per year, with full-grown caterpillars being most commonly observed in late August and early September. (Cranshaw)

SOME COMMON HORNWORMS FOUND IN THE REGION

Common Name	Scientific Name	Host Plants; Notes
Whitelined sphinx	<i>Hyles lineata</i>	Very wide host range that includes primrose, portulaca, apple, grape, four o'clock, and peonies. The adult is marked with strong white bands on the wing and is by far the most commonly encountered "hummingbird moth".
Achemon sphinx	<i>Eumorpha achemon</i>	Grape, Virginia creeper, woodbine. These purplish-brown caterpillars lose the characteristic "horn" and have in its place only a dark eyespot.
Tobacco hornworm	<i>Manduca sexta</i>	Tomato, eggplant and other nightshade family plants. The most common of the "tomato hornworms".
Tomato hornworm	<i>Manduca quinquemaculata</i>	Tomato, eggplant and other nightshade family plants
Elm sphinx	<i>Ceratomia amyntor</i>	Elm
Great ash sphinx	<i>Sphinx chersis</i>	Ash, lilac, privet
Wildcherry sphinx	<i>Sphinx drupiferarum</i>	Plum, cherry, chokecherry
Giant poplar sphinx	<i>Pachysphinx modesta</i>	Poplars, willow. Along with the Columbia basin sphinx this is the largest species.
Columbia basin sphinx	<i>Pachysphinx occidentalis</i>	Poplars, willow. Along with the giant poplar sphinx this is the largest species.
Twinspot sphinx	<i>Smerinthus jamaicensis</i>	Poplar, birch, elm, willow, ash, apple
Common clearwing sphinx	<i>Hemaris thysbe</i>	Honeysuckle, viburnum, hawthorn, snowberry, cherry, plum. Adults have clear wings and resemble oversized bumblebees.

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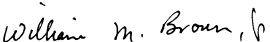
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Sincerely,


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