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CropWatch No. 97-16, July 11,1997

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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 97-16
July 11, 1997

In this year's winter wheat

Post-harvest weed control critical

The 1997 winter wheat crop varies from poor to good. Some fields suffered from winter injury that reduced stands and made them less competitive with weeds. Also, the drought made many tillers abort and the reduced height of this year's crop kept the canopy open, which made for ideal conditions for weed germination and establishment when the rain finally came. The density of weeds in many of these fields is extremely high.

Controlling these weeds after winter wheat harvest will be a challenge. Post-harvest surveys 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. This year many of the broadleaf weeds such as lambsquarters, morning glory, common sunflower, Russian thistle, kochia, and wild buckwheat also will be problems.

The effectiveness of post-harvest weed control is influenced by production practices associated with the previous wheat crop, such as winter wheat variety selection, fertilizer practices, row spacing, planting date, and seeding rate. Other factors influencing weed control include: large weeds; weed tops cut off 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.

If only large broadleaf weeds are present after harvest (and these were not controlled with a harvest aid treatment), Cyclone plus atrazine should be applied soon after harvest. 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 from 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 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. Sufficient surfactant is included in Roundup Ultra and Landmaster BW. With Roundup Ultra 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 recognize weed stress so it is wise to always add ammonium sulfate. Improve control by increasing the rate of Roundup Ultra or Landmaster BW. Allow at least six hours for the Roundup Ultra or Landmaster BW to become rainfast. Some weeds require more time than others. Barnyardgrass control may require as much as 24 hours without rain for maximum control. A spray volume of 5 to 10 gallons per acre should be used with Roundup Ultra or Landmaster BW.

Our research and field surveys suggest that atrazine combined with either Cyclone or Landmaster BW is

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Sample the web *version of CropWatch*, see page 123.

Inside

Reports from the field

Jim Schild, Extension Educator in Morrill County: The Panhandle and much of western Nebraska continues to be inundated with grasshoppers. Rangeland is starting to dry out and grasshoppers are moving to greener areas like cropland, acreages, yards and gardens. This is the highest number of grasshoppers I've ever seen in these areas.

It's critical that grasshoppers be treated now while they are still relatively small and treatment is affordable. Many are 1/2-3/4 inch long and will soon exceed the recommended size for treatment.

For more information on grasshopper control, three publications are available from your local Cooperative Extension Office, one each for control in crop land, rangeland, and yards and gardens. These publications also are available on the web at: http://www.ianr.unl.edu/ianr/pubs/nebfacts/nf327.htm, http://www.ianr.unl.edu/ianr/pubs/nebfacts/nf328.htm, and http://www.ianr.unl.edu/ianr/pubs/nebfacts/nf329.htm. (The last one should be available in mid July.)

Keith Jarvi, IPM Extension Assistant, Northeast Research and Extension Center: Potato leafhoppers are still hurting newly planted alfalfa fields in northeast Nebraska (See June 27 *CropWatch*). Farmers are either taking an early cutting in hopes of driving out or starving the young leafhoppers, or treating them with insecticides. Severely damaged fields need to be harvested to stimulate regrowth and recovery, even if yield is negligible. Grasshopper populations are still on the increase.

Gary Hein, Extension Entomologist at the Panhandle Research and Extension Center at Scottsbluff: Potato leafhoppers here also are causing serious damage in newly seeded alfalfa fields. It is extremely unusual to see this insect in damaging populations in western Nebraska, but the potato leafhopper can be a serious insect problem in alfalfa, dry beans and potatoes. These crops should be monitored for economic populations.

Potato leafhoppers do not overwinter in Nebraska, but migrate up the Mississippi River region annually. They are found in eastern Nebraska each year, but not always in damaging populations. Movement into western Nebraska is very unusual and is likely the result of strong southeasterly air movements during early June. Scouting recommendations and treatment thresholds for alfalfa were in the June 27 *CropWatch*.

Dry bean monitoring involves counting the leafhoppers on the plants. The threshold for potato leafhopper in dry beans is one leafhopper per trifoliate leaf. In potatoes a more complex threshold is used which ranges from 10 to 40% of the mid-plant leaves infested with nymphs.

If damaging populations of potato leafhoppers occur, any one of several insecticides registered for their control can be used. For more information, contact your nearest Extension Office.

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CROP WATCH

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Lisa Brown Jasa, Editor

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Weed control in wheat *(Continued from page 119)*

an effective treatment if applied before weeds are too large. Use Landmaster BW + atrazine on grasses from tillering to the boot stage. Atrazine antagonizes glyphosate so glyphosate rate must be increased to at least 24 oz/A. If weeds are mature, use the Cyclone + atrazine combination. Do not use Roundup Ultra or Landmaster BW on days when it's likely to rain or when temperatures reach 95°.

Split treatments have been especially effective. With the split treatment, apply Roundup Ultra or Landmaster BW alone as the first application in July or early August. A second application in September should contain at least ½ 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, ½ 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.

Many options, besides increasing herbicide rates are available for controlling weeds after wheat harvest. It takes a total weed management package to obtain maximum weed control. Stands of vigorous winter wheat will compete better with weeds, allowing you to concentrate on weed control in the fallow. Preparing a good firm seedbed, timely weed control, fertilizing if needed, proper seeding, planting during the optimum time, selecting a competitive winter hardy winter wheat variety, and weed control in the growing wheat 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 6 inches tall. If weeds are under severe drought stress, wait for rain and spray about a week later.

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 weed seeds and ensure maximum weed germination during the fallow period, where control options are available.

Robert Klein, Extension Cropping Systems Specialist
Gail A. Wicks
Extension Weeds Specialist
Both of the West Central Research and Extension Center
Drew J. Lyon, Extension Dryland Crops Specialist, South Central Research and Extension Center

Crop Diagnostic Clinic

The 1997 UNL Crop Management and Diagnostic Clinics will feature demonstration plots and field presentations on crop injury diagnostics, transgenic crops, insect, weed and disease management, nitrogen management for corn and soybeans, pop-up fertilizers, irrigation scheduling, in-field determinations of soil moisture and soil quality parameters, manure management, and comparison and proper adjustment of no-till drills. The clinics will be July 21-22 and 24-25 at the UNL Research and Development Center near Mead. Approximately 75% of the information presented will be new from 1996 clinics.

Presenters include: Brian Benham, Bob Caldwell, Dale Flowerday, John Foster, DeLynn Hay, Gary Hergert, Keith Jarvi, Paul Jasa, Rick Koelsch, Don Lee, Mark Liebig, Alex Martin, Steve Mason, ZB Mayo, John McNamara, Lenis Nelson, Jim Peterson, Fred Roeth, Jim Stack, John Watkins, John Witkowski, Dave Wysong and Bob Wright.

Most presentations will occur in the field and emphasize hands-on learning. Continuing education credits will be awarded. Cost for the diagnostic clinic will be $225 per person ($250 at the door). Preregistration ends one week before the beginning of each clinic. Registration is not guaranteed unless payment has been received. For more information about these diagnostic clinics or for a brochure/order form, contact Cheryl Sheary at the ARDC at 402-624-8030.

Barb Ogg, Extension Educator
Lancaster County Extension Office

Restrict 2,4-D use during sensitive crop stages

Do not spray corn with 2,4-D from a week before tassel emergence until after the silks turn brown. Treatments during this critical time often interfere with pollination and reduce yield. After the silks turn brown, pollination is complete and 2,4-D can be safely used.

The state's early planted corn is now in the stage where it should not be sprayed with 2,4-D.

Do not spray grain sorghum with 2,4-D after the boot stage. As in corn, pollination problems and yield reductions result from spraying sorghum during this sensitive period. Between a 12-inch height and boot stage, use a drop extension to direct 2,4-D away from the sorghum whorl. Never use Banvel on grain sorghum after it is 15 inches tall.

Alex Martin
Extension Weeds Specialist
John McNamara
Extension Assistant
Weed Science

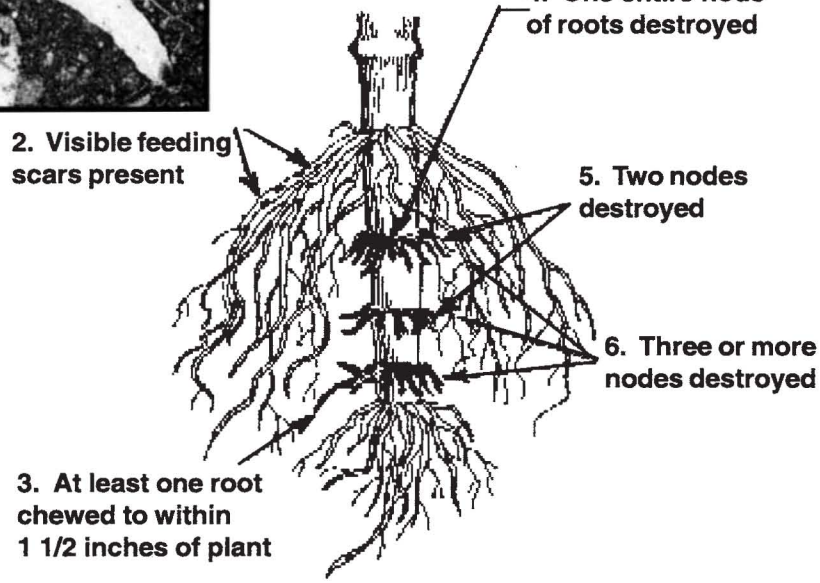
Check insecticide efficiency

Corn rootworm beetles emerge

Corn rootworm beetles were found at Clay Center July 8, with much of the rest of the population at the third (last) instar larvae stage. Beetle emergence should continue during the next week in south central Nebraska. Beetle development will be later north of Clay Center and in western Nebraska. Timing of beetle scouting and, if needed, beetle control efforts should be based on local conditions. (Procedures for rootworm beetle scouting will be described in the next issue of *Crop Watch.)*

The beginning of beetle emergence indicates that rootworm larval feeding is ending. Although rootworm larval development is delayed somewhat this year due to the earlier cooler 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 injury rating system (*see figure*). Before corn plants can be rated for injury they need to be at a growth stage where at least three root nodes are clearly visible. Dig at least 10 randomly selected plants from several areas of a field, leaving a 9-inch cube of soil with 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 3 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 the injury. Examine roots carefully to accurately rate them.



Iowa State University 1 to 6 corn root damage scale.

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.

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 does not indicate insecticide failure. Soil insecticides are applied in a narrow band and corn roots grow beyond the treated zone where rootworm larvae may survive. Also, plant lodging may occur without significant rootworm feeding. Dig and wash some roots to check for rootworm injury before assuming that rootworm damage is responsible for lodging.

Bob Wright
Extension Entomologist
South Central Research and Extension, Clay Center

Preharvest interval/crop stage limits for postemergence herbicides

Sorghum

Herbicide	*Preharvest interval or crop height limit*
Atrazine	12"
Banvel	15"
Basagran	boot
Buctril	pre-boot
Buctril-Atrazine	12"
Laddok	12"
Marksman	8"
Peak	12" broadcast, 24" directed
Permit	Layby
2,4-D	8" broadcast, boot directed

Soybeans

Most broadleaf weeds in soybeans taller than 6 inches cannot be consistently controlled with postemergence herbicides. Reason: there are no soybean herbicides that are as effective as Banvel, Clarity, and 2,4-D on large broadleaf weeds. Suppression of larger broadleaf weeds is available from several treatments.

Herbicide	*Preharvest interval or crop height limit*
Assure II	80 days
Basagran	30 days for forage or hay
Blazer	50 days
Classic	60 days
Cobra	90 days
Fusilade	Bloom
Fusion	Bloom
Pinnacle	60 days
Poast Plus	90 days

Sample *CropWatch* on the web

The web version of *CropWatch* will be available free until July 14. Check it out at: http://www.ianr.unl.edu/cropwatch. Use "cropwatch"for your I.D. and password

This offer is only available for a short time so don't hesitate to peruse our extended news service on the web. It includes more weather data, in-depth reports, research updates, and press releases as well as the newsletter. If you have any suggestions or comments, please feel free to use one of the comment reply boxes.

Attack weeds directly with bean bars

Wiper applicators are useful for controlling tall weeds in shorter crops. Weeds should be at least 10 inches taller than the crop. Roundup is the herbicide of choice for wiper applications in sorghum and soybeans. Use a concentration of 33% Roundup in water to control broadleaf and grass weeds. Shattercane and volunteer corn are very susceptible to Roundup.

Roundup is less effective against broadleaf weeds than grasses. Sunflower and pigweed control is usually good, but velvetleaf is not readily controlled. Dense weed stands make good herbicide coverage difficult with a wiper. Two passes in opposite directions will be required for good control.

Bean bars have become quite popular for controlling weed escapes in soybeans. Weeds need not be taller than the crop since they are individually sprayed with hand held spray nozzles. Roundup is registered at a 5% concentration for straight stream nozzles or a 2% concentration for spreading nozzles.

Some crop damage occurs with Roundup in a bean bar since spray droplets contact the crop. Growers have searched for treatments that are safer to soybeans than Roundup. Using Assure, Basagran, Blazer, Classic, Fusilade, Pinnacle and Poast in bean bars provides weed control with less crop injury than Roundup. These herbicides are generally mixed at the per acre rate of herbicide and surfactants in 25 gallons of water. Be certain you heed the preharvest interval when using these treatments.

Alex Martin
Extension Weeds Specialist
John McNamara, Extension Assistant, Weed Science

You asked about it . . .

I visited a soybean field that has patches and spots where the soybeans are vary stunted and small. They appear normal other than being much shorter than the other parts of the field. The field was treated with Exceed and Bicep the previous year. The affected soybean plants have nodules on them and six sets of leaves but are only 6-8 inches tall compared to the rest of the plants that are 2.5-3 feet tall. Any ideas on what's causing this?

Gary Zoubek, Extension Educator in York County

Stem elongation is much more sensitive to moisture deficits than vegetative development (the rate of leaf formation) so water stressed plants often have the same number of leaves but shorter internodes. Leaf expansion is also sensitive to moisture deficits. Does leaf area seem to be reduced in the same proportion as internodes? Can you compare the size of individual leaves in good and bad sections of the field?

Cell expansion, in leaves and internodes, is somewhat more sensitive to moisture deficit than photosynthesis. The plants may be pretty healthy even though stunted by mild stress.

If soil moisture conditions have been good, there is still a chance that something is reducing root elongation, which could prevent the plants from picking up the water they need. Diseases also can slow movement of water through roots and stems.

Bob Caldwell, Cropping Systems Specialist, Southeast and Northeast Research and Extension centers

Many of our soybean fields in Phelps County show the same symptoms you described. One farmer was concerned with a pivot of beans that were short and the leaves were not emerging properly. I looked at the field on June 27. Every plant had shriveled leaves and many of the new leaves were a very tight bud. I went back on July 2 and only about 20% of the plants were affected. The producer has watered the field since June 27 and the plants were growing out of the damage.

The field was treated with Preview + Scepter + Treflan on May 10. The beans on the pivot were planted on May 12. Beans in the pivot corners were planted a week later. You could tell the difference to the row of the beans in the pivot vs. the corners which indicated environmental problems rather than chemical. The corners were normal and the pivot has the crinkled leaves and small plants. The beans were drilled in 15" rows.

Samples were sent to John McNamara, Extension Assistant, Weed Science, who indicated damage was due to moisture stress and cool temperatures. Evidently the difference in planting date combined with no rain and cool temperatures caused the distortion. The beans are looking much better now.

Gary Hall, Extension Educator Phelps County

No endorsement or criticism is intended for any pesticides listed in this publication.

Study: Organophosphate exposure didn't impair nerves

Chronic exposure to low levels of organophosphate pesticides did not impair peripheral neurological function in Washington state farmworkers, according to a study by researchers at the University of Washington, Seattle.

Lawrence Engel, Matthew Keifer, Harvey Checkoway and Thomas Vaughan of the University of Washington and Lawrence Robinson of the Harborview Medical Center, Seattle performed the study. The researchers presented their findings at the American Public Health Association meeting in New York City.

The study was designed to investigate neurophysiological effects of chronic low level exposure to organophosphates among agricultural workers exposed to foliar organophosphate residues. The authors stated: "An estimated 600 million people worldwide are regularly exposed to pesticides, the most toxic of which are the organophosphates."

For their cross-sectional investigation, the researchers studied 67 farm workers in Washington state exposed primarily to organophosphates on the job during the course of a single season and 68 unexposed reference subjects matched in age, gender, ethnicity and education. The neurophysiological examination included sensory and motor nerve conduction, as well as neuromuscular junction testing.

The study results demonstrated no statistically significant neurological differences between exposed and reference groups. The study found no relationship between duration of exposure and electrophysiological measures of nerve function. Researchers did find that hemoglobin-adjusted erythrocyte cholinesterase activity was significantly lower in the farmworker group, but this effect was not associated with differences in neurological function.

Shripat Kamble
Extension Specialist for Pesticide Impact Assessment
Environmental Programs

Adjust combine in winter wheat to minimize weed problems at harvest

Green weeds in winter wheat can make threshing and cleaning wheat more difficult. Combine operators can make several adjustments before harvest to minimize problems.

Check the chaffer and sieve angle. Decreasing the slope of the chaffer and sieve reduces chaffer plugging, but also cuts the amount of grain that can pass through the sieve at a given louver setting. In extremely weedy situations, the chaffer and sieve should be nearly level.

Check the knives and cutterbar. Weedy crops are more difficult to cut, so make sure knife hold-downs are adjusted properly. All knife sections should be clean, sharp and unbroken.

Cutting a weedy crop sharply increases power use at the straw chopper. Reduce chopper speed if possible to lessen stress on the chopper drives. Retracting the stationary knives also can reduce power requirements at the straw chopper.

During harvest, producers and combine operators must know how to clear a plugged combine safely, especially at the cylinder/rooter-concave and at the feeder house. Two pieces of equipment can help. Floor strippers in the header will keep the crop flowing smoothly into the combine, and crop dividers can help keep weeds from wrapping around the end of the reel. Check the operator's manual for information on how to best adjust specific combines for a weedy crop.

Robert Grisso
Agricultural Machinery Specialist
Biological Systems Engineering

Diagnostic Clinic update

Corn samples exhibit environmental stress

Agricultural

Most corn samples submitted to the UNL Plant and Pest Diagnostic Clinic recently are showing environmental and nutrient problems.

Corn samples continue to be submitted for gray leaf spot testing, however few new samples have been diagnosed with the disease. Eye spot has been diagnosed. Soybean samples have exhibited some root rot, Rhizoctonia root rot and chemical injury.

Plant specimens needing identification are arriving at the clinic regularly. Some weeds that have been identified include: cleft gromwell, swamp smartweed, pineapple weed and canarygrass.

Horticultural

There have been many insect infestations in ash and honey locust trees this spring. While damage may be noticeable (i.e. speckling, brown spots on leaves and distorted growth), the injury is not serious and the insects are now dispersing. Only in rare cases is treatment justified.

Most caterpillars on trees and shrubs can be controlled by using Dipel. Caterpillars active this time of year include: catalpa sphinx, greenstriped mapleworm, walnut caterpillar, mimosa webworm, leafroller caterpillar, leaf crumpler and the white-marked tussock moth.

There also has been concern about the appearance of ash leaf rust. Some samples showed the characteristic distortion of the leaf and petiole, however many have only leaf infections with no leaf distortion. The lesions are similar in appearance to those of cedar-apple rust on apples, however they tend to be slightly smaller. Ash leaf rust is not a disease of great concern to an established tree. Very young and newly transplanted trees may benefit from a preventative fungicide spray if disease pressure is heavy in the spring when infection occurs, however, for most trees a fungicide is NOT necessary. Mature trees may lose a few leaves and look a bit ragged, but fungicides are not practical.

Diane Merrell, Coordinator
Plant and Pest Diagnostic Clinic

Updates

Reports from the field *(Continued from page 120)*

Chuck Burr, Extension Educator in Clay and Webster counties: Corn and soybeans appear to be growing out of hail damage sustained a few weeks ago in an area about 2 miles wide by 10 to 12 miles long. These crops have likely been set back a few weeks and will be more prone to disease damage.

Paul Hay, Extension Educator in Gage County: The potential threat from first brood European corn borer has passed. Wheat harvest is underway with yields in the 50s (bushels per acre). Soybeans continue to suffer herbicide treatment shock.

Gerald Hopp, Extension Educator in Richardson County: European corn borers have been found in levels ranging from 5 to 20% infestation.

Gary Zoubek, Extension Educator in York County: Generally crops in York County are looking good. We've had spotty rains this past week and producers are getting the gravity irrigation started. There has been a little green snap damage from some recent storms, but it has been widely spotted due to stage and hybrid.

Dick Ronnenkamp, Extension Educator in Boone and Nancy counties: The cool Fourth of July weather should have slowed corn growth. Most fields look great. Soybean quality ranges from poor to great. Many fields seem to be slow to develop while a few are filling the rows. Potato leafhoppers are active in alfalfa. The second cutting is just starting.

Precipitation

(% = percent of average)

	6/30-7/6		9/1-7/6	
	Act.	%	Act.	%
Ainsworth	3.27	426	19.36	111
Alliance	0.04	7	9.47	74
Beatrice	0.20	24	16.81	74
Concord	0.32	41	16.24	75
Elgin	0.91	116	13.04	65
Holdrege	0.00	0	13.34	73
McCook	0.07	10	13.05	80
Mead	0.96	120	10.08	44
North Platte	0.00	0	14.21	95
Ord	1.18	152	13.22	65
Red Cloud	0.00	0	15.68	83
Scottsbluff	0.04	8	9.42	76
Sidney	0.00	0	15.23	116
York	1.02	132	14.82	68

For data on more emergence dates and maturity classes, consider subscribing to *CropWatch* on the web, where crop water use data is updated daily.

Degree day accumulations for wheat, corn, soybeans and sorghum*

	Med. maturity wheat ending on 6/15					Corn ending 6/15/97					Soybeans ending on 6/15/97					Sorghum ending on 6/15/97				
	Emer	Act	Norm	%+/-	MC	Emer	Act	Norm	%+/-	MC	Emer	Act	Norm	+/-	MC	Emer	Act	Norm	%+/-	MC
Ainsworth	4/1	1624	1818	-11	2	5/27	684	741	-2	1	5/27	684	741	-3	1	6/1	628	677	-2	1
Alliance	3/24	1598	1704	-6	2	5/27	616	661	-2	2	5/27	616	661	-2	1	6/1	554	602	-2	1
Beatrice	3/17	1983	2239	-13	3	5/21	832	1015	-6	3	6/4	674	782	-5	2	5/31	738	856	-5	3
Concord	4/1	1657	1948	-16	2	5/26	744	830	-3	2	5/30	722	774	-2	2	6/1	688	744	-3	2
Elgin	4/1	1657	1932	-15	2	5/26	725	820	-4	2	5/30	705	765	-3	2	6/1	672	735	-3	2
Holdrege	3/17	1931	2057	-6	3	5/18	796	931	-5	3	6/3	641	716	-3	2	6/1	674	747	-3	3
McCook	3/17	2011	1980	2	3	5/19	829	872	-1	3	6/5	629	649	-1	2	5/30	731	736	0	3
Mead	3/24	1898	2152	-13	3	5/22	940	972	-5	3	6/7	629	704	-3	2	5/30	771	850	-3	3
North Platte	3/17	1889	1920	-2	2	5/19	770	840	-2	3	6/5	585	624	-2	2	5/30	680	707	-1	3
Ord	3/24	1788	2016	-12	2	5/22	751	889	-5	3	6/5	608	686	-3	2	5/23	742	876	-6	3
Red Cloud	3/17	2010	2066	-3	3	5/18	893	938	-2	3	6/3	723	721	0	2	6/1	755	753	0	3
Scottsbluff	3/24	1748	1708	2	2	5/27	666	664	0	2	5/27	666	664	0	1	6/1	599	604	0	1
Sidney	3/17	1743	1738	0	2	5/27	626	655	-1	2	5/27	626	449	-1	1	6/1	566	595	-1	1
York	3/24	1873	2087	-11	3	5/22	702	770	-3	3	6/5	644	717	-3	2	5/23	792	922	-5	3

*Growing degree days to maturity for early season (1), mid season (2) and late season (3) crops:
MC = maturity class
Corn: MC1 = 2400; MC2 = 2500; and MC3 = 2750
Wheat: MC1 = 1600; MC2 = 1840; and MC3 = 2000
Soybeans: MC1 = 1950; MC2 = 2360; and MC3 = 2450
Sorghum: MC1 = 2125; MC2 = 2200; and MC3 = 2369