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CropWatch No. 94-8, May 13, 1994

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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 94-8
May 13, 1994

Using Furadan 4F for rootworm control

Some of you may be thinking about using Furadan 4F liquid insecticide for protection of corn roots from corn rootworm damage. This is a product that has been around for many years and is being promoted heavily as a post-planting time treatment for this major insect pest of corn.

Tests have been conducted in most midwestern states in recent years to determine how well this approach is likely to work. The data indicate that this product will protect corn roots from the rootworms, if the insecticide is applied near the time of rootworm egg hatch and if the product is incorporated by cultivation, rainfall, or sprinkler irrigation. The product did not perform satisfactorily in most cases when these conditions were not met.

Our suggestion is that growers follow all label directions and restrictions when applying this and other pesticides. Furadan 4F can work for protection of corn roots from rootworms if the above mentioned and other conditions are followed closely. We also feel it is necessary to mention that this is a product with relatively high toxicity to humans and other mammals. Please exercise caution when handling and applying it.

Steve Danielson
Extension Entomologist

Fertilizing soybeans

There are probably more opinions on how to fertilize soybeans than about fertilizing corn, sorghum or wheat. In Nebraska, while potassium and sometimes sulfur and zinc are recommended for soybeans, phosphorus is essentially the only nutrient that may be deficient.

National farm magazines often quote experts whose suggestions about fertilizing soybeans differ. The most common recommendation is to fertilize the preceding crop "well". Some even state that soybeans do not respond well to direct fertilization.

We have found in Nebraska studies that soybean yields are increased with direct phosphorus applications if the soil test is below 10 ppm. This critical level of 10 ppm for soybeans corresponds to 15 ppm for corn and sorghum and 25 ppm for wheat. Even at 10 ppm the probability of soybean yield response is low. For a high probability of response the soil test should be below 6 ppm. Soils fertilized according to soil tests for commonly grown crops probably will not need phosphorus for high soybean yield because the soil test levels will be above 10 on most soils.

Research studies have shown that when phosphorus is needed, it is best applied in a band either as a starter or knifed-in to a depth of 4 to 6 inches not more that 15 inches apart. Both banding treatments will probably be superior to broadcast especially in reduced or no-till situations where there is little or no incorporation.

While nitrogen is not generally recommended for soybeans, there are years when weather and soil conditions are such that nodule formation is poor and soybeans are yellow and appear nitrogen deficient. This problem was prominent in 1993 when precipitation was much above normal. Depending on weather conditions, nodulation may be late but soybeans green rapidly after nodules become active. The best method of determining if soybeans need nitrogen is to preplant a strip with nitrogen at the same time it is applied to corn. If the strip shows a darker green color later in the season, the rest of the field can be sidedressed. If color cannot be increased with additional nitrogen, a yield response to nitrogen is not likely.

D.H. Sander
Extension Soils Specialist

Inside

Clipping not suggested after early frost

Last week's cold and snow caused many producers to inquire about the potential for damage to corn by an early-season frost. The results of research conducted after a 1992 early frost provide some clues as to what may and may not work.

Thousands of acres of corn in the 3- to 4-leaf stage in south central Nebraska were injured by frost on May 28, 1992. Corn growing points were at or below the soil surface. Damage in the affected area ranged from slight to complete defoliation. Cool, humid conditions for several days after the frost did not aid plant recovery and delayed replant decisions.

Very little data were available on the effects of early-season foliage damage. Charts estimating yield loss from hail are based on the assumption that defoliation prior to the 7-leaf stage does not reduce yield potential. This suggested that one option was to let the fields recover on their own. Replanting with corn was another option but yields would probably be reduced because of the late planting. A third option was to clip the injured plants above the growing point to remove dead and decaying tissue. Previous research on clipping corn in early vegetative stages has provided varied results. Some producers clipped damaged corn within a few days of the May 28 frost, but most damaged fields were replanted as soon as soil conditions permitted beginning June 4. Since data on corn recovery from early-season frost were limited, we decided to evaluate the three options described above.

Study description

Field studies were established at three sites northeast of Minden

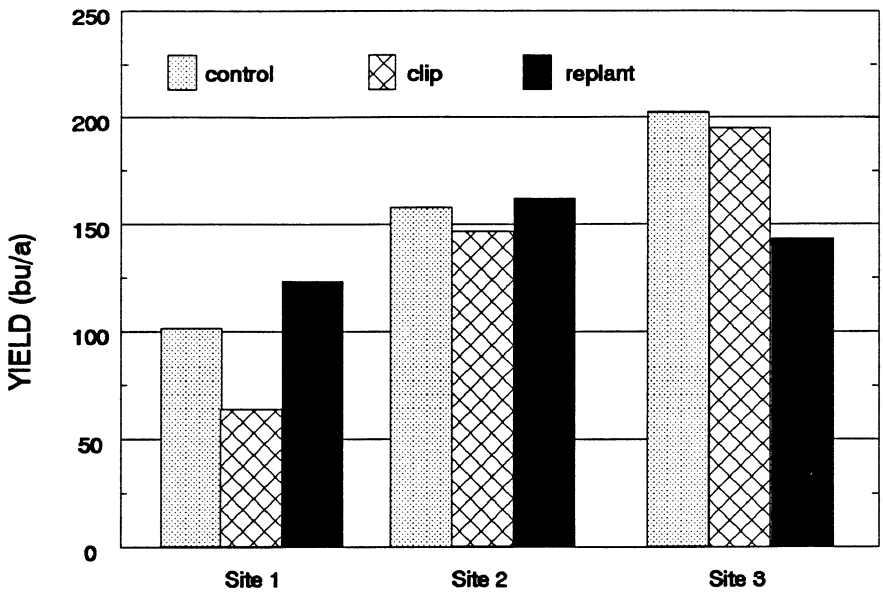

Figure 1. Corn yield following early-season frost at three Nebraska sites, 1992.

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Lisa Brown Jasa, Editor

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Clipping *(continued from page 54)*

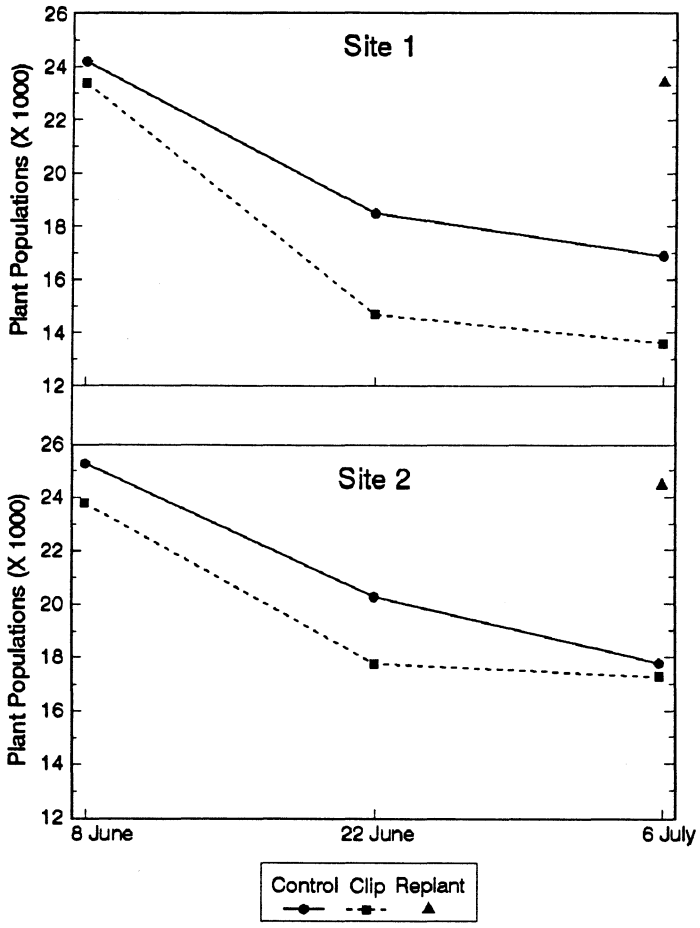

Figure 2. Early-season corn plant population changes following frost at Sites 1 and 2, Nebraska, 1992.

on June 4, 1992. The three sites provided a range of defoliation from 55% to 100%. All three sites had Holdrege silt loam soils, but Sites 2 and 3 were in an overblown phase. Extent of defoliation, corn growth stages, and undamaged stalk height are shown in *Table 1*. Undamaged stalk heights were measured from the soil surface to the point where visible plant damage appeared. Frost damage at each site was relatively uniform within the plot area. All three sites were irrigated but irrigation applications were minimal in 1992 due to abnormally wet conditions. Three treatments with six replications were set up at each location. Treatments were: Control (do nothing), Replant (by hand after all original plants were uprooted and removed), and Clip (with hand-held shears at the height of the undamaged stalk). Hybrids used at each site are also shown in *Table 1*. All three sites had been cultivated prior to the frost and all three fields outside of the experimental area were replanted June 5 or June 6. Stand counts were taken on three dates (*Figure 2*).

Table 1. Corn damage assessment and hybrids used at three Nebraska sites, 1992.

		Site	
Corn characteristics	*1*	*2*	*3*
Defoliation (%)	100	70	55
Growth stage, 28 May	4-leaf	3-4 leaf	3-4 leaf
Undamaged stalk height, (in)	2.4	2.8	3.0
Treatments		*Hybrids Used*	
Control and clip	AP525*	3162**	3162**
Replant	AP525*	DK554***	3475**

*AgriPro Seeds
**Pioneer Hi-Bred International
§ DeKalb Plant Genetics

Clipping effect

Clipping and the control yielded the same while the replant yielded poorly at Site 3 (*Figure 1*). All treatments yielded the same at Site 2. In contrast, clipping drastically reduced yield at Site 1. This yield reduction at Site 1 was associated with the large decrease in plant population with clipping (*Figure 2*). Other researchers have found that clipping will increase yield potential after early-season frost if weather conditions are optimum for plant growth and recovery. Clipping does give producers a sense of consolation by being able to do something to remedy the situation, however, clipping is unreliable and one of the other two options should be considered. A field-by-field assessment of final stand potential must be made before deciding between replanting or leaving the plants alone.

Bacteria reduce plant populations

The reduction in stands at Sites 1 and 2 was unforeseen and had serious affects on yield. The main reason for these plant population declines was the unexpected development of a bacterial soft rot caused by *Pseudomonas flourescens*. This bacterium is usually not a pathogen of corn, however, the ex-

(Continued on page 56)

Alfalfa weevil feeding underway

Alfalfa weevil larvae are now quite common in some southern and eastern Nebraska alfalfa fields. I have not scouted a field that required treatment now, but weevil numbers and damage are increasing and management may be necessary before harvest in some fields. Growers are advised to continue scouting their fields regularly and to make management decisions as appropriate.

Steve Danielson
Extension Entomologist

Clipping

(Continued from page 55)

tended unfavorable weather after the frost allowed it to become an opportunistic pathogen that was able to invade and kill the growing point of many damaged plants. We speculate that the clipping technique we used spread the pathogen from one plant to another increasing the infection rate. Clipping with field-scale equipment could have the same affect.

Clipping did not prove a dependable tool to enhance corn recovery from late-season frost damage. Thus, one of the other options discussed are recommended depending on the circumstances. A field-by-field assessment of final stand assessment must be made before deciding between replanting or leaving the plants alone. The short-term weather forecasts should be considered as well.

Roger W. Elmore and
Ben Doupnik Jr.
Extension Crops Specialist
and Extension Plant Pathologist
South Central Research and
Extension Center

Control leafy spurge now

Leafy spurge is an aggressive weed that continues to spread in Nebraska, greatly reducing the carrying capacity of grazing land. The weed is more common across northern Nebraska, but can be found elsewhere.

Leafy spurge is a perennial and reproduces from seed as well as from buds on its deep, extensive root system. It reduces forage production, and cattle avoid grazing infested areas because it is an irritant.

Control on a large area is costly and difficult. Treat small patches before they spread. Plants in a new infestation are more readily controlled than established stands because the root system is not fully developed. Once leafy spurge becomes well established it cannot be eliminated with a single herbicide treatment.

The ideal time to treat leafy spurge in much of Nebraska this year is from mid-May to early June. Leafy spurge is easily spotted now when plant tops are a bright yellow. All plant parts also contain a white milky sap.

Herbicides for leafy spurge control are: 2,4-D ester (4 pounds per gallon) at 2 quarts per acre; 1 quart of 2,4-D plus 1 pint of Tordon per acre; or Tordon 22K at 2 to 4 quarts per acre. The treatments would cost $6 per acre for 2,4-D, $15 for 2,4-D plus Tordon and $45-$90 per acre for Tordon. Apply 2,4-D in spring just before the plant flowers. A second treatment in late fall, if moisture permits good regrowth, provides increased control. If only one treatment a year is possible, make it in the spring to prevent seed production. Don't expect to eliminate leafy spurge in one or two years. It will take several years to make progress.

Tordon 22K is much more effective than 2,4-D against leafy spurge. A 2-quart-per-acre application usually provides 50-80% control a year later, and the 4-quart rate gives 90-100% control. Spring is the best time to apply Tordon, although it is also effective at other times. Tordon is long-lasting and mobile in the soil. It should not be used near trees or on sandy soil where the water table is within 15 feet of the soil surface at any time.

John McNamara
Extension Assistant
Agronomy-Weed Science
Alex Martin
Extension Weeds Specialist

Insect guide supply limited

The publication entitled Insect *Management Guide for Nebraska Sugarbeets, Dry Beans, Sunflowers, Vetch, Potatoes, and Onions* (EC92-1537) is now out of print and will not be reprinted this season.

Those of you with copies should not discard them until the replacement for this publication is available next winter. Those of you who need additional copies of this publication should photocopy originals that you have access to.

University of Nebraska Extension offices in counties where these crops are grown should have original copies that they can photocopy for you at a nominal charge. If anyone has a quantity of this publication that they don't need, please contact Gary Hein at (308) 632-1369.

Steve Danielson
Extension Entomologist

Options for postemergence weed control in corn

Several herbicides control emerged broadleaf weeds in corn. Generally, weeds should be treated before they are 4 inches tall. Control decreases with increasing weed size. Atrazine, Bladex and Extrazine II can be used to control emerged broadleaf weeds as well as grasses. Apply Atrazine to corn up to 12 inches tall. Oil concentrate should be used as an additive with Atrazine. Emulsifiable vegetable oil or non-ionic surfactant, but not petroleum oil, should be used as an additive with Bladex and Extrazine. Bladex 80W, 90DF and Extrazine II can be applied to corn up through the 4-leaf stage. Do not apply if the fifth corn leaf is visible.

Buctril can be applied alone or tank-mixed with either atrazine, Banvel, Banvel plus atrazine, or atrazine plus 2,4-D. Buctril used alone can be applied up to corn tasselling although weeds are usually too large by then.

Broadcast applications of 2,4-D can be made after corn emergence but before it is 8 inches tall. To avoid injury once the corn is taller than 8 inches, use drop nozzles and keep the spray out of the corn whorl.

Banvel at 1 pint or Banvel plus atrazine (Marksman) should be applied before the corn exceeds the fifth leaf stage. Banvel at 1/2 pint can be used before the corn is 24 inches tall. Drop extensions should be used on the spray boom for corn taller than 8 inches to keep the spray out of the corn whorl. Exercise care when using 2,4-D or Banvel near sensitive crops.

Basagran plus atrazine (Laddok) can be used to control many broadleaf weeds in corn. Laddok should be used before corn is 12 tall. Use crop oil concentrate or UAN solution as an additive with Laddok.

Refer to product labels for appropriate use rates and specific surfactant recommendations. Contact your seed corn dealer to determine hybrid sensitivity to specific herbicides.

John McNamara
Extension Assistant
Agronomy-Weed Science
Alex Martin
Extension Weeds Specialist

Herbicide rainfast timetable

When postemergence weed control is needed, the possibility of rain washing the treatment off the targeted weeds is a concern. The following table shows the "rainfast" period, or the minimum time required between application and rain for the treatment to perform effectively.

Herbicide	*Rainfast (hrs)*	*Herbicide*	*Rainfast (hrs)*
Accent	4	Extrazine II	4
Ally	4	Fusilade 2000	1
Assure II	1	Gramoxone	.5
Assert	3	Harmony Extra	4
Atrazine	4	Hoelon	1
Avenge	6	Laddok	4
Banvel	4	Landmaster\	
Basagran/Scope	4	Landmaster BW	6
Beacon	4	Marksman	4
Bicep	4	MCPA	1
Bladex	4	Option/Whip	1
Blazer	6	Pinnacle	1
Bronco	6	Poast/Poast Plus	1
Bronate	1	Pursuit	1
Buctril	1	Reflex	4
Buctril/atrazine	1	Rescue	6
Butyrac 200	6	Roundup/Rascal	6
Curtail	8	Scepter	2
Curtail M	8	Stinger	8
Classic	1	Tackle	6
Clarity	4	2,4-D	1
Cobra	.5	Tordon	2
Express	4		

Spring black stem spreading in Kansas

Spring black stem of alfalfa in south central and central Kansas has increased rapidly. In older fields significant defoliation has occurred.

Barley yellow dwarf virus in wheat was found at extremely high levels in some southeastern, south central, and central counties. Incidence varied from field to field with many above 50%.

Kansas Department of Agriculture Report (May 6)

Selecting the right herbicide additive

Postemergence herbicide activity is strongly influenced by the additives included in the spray mixture. Additives can affect both the degree of weed control and the potential for crop injury. Usually, but not always, additives that increase weed control also increase the crop injury potential.

The most widely used additives can be grouped in three categories: 1) oil, 2) nonionic surfactants, and 3) fertilizer solutions. Oil concentrates include both petroleum and seed derived oils. Ammonium containing fertilizers is an effective additive with 28% N(UAN), ammonium sulfate, and 10-34-0 being the most widely used.

It's always dangerous to make general statements about additives since the effects are both herbicide and weed specific. Nonetheless, with the intent to summarize — but not discriminate or be the final word — a generalized ranking of additives in terms of weed control and crop injury potential is:

1. petroleum crop oils or methylated seed oil (equal control)
2. nonmethylated seed oil
3. nonionic surfactants
4. fertilizer

Consult product labels for specific information. Oil-based additives often have an advantage over other additives when it is hot, dry, and the weeds and crop are growing slowly due to the stress. It is only under such conditions that an oil is suggested with some herbicides. Examples include Bladex and Classic + Pinnacle. Environmental conditons play a role in additive selection. Ammomium containing fertilizer often improves performance on certain weeds, especially velvetleaf.

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

Table 1. Additives for post emergence herbicides for corn

Check the label for specific additive rates and use conditions. Weather conditions, crop and weed growth stages and herbicide rate will determine the proper additive and use rate.

Herbicide	*Nonionic Surfactant*	*Nonionic Surfactant +28% N*	*Crop oil Concentrate*	*Crop oil Concentrate +28% N*	*28% N*
Atrazine	no	no	yes	no	no
Bladex 90DF	yes	no	vegetable oil-dry	no	no
ExtrazineII 4L	no	no	no	no	no
Extrazine II DF	yes	no	vegetable oil-dry	no	no
Accent	yes	no	yes	no	no
Beacon	yes	no	yes	no	no
Pursuit	no	yes	no	yes	no
Banvel	yes**	no	no	no	yes**
Buctril	no*	no	no*	no	no*
2,4-D	no	no	no	no	no
Accent + Atrazine	no	no	yes	yes	no
Accent + Banvel	yes	yes	no	no	no
Accent + Buctril	yes	yes	no	no	no
Laddok	no	no	yes	no	yes
Marksman	no	no	no	no	no
Buctril + Banvel	no	no	no	no	no
Sencor + Basagran	no	no	no	no	yes
Accent + Buctril + Atrazine	yes	yes	no	no	no
Beacon + 2,4-D	yes	no	no	no	no
Beacon + Banvel	yes	no	no	no	no
Beacon + Buctril Buctril	yes	no	no	no	no
Clarity	yes**	no	no	no	yes

*Labeled but not normally used due to crop injury.
**Dry conditions only

Table 2. Additives for post emergence herbicides for sorghum

Herbicide	*Nonionic Surfactant*	*Nonionic Surfactant +28% N*	*Crop oil Concentrate*	*Crop oil Concentrate +28% N*	*28% N*
Atrazine	yes	no	yes	no	no
Banvel	no	no	no	no	no
Buctril	no*	no	no*	no	no*
Laddok	no	no	no	no	no
Buctril + Atrazine	yes*	no	yes*	no	yes*
Marksman	no	no	no	no	no
2,4-D	no	no	no	no	no

*Labeled but not normally used due to crop injury.

Table 3. Additives for post emergence herbicides for soybeans

Herbicide	Nonionic Surfactant	Nonionic Surfactant +28% N	Crop oil Concentrate	Crop oil Concentrate +28% N	Dash Alone	28% N	Dash +28% N
Assure II	yes	yes**	yes	yes**	no	no	no
Basagran	no	no	yes	yes**	yes	yes**	no
Blazer	yes	no	yes*	no	no	yes*	no
Classic	yes	yes**	yes	yes*	no	no	no
Cobra	yes	yes**	yes*	yes*	no	yes**	no
Fusilade or Fusion	yes	yes	yes	yes	no	no	no
Galaxy	no	no	yes*	no	no	yes	no
Option	no	no	yes	no	no	yes	no
Pinnacle	yes	yes**	yes*	yes*,**	no (if dry)	no (if dry)	no
Poast Plus	no	no	yes	yes**	yes	no	yes**
Pursuit	no	yes	no	yes*,**	no	no	yes*,**
Scepter	yes	no	yes	no	yes	no	no
Scepter OT	yes	no	no	no	no	no	no
Select	no	no	yes	yes	no	no	no
Basagran + Blazer	no	no	yes*	no	no	yes	no
Basagran + Poast Plus	no	no	yes	yes*	no	yes**	yes**
Basagran + Blazer + Poast Plus	no	no	yes	no	no	no	no
Basagran + Scepter	yes	no	no	no	no	no	no
Blazer + Poast Plus	no	no	yes*	no	no	no	no
Classic + Assure	yes	yes*,**	yes	yes**	no	no	no
Classic + Pinnacle + Assure	yes	yes[1]*,**	no	no	no	no	no
Fusilade + Basagran	yes	no	yes	no	no	no	no
Option + Basagran	no	no	yes	no	no	yes	no
Pinnacle + Basagran	no (if dry)	yes	no	yes*	no	no	no
Pinnacle + Classic	yes (if dry)	yes**	yes	yes*,**	no	no	no
Reflex	yes	yes	yes	yes	no	no	no

*Crop injury potential is enhanced with crop oil concentrate. Use only for labeled conditions.
**Ammonium Sulfate (spray grade) can be substituted for urea ammonium nitrate

Rotary hoe provides economical weed control

The rotary hoe, when properly used, is an effective tool for weed control in row crops and also for breaking a soil crust to aid crop emergence. Crop plants seeded 2 inches deep escape appreciable injury from a rotary hoe. For best results, weed seedlings should be in the "white stage," from germination to emergence, usually 4 to 6 days after crop planting. Timeliness is critical for success because emerged green weeds, even though small, are generally too well anchored for control. A second hoeing five to seven days after the first provides improved control. Hoeing requires a dry firm soil surface. A rain-free period of several hours after hoeing is needed to desiccate the weed seedlings. A rotary hoe will not satisfactorily control larger-seeded weed seedlings including shattercane and velvetleaf because they can germinate deeper in the soil and are more firmly anchored than small-seeded weeds. Use operational speeds of 7-14 mph for rotary hoeing. Effectiveness is greater at faster speeds; however, injury to delicate crops increases with speed.

When using a rotary hoe, take care not to cover the emerging crop. Corn can be hoed practically any time until the crop is 4-5 inches. The exception would be to avoid hoeing corn planted in furrows from the spike to the one-leaf stage on loose soil to prevent covering the plants. A test strip can be hoed to evaluate damage. Do not hoe sorghum between the spike and two-inch stages to avoid covering the small seedlings. Do not hoe soybeans between the crook stage, just prior to emergence, and for approximately three days after emergence.

John McNamara, Extension Assistant, Weed Science

Soil temperature summary

Seven-day summary ending May 8

	Ave	*Norm.*	*Hi/Day*	*Lo/Day*	*Last Read*
Ainsworth	60.6	60.7	66/7	52/3	66.5
Alliance	58.2	58.3	64/7	54/1	63.5
Arthur	58.7	58.4	64/7	53/3	64.1
Beatrice	56.1	63.2	58/7	53/5	58.2
Central City	55.6	63.4	58/7	53/3	58.3
Clay Center	55.9	62.8	60/7	52/4	60.0
Concord	53.2	61.9	58/7	48/3	58.3
Curtis	58.6	61.6	63/7	55/1	62.9
Elgin	54.5	61.1	59/7	49/3	58.8
Gordon	57.2	57.5	60/7	55/3	59.6
Grant	61.1	61.9	64/6	57/1	63.5
Holdrege	59.7	62.3	64/6	56/1	64.2
Lincoln	59.7	63.5	64/2	54/4	63.4
McCook	61.8	62.5	65/6	58/1	64.4
Mead	54.6	63.2	57/2	51/4	56.7
North Platte	59.0	60.7	64/7	54/3	63.9
O'Neill	55.8	60.9	59/7	50/3	59.1
Ord	58.7	61.4	64/7	52/3	64.1
Red Cloud	60.4	63.3	65/7	56/3	65.0
Rising City	58.8	63.0	63/7	55/4	62.8
Scottsbluff	60.5	59.2	65/7	58/3	64.9
Shelton	55.9	62.8	59/7	54/4	58.9
Sidney	59.4	58.0	62/7	56/1	62.3
Tarnov	57.0	61.8	61/7	54/4	60.6
West Point	52.4	62.3	55/7	50/4	55.2

At 4 inches

Growing degree day accumulations

as of May 8

	Celsius		*Fahrenheit*			
Accumulated	*Base0°*		*Base 40°*		*Base 48°°°*	*Base 50°°°°*
from	*3/1*	*4/1*	*3/1*	*4/1*	*1/1*	*5/1*
Ainsworth	544	352	644	416	446	58
Alliance	561	360	686	440	478	67
Arthur	582	369	701	441	476	64
Beatrice	653	416	764	484	558	51
Central City	598	395	702	460	498	50
Clay Center	601	386	700	449	502	49
Concord	521	355	590	404	394	39
Curtis	624	390	750	459	549	63
Elgin	534	350	600	398	413	44
Gordon	515	343	614	415	385	58
Grant	603	376	730	448	515	68
Holdrege	635	396	752	460	548	59
Lincoln	670	429	780	499	561	50
McCook	671	413	819	496	613	72
Mead	594	382	701	450	512	50
North Platte	609	378	746	451	538	62
O'Neill	518	342	601	395	421	51
Ord	567	369	669	432	483	53
Red Cloud	657	413	779	487	567	52
Rising City	588	386	679	445	468	46
Scottsbluff	602	387	753	482	555	81
Shelton	621	403	732	474	518	53
Sidney	577	364	708	445	515	70
Tarnov	560	366	652	427	449	46
West Point	572	382	660	441	463	5

°Recent research on winter wheat development uses the 0 (32°F) base.
°°Base 40 has traditionally been used to track winter wheat development.
°°°Base 48 is used to track alfalfa weevil development.
°°°°Base 50 is used to track corn, sorghum and soybeans.