7-14-1995

CropWatch No. 95-16, July 14, 1995

Lisa Brown Jasa
University of Nebraska-Lincoln, ljasa@unlnotes.unl.edu

CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 95-16
July 14, 1995

Scout soon for corn rootworm beetles

Adult corn rootworm beetles are expected to begin emerging during the last two weeks of July, about two weeks later than normal. Both the northern and western corn rootworms are about 1/4 inch long, but western corn rootworm adults are pale yellow-green beetles with a black stripe on each wing cover. Northern corn rootworm beetles vary in color from light green to tan, and do not have stripes.

Beetles emerging before silk emergence may feed on corn leaves. They feed by scraping the surface tissue, leaving a white parchment-like appearance. Silks become the favored food once they emerge. There are no thresholds for silk-clipping damage based on beetle numbers because damage levels are not correlated well with beetle densities. Usually an average of at least 10 beetles per silk are required to seriously affect pollination. An insecticide may be needed if there is severe silk feeding at 25-50% pollen shed

During August these beetles will be laying eggs in corn fields. These eggs overwinter in the soil, hatch into rootworms in the spring, and feed on corn roots if continuous corn is grown. However, not all continuous corn fields have economic infestations of corn rootworms. Weekly scouting of adult rootworm beetles in July and August will provide information necessary for deciding whether a rootworm insecticide is needed next year. People using adult beetle control programs should base treatment and application timing on field scouting results.

Hot off the press: *Adult Corn Rootworm Management*, MP63-C, University of Nebraska Cooperative Extension publication. $1.

Begin scouting for corn rootworm beetles soon after beetle emergence and continue scouting weekly until threshold levels are exceeded or beetle activity stops. Examine 50 plants per field, taking samples from each quarter of the field. Sampled plants should be several paces apart, so that examining one plant doesn't drive beetles off of the next plant to be sampled. The most reliable method is to examine the whole plant for beetles. Beetles may hide behind leaf sheaths or in the silks, so care is required to observe all beetles. An alternative method is check for beetles only in the ear zone (the area including the upper surface of the leaf below the primary ear and the under surface of the leaf above the primary ear).

In continuous corn if beetle counts exceed 0.75 beetle per plant, damaging populations of corn rootworms are possible in that field next year. In first year corn, there is a higher proportion of female beetles, so the threshold is lowered to 0.45 beetle per plant. These thresholds are based on a 24,000-plant population per acre. The number of beetles per plant to equal a threshold level should be adjusted for different plant populations (see NebGuide G86-774, *Western corn rootworm soil insecticide treatment decisions based on beetle numbers*). People scouting using the ear zone method should divide the above thresholds in half, since on average only 50% of the beetles on a plant are counted using this method.

(Continued on page 116)

WWW Invitation

Soon *CropWatch* will be available electronically along with other Extension publications on the World Wide Web. Mostly text will be posted first, however later, graphics and expanded materials will be added. The address is http://ianrwww.unl.edu/ianr/pubs/extnpubs.html

Inside

Adult rootworm beetles (Continued from page 115)

In addition to visual scouting methods for rootworm beetles, yellow sticky traps may be used. Research conducted in Iowa identified an unbaited Phercon AM trap as the best trap among several tested. Attach traps to the corn plant at ear height and leave in the field for a week. Use 12 traps per field, spread out over the whole field. If beetle counts exceed an average of six beetles per trap per day, this is equal to the treatment threshold. If beetle counts are below this level, continue sampling until the threshold is exceeded or beetle activity stops. Some advantages of using traps rather than visual examination include 1) traps catch beetles over an extended time and are not influenced by time of day or weather; and 2) counts are not influenced by the experience or skill of the sampler. Traps are available from the manufacturer, Trece (408-758-0204), or from Great Lakes IPM (517-268-5693) or Pest Management Supply, Inc., (800-272-7672) and cost about $1 each.

Rotating the field out of corn, or using an insecticide at planting or cultivation would be ways to prevent economic damage. Fields remaining below the threshold level do not need to be treated with a rootworm insecticide next year.

Individuals using adult beetle control programs should begin treatments when the beetle threshold is exceeded and 10% of the female beetles are gravid (abdomen visibly distended with eggs). This is an important point since the first beetles to emerge are mostly male, and females require at least 10-14 days of feeding before they can lay eggs. Treatments applied too early may be ineffective if large numbers of females emerge after the residual effectiveness of the treatment has dissipated. Continue to monitor fields weekly after treatment for rootworm beetles. If beetle numbers exceed 0.5 beetles per plant, retreatment is warranted. Late maturing fields are particularly susceptible to corn rootworms from nearby earlier maturing fields.

Rates and restrictions of registered insecticides for adult corn rootworm control can be found on the label or in EC 94-1509, *Nebraska Insect Management Guide for Corn and Sorghum*, available at your local University of Nebraska Extension office.

Bob Wright, Extension Entomologist, South Central District

Sugarbeet webworms found

Sugarbeet webworms have been found in several sugarbeet fields in the North Platte Valley. These insects have not been a substantial problem in the area for many years.

The webworm can be identified by a dark line down the center of the back of the larvae with a row of dark circles on either side with a long bristle coming from each circle. These worms will jerk violently when picked up or disturbed. Fully grown larvae will be 1 1/4 inches long. After hatching the young larvae feed on the underside of leaves. As they mature they begin to feed com-

(Continued on page 117)

CROPWATCH

Crop Watch is published from March through November by the University of Nebraska Institute of Agriculture and Natural Resources Communications and Information Technology, PO Box 830918, 108 Agricultural Communications Bldg., UNL, Lincoln, NE 68583-0918. To order a subscription or to change your address, write to *Crop Watch*, Box 830918, 108 Agricultural Communications Bldg. or call (402) 472-7981.

Lisa Brown Jasa, Editor

For more information about a particular subject, write the authors at the addresses below:

UNL Department of Entomology
202 Plant Industry Bldg.
Lincoln, NE 68583-0816

UNL Department of Plant Pathology
406 Plant Science Bldg.
Lincoln, NE 68583-0722

UNL Department of Agronomy
279 Plant Science Bldg.
Lincoln, NE 68583-0915

UNL Department of Agricultural Meteorology
236 L.W. Chase Hall
Lincoln, NE 68583-0728

When is it too late to apply N in corn?

Once again, nitrogen management decisions were made more difficult by Nebraska weather, as if the increased cost of nitrogen fertilizer was not enough. The extremely wet spring delayed typical fertilization practices and have left many producers with tough management decisions. In addition, many of those who applied nitrogen in the fall and early spring have had losses from leaching and denitrification. Now many producers may be asking: *When is it too late to apply N?*

Nebraska research

An experiment was conducted near Mead during the 1993 and 1994 growing seasons to answer this question. Different rates of pre-emergence nitrogen were applied as the means to develop different nitrogen levels. Sufficient nitrogen was then applied at either the 6-leaf (V6), 12-leaf (V12), 16-leaf (V16), tassel (VT), brown silk (R1.5), milk (R3), or hard dough (R4.5) growth stages. A chlorophyll meter was used before each application to evaluate the degree of nitrogen deficiency.

Chlorophyll meter readings taken from these areas were compared to corn that was sufficiently fertilized to determine the degree of nitrogen deficiency or sufficiency index (SI) as it is commonly referenced. Sufficiency index is a measure of relative chlorophyll meter readings to the adequate nitrogen standard. The lower the sufficiency index the greater the nitrogen deficiency.

The amount of corn grain yield response is dependent on when the nitrogen was applied and the degree of nitrogen deficiency at the time of application. In general, the greater the nitrogen deficiency the greater the yield response. In 1993, (an exceptionally wet year with below normal temperatures) corn with an SI less than 90% responded to nitrogen application up to milk stage. However, when nitrogen was applied to corn with an SI greater than 90% at or after milk stage, yields were reduced by as much as 14 bushels per acre.

Tips for using a chlorophyll meter

University of Nebraska Extension specialists recommend applying nitrogen if the sufficiency index (relative chlorophyll meter reading) is below 95% (NebGuide G93-1171-A). However, it is important to note that a 95% SI at the six-leaf stage can be quite different than an SI of 95% at tassel. As corn grows, more nitrogen is required to sustain growth and grain fill until late reproductive growth. In most situations a 95% SI at the six-leaf stage indicates a much more severe nitrogen deficiency than a 95% SI at tassel. An exception would be if a large amount of organic nitrogen was mineralized after the six-leaf stage so that the plant could get a sufficient supply of nitrogen later.

Summary

In general, when nitrogen deficiency is visually detected (leaf firing), it is too late for the plant to fully recover by applying additional nitrogen. However, the earlier the nitrogen is applied the greater the yield response. **Nitrogen applied to corn slightly nitrogen deficient (SI > 90%) after tassel is unlikely to increase yields and may depress yield significantly.** However, when corn is extremely deficient (SI < 90%), nitrogen applied up to the milk growth stage resulted in a positive yield response. The best way to determine the degree of nitrogen deficiency is a chlorophyll meter.

The next question most producers will have is: ***How much N fertilizer should be applied?*** We don't know exactly how much nitrogen is required to obtain the maximum yield response at each growth stage, especially relative to the degree of nitrogen deficiency. (Some information is available on how much nitrogen is required at side-dress). It seems likely that later in the growing season less nitrogen should be required to obtain the maximum yield response, but at this point, 50 lbs nitrogen per acre is recommended prior to tassel and 30 lbs after tassel up to brown silk. Nitrogen applied after brown silk is not likely to increase yield unless SI is < 90% It may decrease yield if SI is > 90%.

D.L. Binder and D.H. Sander
Extension Soil Specialists

Sugarbeet webworms

(Continued from page 116)

pletely through the leaves causing severe defoliation.

Rapid and severe defoliation occurs as larvae reach the final instar stage. Currently there is a large variation in the size of the larvae indicating that a good deal of defoliation potential still remains. Base treatment decisions on the amount of defoliation and the number and size of larvae present. If a lot of small larvae are present, much more damage can be expected. Smaller beets are more likely to be severely damaged by the rapid defoliation of these larvae, but heavy populations can defoliate larger beets as well. Chemicals labeled for control of webworms on sugarbeets include Sevin, Lannate and Lorsban 4E.

Gary Hein, Extension Entomologist, Panhandle District

Maximize weed control after wheat

Controlling weeds after winter wheat harvest is an ongoing challenge for Nebraska producers. Surveys taken after winter wheat harvest in west central and southwest Nebraska usually show barnyardgrass and green foxtail as the leading summer annual grasses infesting winter wheat fields. Other grassy weeds include sandbur, stinkgrass, and witchgrass. In addition to the summer annual grasses, Russian thistle and kochia are two broadleaf weeds that may be troublesome after winter wheat harvest.

The effectiveness of post-harvest weed control is often influenced by production practices associated with the previous wheat crop, such as winter wheat variety, fertilizer practices, planting date and rate. Other factors influencing weed control include: weeds that are too large; cutting off weed tops with the combine; crop rotation; temperature when spraying; rain the day of spraying; streaks caused by sprayers; terraces; dust; straw; chaff; and weed seed distribution.

Many options besides increasing herbicide rates are available for controlling weeds after wheat harvest. It takes a total weed management package to obtain maximum control. Stands of vigorous winter wheat will compete better with weeds, allowing you to concentrate on weed control in the fallow. Timely weed control, fertilizing if needed, proper seeding, planting during the optimum time, selecting a competitive winter wheat variety, and weed control in the growing wheat with herbicides offer the best chance of reducing weed population and vigor after harvest. In addition, it's essential that you watch closely and spray at the proper time to control weeds. Most labels state that weeds must be treated before they are six inches tall. If weeds are under severe drought stress, wait for rain and spray about a week later.

A mixture of Cyclone + atrazine offers good control of both small and mature barnyardgrass, but is less effective on medium or large plants. Control of barnyardgrass is poor with Cyclone + atrazine when sprayed during the tillering to boot stage. However, once barnyardgrass has headed, the mixture again provides good control. Spraying after the grass has headed allows seed production. In addition, the longer the weeds grow, the more soil water is used.

Several options are available for using nonselective herbicides with difficult-to-control weeds. With Cyclone be sure to use a minimum of 2 pints of X-77 or equivalent surfactant per 100 gallons of solution. Use 2 quarts of X-77/100 gallon of spray solution if using less than 20 gallons of carrier. A surfactant also needs to be added to Roundup. The label rates are 2 qt/100 gallons of spray solution (0.5% v/v). Landmaster BW has a surfactant included. With Roundup or Landmaster BW, add ammonium sulfate (spray grade) at 17 lb per 100 gal of spray solution. The ammonium sulfate is the first item put into the spray tank after the water. Ammonium sulfate is especially helpful when stress conditions are present.

One cannot easily identify weeds under stress; therefore, it is wise to always add ammonium sulfate. Improve control by increasing the rate of Roundup or Landmaster BW. A spray volume of 5 to 10 gallons per acre should be used with Roundup and Landmaster BW.

Our research and field surveys suggest that atrazine combined with either Cyclone or Landmaster BW is an effective treatment if applied before weeds are too large. Use Landmaster BW + atrazine on grasses from tillering to the boot stage. If weeds are mature, use the Cyclone + atrazine combination. Do not use Roundup or Landmaster BW on days that it will rain or when temperatures reach 95°.

Split treatments have been especially effective. With the split treatment, the first application is in July or early August. A second application in September should contain at least 1 lb/A of atrazine and possibly Cyclone or crop oil concentrate, depending on the amount and size of volunteer winter wheat, downy brome or jointed goatgrass present. The atrazine rate varies with soil and rainfall patterns. In southwest Nebraska use at least 2 lb/A of atrazine, but in the Panhandle, 1/2 lb/A is often the maximum in one season. Be careful not to exceed the label rate for atrazine with the two combined treatments. The advantage of the split treatments is that they provide excellent control of volunteer winter wheat and other winter annual grasses.

If winter annual grasses such as jointed goatgrass, downy brome or rye are a problem and a winter wheat-fallow rotation is being used, till immediately after harvest to plant these weeds.

Robert N. Klein
Extension Cropping Systems Specialist
Gail A. Wicks
Extension Weeds Specialist
both in the West Central District
Drew J. Lyon
Extension Dryland Cropping Systems Specialist
Panhandle District

Check corn roots for rootworm injury

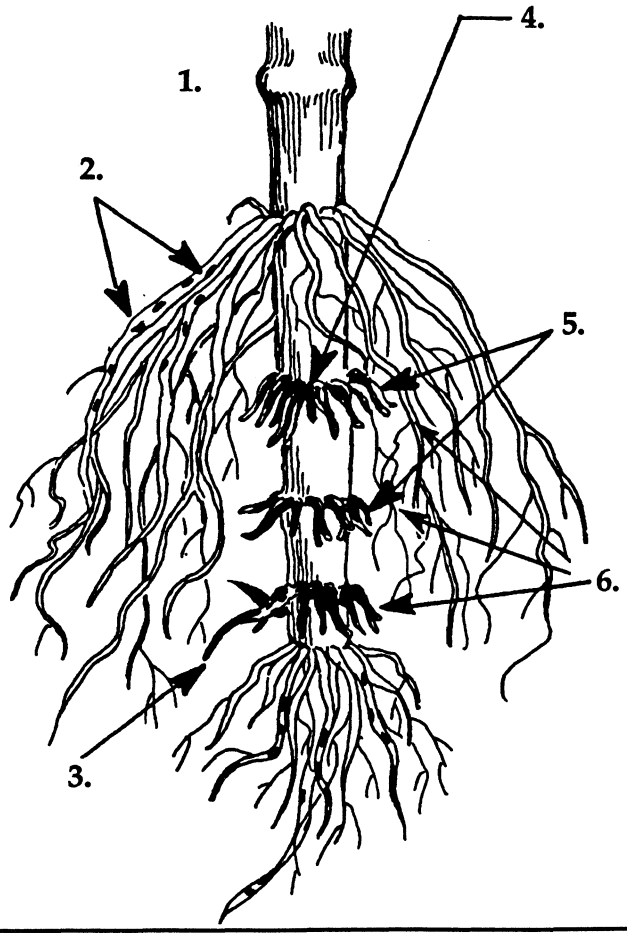
Third (last) instar rootworm larvae were seen at several locations last week. We expect some pupation to occur this week (7/10) and possibly beetle emergence to begin next week. Typically, rootworm beetles can begin to be found around the Fourth of July. This year beetle emergence will probably be delayed at least 10 days. Timing of beetle scouting and, if needed, beetle control efforts will be delayed, and should be based on local conditions. (See Page 115 for procedures for rootworm beetle scouting.)

The beginning of beetle emergence will indicate that rootworm larval feeding is ending. Although rootworm larval development is delayed this year due to early cool temperatures, the last two weeks of July would be a good time to dig roots to evaluate the efficacy of your rootworm management program.

Root damage from rootworm feeding can be rated using the Iowa 1-6 injury rating system (see diagram). Corn plants must have at least three root nodes clearly visible to use this system. Dig at least 10 randomly selected plants from several areas of a field. Leave a 9-inch cube of soil surrounding the root system, wash the roots to remove soil and rate each plant for injury using the rating scale. The relationship between root injury rating and yield loss is complex, but usually a root injury rating of three or more is needed to cause economic yield loss. The corn plant has the capacity to regrow roots and compensate for some early season injury, especially if soil moisture and fertility are adequate during regrowth. If several weeks have passed between the end of rootworm injury and the time of root rating, new root growth may hide injury. Examine roots carefully to accurately rate them.

Rootworm insecticide efficacy can only be reliably evaluated if replicated, untreated check strips are left in the same field as the treatment. Without check strips, you won't know whether the absence of injury is due to insecticide efficacy or the absence of rootworms. The mere presence of adult beetles or rootworms in a field is not an indication of insecticide failure. Soil insecticides are applied in a narrow band to the soil and corn roots grow beyond the treated zone where rootworm larvae may survive.

Bob Wright, Extension Entomologist
South Central District



University of Iowa corn root rating system

Rating	*Description of root system*
1	No noticeable feeding damage.
2	Feeding scars present but no root pruning.
3	At least one root pruned, but less than an entire node of roots pruned.
4	At least one full node of roots pruned but less than two full nodes.
5	At least two full nodes pruned, but less than three full nodes.
6	Three or more full nodes of roots pruned.

To qualify as a pruned root, the root must have been pruned to within 1.5" of the plant. It is not necessary for all of the pruned roots to originate from the same node to qualify as a root system with a full node pruned. It is only necessary that the number of roots pruned is equivalent to that in a full node.

Factors right for Holcus leaf spot

Holcus leaf spot, a bacterial disease of corn, is likely to be seen soon, partly as a result of last week's stormy weather. Unlike Goss's wilt, which can cause significant yield reduction, Holcus spot is usually a minor disease that has little or no impact on yield.

Leaf lesions are round to slightly oblong spots ranging in size from 1/4 inch to 3/8 inch in diameter. They first appear on the lower, older leaves commonly toward the tips. The spots are creamy-white to tan and eventually dry and turn brown, often with reddish to brown margins surrounded by a yellow halo. Similar spots may also be seen on other grassy hosts, including sorghum, millet, and Johnsongrass.

Holcus spot will be most evident in continuous corn. Warm, wet weather allows the Holcus spot bacteria to build up on leaf surfaces. The bacteria enter the leaves through natural pores (stomates) or small leaf abrasions. Driving rains and/or windy, wet weather are especially conducive to infection. The sudden appearance over wide areas causes considerable alarm and makes young corn look pretty sick, but our experience has been that plants "recover' with hotter, drier weather.

David S. Wysong
Extension Plant Pathologist

Rains to follow heat spell

The 100+ temperatures expected across the state this week were to be the first time since July 2, 1990 that the whole state reached the century mark on the same date. However, projected highs of 100-105F will fall short of daily maximum temperature records of the dust bowl, when the state had 30+ consecutive days of 100F or more.

Forecasts are calling for a return to much below normal temperatures next week coupled with normal to above normal precipitation. Above normal precipitation over a five-day period would indicate totals over 1.5 inches over eastsern Nebraska and 1 inch over western Nebraska. This would give the crop ample moisture for pollination.

Al Dutcher, State Climatologist
Agricultural Meteorology

Growing degree days (as of July 9) and *Precipitation*

Station	*3/1*	*4/1*	*3/1*	*4/1*	*1/1*	*5/14*	*5/28*	*6/10*	*7/3-7/9*			*9/1-7/9*		
Base	*32*	*32*	*40*	*40*	*48*	*50*	*50*	*50*	*Act.*	*Nrm.*	*%*	*Act.*	*Nrm.*	*%*
Ainsworth	2603	2275	1743	1535	1325	883	698	549	.00	.77	0	21.82	17.29	126
Alliance	2378	2064	1571	1363	1167	726	579	475	.03	.54	6	14.43	13.20	109
Arthur	2520	2188	1681	1453	1277	795	627	505	,16	,77	20	15.04	14.49	104
Beatrice	3100	2696	2141	1886	1606	1099	823	630	1,53	.84	182	24.73	23.59	105
Central City	2924	2569	1997	1777	1490	1016	777	603	1,12	.77	145	16.67	21.66	77
Clay Center	2951	2568	2031	1786	1532	1020	778	602	.91	.77	118	22.38	21.61	104
Concord	2748	2469	1858	1699	1318	976	741	582	.26	.77	34	21.64	22.47	96
Curtis	2786	2422	1877	1644	1457	911	697	545	.04	.77	5	11.88	16.27	73
Elgin	2726	2430	1836	1660	1347	955	746	591	--	--	--	--	--	--
Gordon	2348	2050	1542	1344	1107	721	576	470	08	.70	11	16.26	14.01	116
Grant	2636	2292	1775	1540	1422	860	665	527	.08	.70	11	14.75	15.03	98
Holdrege	2924	2519	2004	1735	1572	991	745	574	.66	.82	80	19.44	19.83	98
Lincoln	3217	2810	2222	1974	1663	1164	870	672	2.23	.77	290	21.72	22.62	96
McCook	2929	2539	1997	1735	1618	992	745	576	.91	.77	118	14.94	15.95	94
Mead	3016	2666	2076	1863	1568	1111	827	634	.83	.84	98	19.64	28.06	70
North Platte	2720	2362	1829	1597	1441	900	695	548	.00	.70	0	15.47	15.38	101
O'Neill	2631	2335	1775	1582	1306	905	700	544	.04	.78	5	20.60	18.48	111
Ord	2753	2411	1870	1649	1403	939	730	575	.08	.70	11	21.38	18.64	115
Red Cloud	3059	2641	2113	1844	1604	1055	788	603	.92	.84	110	21.78	20.63	106
Rising City	2926	2581	1998	1790	1480	1041	799	621	.55	.70	79	21.77	21.06	103
Scottsbluff	2540	2199	1700	1472	1284	776	626	510	.10	.49	21	13.55	12.75	106
Shelton	2945	2552	2023	1772	1542	1004	769	600	.79	.65	122	19.88	20.09	99
Tarnov	2786	2485	1898	1713	1404	994	763	594	.35	.77	46	20.71	20.63	100