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INSECT, PLANT DISEASE, & WEED SCIENCE NEWS [No. 92-19] [Sept. 11, 1992]

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IPW Insect Science Plant Disease Weed Science NEWS

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UNIVERSITY OF NEBRASKA COOPERATIVE EXTENSION • INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES

Use tables to estimate freeze, maturity dates

Crops are continuing slow progress toward maturity. Table 1 indicates the growing degree day accumulations from the average emergence date and the estimated maturity date from data compiled through Sept. 7. The data in this table should be used with extreme caution; the estimated maturity date may fluctuate wildly over the next month. Table 1 maturity dates are based on normal temperature conditions throughout the remainder of the growing season. Five days of above normal temperatures will decrease the maturity date three days. Maturity is still expected to be between Sept. 24 and Oct. 15 for corn and between Sept. 15 and Oct. 10 for soybeans and sorghum. Crops will mature first in the southern counties of the state and progress gradually northward. Central sections of the state are projected to experience crop maturity about Oct. 1. Replanted areas should add an additional 10 to 14 days to these maturity dates.

Table 2 indicates the probability of receiving freezing temperatures before a given date. This data is based on 1951-1980 temperature records. Tables 1 and 2 can be used in conjunction to estimate the mean daily temperature needed to mature a crop by the average freeze date. You will need to know the growing degree day units required to mature your crop. For corn, a long season variety requires 2750 units, mid-season 2500 units, and short season 2400 units. For soybeans, long season varieties require 2450 units, mid-season 2360 units, short season 1950 units. For sorghum, long season varieties require 2370 units, mid-season 2200 units, and short season 2125 units.

Look for the closest site in your area from Tables 1 and 2. Note the number of growing degree day units accumulated for the crop you are growing from Table 1 and calculate the number

(Continued on page 3)

Crop watch team to meet

A crop emergency task force has been formed within the University of Nebraska Institute of Agriculture and Natural Resources to address the potential impacts of a freeze occurring before crops have matured. This committee will meet every Friday until the danger of crop damage has passed. Recommendations and/or impact statements will be released through IANR news releases and Extension agents.

Inside

UNIVERSITY OF NEBRASKA-LINCOLN, COOPERATING WITH THE COUNTIES AND THE U.S. DEPARTMENT OF AGRICULTURE IANR

Store grain to maintain initial quality

Grain quality does not improve in storage. At best, the initial quality can only be maintained. However, if proper management is neglected, the entire bin of grain may become worthless, moldy, and insect- and rodent-infested mass. Be sure that only high-quality grain goes into clean storage bins.

First, clean the bin site. Spilled grain and feed accumulations near bins are frequently overlooked as potential sources of migrating insects, as are dusts created by feed grinders or feed left in self feeders.

Remove leftover grain from the bin and sweep and vacuum the walls. If long term storage (over 10 months) is planned, consider treating the cleaned bin with protective insecticides two to three weeks before new grain is added. Apply the spray to the point of runoff to as many surfaces as possible, especially joints, seams, cracks, ledges, and corners, including outside the bin at the foundation and near doors, ducts, and fans. Malathion, methoxychlor, Tempo, or Reldan may be used for this purpose. (Use Reldan only when sorghum is to be stored.) Do not apply Tempo or methoxychlor directly to grain. As with all pesticides, read and follow label directions carefully.

Before any grain is harvested, clean all grain handling equipment including augers, combines, trucks, and wagons and remove old grain residue. Combines should be adjusted to minimize grain damage and maximize removal of fines and other foreign material. Many common grain insects are secondary feeders — feeding only on broken or cracked kernels and other materials, not sound kernels. Be especially careful when harvesting and handling grain from stressed crops because this grain is more easily damaged.

Operate augers at full capacity to reduce wear and grain breakage. With variable incoming flowrates, reducing auger speed can keep the auger operating at full capacity. Another option is to add a hopper over the auger intake, keeping it full. Be sure that all safety shields and auger intake grates are kept in place and in good working order.

To reduce the incidence of molds and insects, cool and dry the grain immediately after combining. Deterioration of grain quality occurs rapidly at higher moistures and temperatures. For example, grain held continuously at 75° F and 25% moisture content will deteriorate more in four days than 15% moisture grain held at 60° F would in 250 days. Warm, moist grain is also more prone to problems with molds and insects.

Moisture content of the grain going into storage is critical to assuring that quality can be maintained. Recommended moisture contents depend on the length of time that grain will be stored, and are given in Table 1. These recommendations assume the grain is aerated to control temperatures. Reduce the recommended moisture contents by 1 percentage point when storing low quality grain. This includes immature grain, severely cracked and damaged grain, and grain subject to previous insect or mold activity.

Grain going into a bin should be clean. Broken kernels, foreign material, and fines will create additional problems in stored grain, particularly when they accumulate in pockets. Besides being more attractive to some

(Continued on page 5)

Insect Science
Plant Disease
Weed Science News

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Lisa Brown Jasa, Editor

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Table 1. Average growing degree days (GDD) accumulations for various towns in Nebraska, as of 9/5/92

	Corn			*Soybean*			*Sorghum*		
	Emerge	*GDD*	*Mat*	*Emerge*	*GDD*	*Mat*	*Emerge*	*GDD*	*Mat*
Scottsbluff	5/15	1840	288						
Sidney	5/15	1769	292						
Arthur	5/15	1724	296						
Ainsworth	5/15	1798	289	5/29	1629	271	5/30	1618	283
O'Neill	5/15	1742	299	5/29	1580	275	5/30	1571	286
Halsey	5/15	1769	297	5/29	1607	273	5/30	1598	284
Concord	5/17	1839	307	5/30	1701	292	5/29	1713	281
West Point	5/17	1939	300	5/30	1802	287	5/29	1813	277
Gibbon	5/11	2015	293	5/26	1802	283	5/27	1800	274
Ord	5/11	1964	298	5/26	1757	287	5/27	1755	278
Shelton	5/11	2022	294	5/26	1808	283	5/27	1806	274
Lexington	5/11	2078	290	5/26	1868	280			
Central City	5/14	1969	294	5/26	1800	287	5/25	1804	283
Lincoln	5/14	2290	276	5/26	2102	270	5/25	2105	266
Mead	5/14	2117	287	5/26	1940	280	5/25	1942	275
Rising City	5/14	1974	295	5/26	1817	282	5/25	1819	282
Tarnov	5/14	1957	297	5/26	1796	284	5/25	1799	284
Grant	5/10	1954	284	5/30	1707	284	6/4	1651	284
McCook	5/10	2063	288	5/30	1805	284	6/4	1761	284
North Platte	5/10	1933	305	5/30	1651	287	6/4	1606	287
Holdrege	5/6	2146	284	5/24	1865	280	5/28	1848	280
RedCloud	5/6	2261	278	5/24	1984	273	5/28	1967	273
ClayCenter	5/11	2102	286	5/22	1918	278	5/28	1880	278
Beatrice	5/11	2230	287	5/22	2042	277	5/28	2001	277

Emerge - Average emergence date as reported by Ag Statistics or an Extension agent.
GDD - Growing degree day units accumulated since average emergence date.
Days - Number of days ahead or behind normal growth from average emergence date.
Mat - Estimated maturity date for crop given normal growth for the remainder of the growing season, based on the Julian calendar. Use dates below as guides.

260 - September 16	281 - October 7
267 - September 23	288 - October 14
274 - September 30	295 - October 21

Climate *(Continued from page 1)*

of days until the .50 probability level for a 32°F or 28°F freeze using Table 2. A 32°F freeze for four to five hours will adversely impact immature corn. When temperatures decline to 28°F for even a few minutes before increasing to 32°F, immature corn will be more affected.

Subtract the difference between the units required to mature your crop and the units accumulated from Table 1. For example:

If 450 units are needed to mature a crop and the .50 probability level will be reached in 30 days, take 450 units and divide by 30 days, which equals 15.

Add this to a base of 50 for a result of 65.

This means the daily temperature will need to average 65oF to mature the crop by the average freeze date.

Al Dutcher
State Climatologist
Department of Agricultural Meteorology, Lincoln

Table 2. The probability of reaching a base temperature by the indicated date.

	32°F			28°F		
Station	*.30*	*.50*	*.70*	*.30*	*.50*	*.70*
Ainsworth	10/02	10/08	10/14	10/12	10/18	10/24
Albion	9/26	10/02	10/07	10/05	10/11	10/17
Alliance	9/21	9/25	9/30	9/28	10/04	10/10
Ashland	10/02	10/07	10/12	10/15	10/20	10/26
Atkinson	9/28	10/04	10/10	10/08	10/15	10/22
Beatrice	10/07	10/12	10/18	10/19	10/25	10/30
Benkelman	9/27	10/04	10/07	10/09	10/15	10/21
Blair	10/04	10/10	10/15	10/16	10/22	10/28
Bridgeport	9/20	9/26	10/01	9/26	10/02	10/07
Broken Bow	9/16	9/22	9/28	9/24	10/02	10/09
Central City	10/05	10/10	10/15	10/13	10/18	10/23
Chadron	9/19	9/25	9/30	9/26	10/03	10/09
Columbus	10/02	10/07	10/12	10/13	10/19	10/24
Crete	10/05	10/10	10/15	10/17	10/22	10/27
Curtis	9/18	9/25	10/01	9/28	10/04	10/10
David City	10/05	10/11	10/16	10/15	10/21	10/27
Fairbury	10/05	10/09	10/14	10/18	10/22	10/27
Falls City	10/11	10/16	10/22	10/23	10/29	11/03
Franklin	10/01	10/07	10/13	10/12	10/18	10/24
Fremont	10/02	10/08	10/14	10/13	10/18	10/24
Geneva	10/09	10/15	10/20	10/18	10/24	10/29
Genoa	9/27	10/03	10/09	10/05	10/11	10/16
Gothenburg	9/26	10/03	10/10	10/09	10/15	10/20
Hartington	9/30	10/06	10/12	10/09	10/15	10/21
Hastings	10/09	10/14	10/19	10/18	10/24	10/29
Hebron	10/05	10/10	10/15	10/16	10/22	10/27
Holdrege	10/04	10/11	10/17	10/17	10/23	10/29
Kearney	10/02	10/08	10/14	10/13	10/20	10/26
Kimball	9/21	9/26	10/02	9/28	10/04	10/09
Loup City	9/28	10/03	10/09	10/07	10/13	10/19
Madison	9/24	9/30	10/05	10/02	10/07	10/13
McCook	10/02	10/09	10/15	10/14	10/19	10/24
Mitchell	9/19	9/24	9/30	9/29	10/05	10/11
Ogallala	9/23	9/30	10/01	9/27	10/04	10/11
O'Neill	9/23	9/30	10/06	10/05	10/11	10/17
Oshkosh	9/18	9/24	9/29	9/27	10/03	10/09
Pawnee City	10/01	10/06	10/11	10/17	10/22	10/28
Red Cloud	9/27	10/03	10/09	10/06	10/12	10/18
St. Paul	9/28	10/04	10/11	10/10	10/16	10/21
Seward	10/09	10/14	10/20	10/19	10/24	10/29
Sidney	9/19	9/25	10/01	9/28	10/04	10/10
Stanton	9/28	10/03	10/08	10/06	10/11	10/17
Syracuse	9/29	10/05	10/11	10/12	10/17	10/22
Tecumseh	9/30	10/06	10/11	10/10	10/15	10/20
Tekamah	10/04	10/09	10/15	10/12	10/18	10/24
Wakefield	9/22	9/29	10/05	9/30	10/05	10/11
West Point	9/30	10/06	10/12	10/09	10/14	10/19
York	10/07	10/13	10/18	10/17	10/23	10/28

Stored grain *(Continued from page 2)*

Table 1. Maximum recommended moisture contents for properly managed, aerated grain.

Storage Period	*Corn and Sorghum*	*Soybeans*
Fed by April	18%	13%
Marketed by June	15.5%	13%
Up to one year	14%	12%
Over one year	13%	11%

insects, broken kernels are more susceptible to spoilage than unbroken ones. Also, airflow from drying or aeration fans tends to go around pockets of fines so they cool and dry more slowly. These pockets often develop into hot spots that result in spoiled grain.

The most effective way to remove broken kernels, fines, and other foreign material is to use a high-capacity rotating grain cleaner. If this is not possible, a power spreader may be used to minimize concentration of fines, although a "doughnut-shaped" accumulation of material often occurs in the bin. If a power spreader is not used, install a grain cone in the bin to break up the inflow of grain and partially spread the fines.

More grain goes out of condition because temperatures are not controlled than for any other reason. When first storing grain, cool to the prevailing temperature. While in storage, maintain temperatures within 10°F to 15°F of the average outside air temperature. Temperatures below 50°F will prevent insect feeding and reproduction.

As grain is being augured into storage, apply a liquid or dust grain protectant, especially if the grain will be stored for 10 months or more. Use either premium grade malathion (corn and sorghum), Reldan (sorghum only), or Actellic (corn and sorghum). Power spray applicators are preferred over gravity drip applicators because they provide more uniform coverage, giving better insect control.

Treating when the grain is above the recommended moisture for long term storage and the grain temperature is above 90° F will limit the effectiveness of the insecticide, as the combination of moisture and temperature will increase the breakdown rate. If grain must be treated when it is warm, use an aeration system to cool it as quickly as possible. Operation of the aeration system will not remove the protectant from the grain.

After the grain has been leveled in the bin, topdress the surface with both Dipel and malathion, or Actellic (corn and sorghum), or Reldan (sorghum only). Dipel works against Indian meal moths while malathion is needed for beetle control. Actellic and Reldan control both types of insects. (Do not treat soybeans with malathion, Reldan, or Actellic.) If Indian meal moths have been a problem in the past, use Vapona resin strips (1 strip per 1,000 cubic feet of air space) in the bin space above the grain.

Stored grain represents a major investment. Precautions taken as the grain is put into storage can pay dividends later by helping to assure that quality is maintained.

David P. Shelton, Extension Agricultural Engineer
David D. Jones, Assistant Professor Biological Systems Engineering
Keith J. Jarvi, Extension Assistant Integrated Pest Management

Insect Science

Don't discard 1992 insect guides

Please keep your 1992 versions of the Insect Management Guides for Field Crop Insects for use in 1993. It may be that we will not revise and/or reprint these three publications for 1993. Instead, we may simply print a short addendum that will contain the pertinent changes that you should be aware of. These addendums will be available at your local Extension offices at little or no cost and can be slipped inside the cover of your 1992 Guides so you have the latest information.

The three Guides that we are referring to are: EC92-1509, *Insect Management Guide for Nebraska Corn and Sorghum*; EC92-1511, *Insect Management Guide for Nebraska Alfalfa, Soybeans, Wheat, Range, and Pasture*; and EC92-1537, *Insect Management Guide for Nebraska Sugar Beets, Dry Beans, Sunflowers, Vetch, Potatoes, and Onions*. There are two reasons why we may not revise and reprint these for 1993. One is that few changes need to be made for 1993 because there are few new insecticides and/or uses that we have been made aware of for next season. In addition, we have limited funds for the publication of Extension publications and

(Continued on page 6)

Plant Disease

Potential for wheat streak mosaic high for 1993

In last week's newsletter, we reported on a volunteer wheat survey in Red Willow, Perkins, Keith, Deuel and Garden counties. Very little early volunteer wheat was found; however, many of the stubble fields had an abundance of green foxtail, witchgrass and stinkgrass. Seventy five percent of the collected samples of these grassy weeds, along with an early volunteer wheat sample, tested positive for wheat streak mosaic virus. The highest incidence of virus was found in green foxtail.

Mick Evertson, Extension Agent, Kimball-Banner counties, reported finding volunteer wheat heavily infested with curl mites from hailed areas in northern Kimball and eastern Banner counties. Where volunteer wheat was effectively destroyed, no curl mites were found. Also, curl mites were not found outside of the hail damaged areas with the possible exception of southern Kimball county. In this area a severe hail storm damaged or destroyed wheat that was just past heading. Although volunteer wheat was not found, the hail produced late tillering which may have carried mites over the summer.

Based on the results of these surveys, I would conclude that the potential for wheat streak mosaic in the 1993 winter wheat crop will be high unless a major effort is made to destroy the grassy weeds and volunteer wheat in stubble with the next 7 to 10 days. Planting next to a weedy stubble field may be risky this year.

John E. Watkins
Extension Plant Pathologist
Lincoln

Corn root and stalk rot now appearing

Now is the time to be on the alert for the developing symptoms of root and stalk rot in corn.. The disease can be caused by several different soil-borne fungi, but the most common and destructive pathogen in the western part of the corn belt is *Fusarium moniliforme.*

The disease normally begins several weeks after silking and becomes progressively severe as the crop matures. The fungus attacks through the roots, causing their breakdown and decay, and then advances into the crown and lower internodes of the stalk. The disease is first seen when plants begin to exhibit typical moisture deficiency symptoms — leaves that turn gray-green and dull in color, death of tissue along leaf margins or progressing from the tip downward, etc. When leaf sheaths are pulled from the lower portions of the stalk, the internodes are straw-colored (instead of being the normal greenish-white color) and may be spongy and easily crushed. Shortly thereafter entire plants may die rather suddenly. If lower stalks are split lengthwise, the interior tissues (the pith) may be disintegrating into large, lens-shaped cavities with only the vascular elements remaining intact. Whitish-pink or salmon-colored fungal mycelium can sometimes be seen growing on the cavity walls or among the vascular bundles.

Frequent rains and warm, wet weather after silking seem to favor the onset and development of Fusarium root and stalk rot. High plant populations and loss of leaf area through foliar diseases, hail, or insect damage further predispose plants to the infection and decay process.

The disease usually appears in the earlier maturing hybrids first, probably as a function of aging plant tissues more than anything else. Hence, it would be a good idea to monitor your fields closely for evidence of root and stalk rot development and prepare to harvest those fields exhibiting the highest incidence of disease as soon as kernel moisture and weather permit.

David S. Wysong
Extension Plant Pathologist
Lincoln

Insect guides

(Continued from page 5)

we may need to use those dollars for other priorities.

If you have already discarded your 1992 Guides or if you never purchased them this year, contact your local University of Nebraska Extension Office and they will be able to provide you with the information that you need.

Steve Danielson
Extension Entomologist, Lincoln