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INSECT, PLANT DISEASE, & WEED SCIENCE NEWS [No. 92-19] [Sept. 4, 1992]

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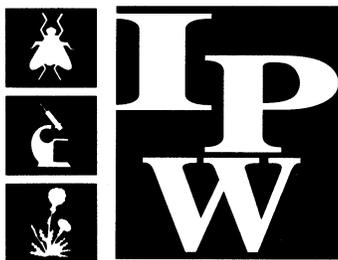
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Weighing the odds

Estimating corn maturity, possible frost dates

Continued cool temperatures have slowed corn development throughout Nebraska. Predictions of an early frost have many farmers regularly checking their hybrids to evaluate stage of growth and whether their crop will mature.

The information presented in *Table 1* is useful in estimating corn physiological maturity based on growth stage. However, there are two limitations with these kinds of data. First, some estimation is necessary to determine where a hybrid of a specific maturity fits. We could probably assume it

would take an early hybrid 20 days from beginning dent to mature while a late hybrid would take 23 days. Secondly, these data are based on normal growing seasons. This has not been a normal growing season! Figures in last week's *IPW News* (92-18) show that we are 12 to 26 days behind normal accumulated Growing Degree Days (GDD) in Nebraska. (Growing degree days are correlated with corn growth rates and are calculated by subtracting 50° from the average daily temperature, F°.) This has been the second coldest year on record!

Another approach to determine approximate date of maturity based on current growth stage is shown in *Table 2*. It shows the growing degree days required for corn of different maturities and stages to reach maturity. It also shows an estimated date of maturity based on average growing degree days accumulated from Aug. 30 through October for south central Nebraska. A full-season hybrid at the beginning dent stage on Aug. 30 would normally mature on Sept. 28. In order for a medium- or full-season hybrid in

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Plant Disease

Unusual weather optimal for uncommon soybean disease

A soybean disease uncommon in Nebraska has appeared in several east central and northeastern counties in the last few weeks. Why the higher incidence this year than in previous years? It is probably due to this summer's unusual weather patterns. *Sclerotinia stem rot*, a fungus disease, can occur when cool and wet conditions occur during flowering periods.

Infections by the fungus, *Sclerotinia sclerotiorum*, occur during full bloom and beginning pod formation if there is high humidity and cool temperatures. Narrow rows, drilling of soybeans, and tall plants or rank growth favor disease development. Any condition that allows the build up of humidity within the canopy will

(Continued on page 2)



Soybean disease *(Continued from page 1)*

favor this pathogen when combined with cool temperatures. If dry or hot conditions prevail, infections are greatly limited and disease losses are minimal or non-existent.

Disease symptoms are chlorosis, wilting, and plant death, which means the disease may be mistaken for late season *Phytophthora* root rot or other stem rots or cankers. Leaves on infected plants become grayish green as necrosis begins, and later turn brown and die. Clusters of infected plants are usually more common than single, scattered occurrences. Examine lower stems for infection sites at stem nodes usually about 6 to 8 inches above the soil line. Initially, water-soaked lesions develop at nodes, changing to tan or white as they mature and girdle the stem, thus inhibiting the movement of water and nutrients to the upper foliage. As the disease progresses, a white mass of moldy growth commonly develops on the outer stem surface. Large, black, round to irregularly shaped sclerotia (a survival structure produced by the fungus) form in the dense white mycelium and in the stem pith. These symptoms, which are conspicuous only when the stem is cut lengthwise, distinguish this disease from other stem and root diseases of soybeans.

While *Sclerotinia* stem rot is difficult to control, its appearance is infrequent and rarely warrants extraordinary measures. In those fields where the disease has gained a foothold, any cultural practice to promote a drier environment will decrease the potential for stem rot development. Wider rows, shorter soybean varieties that don't tend to lodge, and avoiding excessive irrigation during flowering are examples of such practices.

In order to better understand the extent of this disease problem and situations under which it is occurring, we would like your help. If you are unsure that your problem is *Sclerotinia*, send us some stem samples and the following information. If you know that you have *Sclerotinia*, please send the location, soybean variety, soil type, cropping history of field for the last five years, drill or planter

used, irrigated or dryland and any other information that you have.

Send them to:

Plant Disease Diagnostic Clinic
University of Nebraska
448 Plant Sciences Hall
Lincoln, NE 68583-0722

David S. Wysong
Extension Plant Pathologist
James R. Steadman
Professor, Plant Pathology
Lincoln

Dylox limited to ornamentals, turf

Miles Inc., the manufacturer of Dylox (trichlorfon), plans to cancel all food uses of this insecticide due to reregistration cost. Canceled uses are on alfalfa, beets, blueberries, clover, corn, pumpkins, soybeans, and tomatoes.

The only remaining non-food uses will be on ornamentals and turf. For more information, contact Doyle Cochock, Miles, Inc., phone: (816) 242-2120 or fax: (816) 242-2738.

Shripat Kamble
Ext. Specialist, Lincoln
Pesticide Impact Assessment



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Lisa Brown Jasa, Editor

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Goss's wilt seen in dent, pop corn

Goss's bacterial wilt and blight was identified in several pop and dent corn samples received in the Plant Disease Diagnostic Clinic this week. The widely scattered fields located in several central Nebraska counties had all been subject to moderate or heavy hail, one of the weather factors that promotes incidence of the disease. Fortunately, relatively cool temperatures in August have tended to be unfavorable for disease development except on susceptible germplasm.

The most characteristic symptom of the disease is the dark green to black, discontinuous, water-soaked streaks along the margins and/or at the ends of developing lesions. These water-congested, linear streaks have a greasy appearance. Young lesions are at first gray-green and oblong areas that develop parallel to the veins. As the lesions enlarge, droplets of bacterial exudate may appear on the surface of the diseased tissue. These droplets soon dry, leaving a crystalline

substance that glistens when examined in direct sunlight. On susceptible germplasm, the lesions often grow together and can eventually cause large portions of the leaf to die.

Although Goss's wilt has not been a significant problem for several years, corn growers should remain ever vigilant for its re-appearance and take the necessary steps for its control.

David S. Wysong
Extension Plant Pathologist
Lincoln

Control weeds, volunteer wheat to avoid wheat streak mosaic

A recent survey of wheat stubble fields in southwest Nebraska and part of the southern Panhandle found little early volunteer wheat. This was a surprise since a portion of both areas was hailed in mid-June. Several of the hailed fields were examined last week and revealed a general lack of volunteer wheat. The only volunteer wheat present was in fields that had been tilled during the summer. This late volunteer is not the potential threat for carrying over

the wheat curl mite as is early volunteer.

However, there is an abundance of weeds in many of the stubble fields. Green foxtail and witchgrass were present in almost all stubble fields surveyed. Both are hosts for the wheat curl mite and the wheat streak mosaic virus. Of the two weeds, green foxtail presents the greatest threat to serving as the summer bridge for mites and virus. Due to the size of the broadleaf weeds in these fields,

control at this point would be best accomplished by herbicides rather than tillage.

The weeds in these stubble fields need to be controlled soon. Not only will the foxtail serve as a host for wheat streak mosaic, the heavy weed infestation will use valuable moisture and produce an unlimited source of weed seed.

John E. Watkins
Extension Plant Pathologist
Lincoln

Sorghum sooty stripe identified in 2 counties

The plant disease diagnostic clinic has received a few samples of sooty stripe of sorghum in the last few weeks. The samples were from Saline and Franklin counties. Sooty stripe is generally not an economic threat in Nebraska, but can commonly be found at low levels. In tropical climates this disease seriously reduces sorghum production.

Sooty stripe occurs on sorghum in all stages of development, from seedling to maturity, but in Nebraska it usually appears later

in the season after flowering. Elongate elliptical lesions develop on the leaves with purplish to tan lesion margins, depending on the host cultivar. The mature lesion can be several centimeters long and one to two centimeters wide. As the lesions age, they appear "sooty" as numerous small black overwintering structures of the fungus, called sclerotia, are produced. These superficial sclerotia can easily be rubbed off. The presence of the sclerotia clearly distinguishes this disease from

other sorghum diseases. As the season progresses, lesions may coalesce to form extensive necrotic areas and premature leaf death.

The pathogen survives on or below the soil surface as sclerotia on leaf tissue. This disease affects *Sorghum* spp. only and can survive on some perennial hosts within the genus *Sorghum*. Control this disease through crop rotation or the destruction of infected leaf debris which limits the initial inoculum.

Diane A. Merrell
Extension Assistant
Plant Pathology, Lincoln

Corn maturity

(Continued from page 1)

the dough stage to mature, an abnormally warm September and October would have to occur.

What if the trends we have experienced so far in 1992 continue through October? The far right column in Table 2 shows this based on the fact that GDD accumulations in south central Nebraska since June have averaged 4.7 GDD per day behind normal. Thus, temperatures were 4.7° below normal. Neither full nor medium season hybrids at beginning dent on Aug. 30 would mature. This is a worst case scenario — the chances of these trends continuing are remote.

The figure shows GDD accumulations between Aug. 30 and Nov. 1 for average and -4.7, -2, and +2 GDD/day deviations from average. Normally no GDD units accumulate after Oct. 24; no GDD units accumulate in the -4.7 accumulation curve after Oct. 14. Both of these maturity dates are after the normal date of the first frost for south central Nebraska.

We can hope for above normal temperatures in September and/or a late frost. If it becomes clear that a specific hybrid may not mature, or if it would encounter a high risk of frost before maturity, cutting the crop for silage may be an option. Irrigators who have not applied their last irrigation may also consider not watering hybrids like this in order to speed up crop development. Of course this could reduce yields if we have a late frost. In any case, we may be dealing a lot with frosted corn and the associated lighter test weights and lower germinations.

Roger W. Elmore
Extension Crops Specialist
SCREC, Clay Center

Growing Degree Day Accumulations

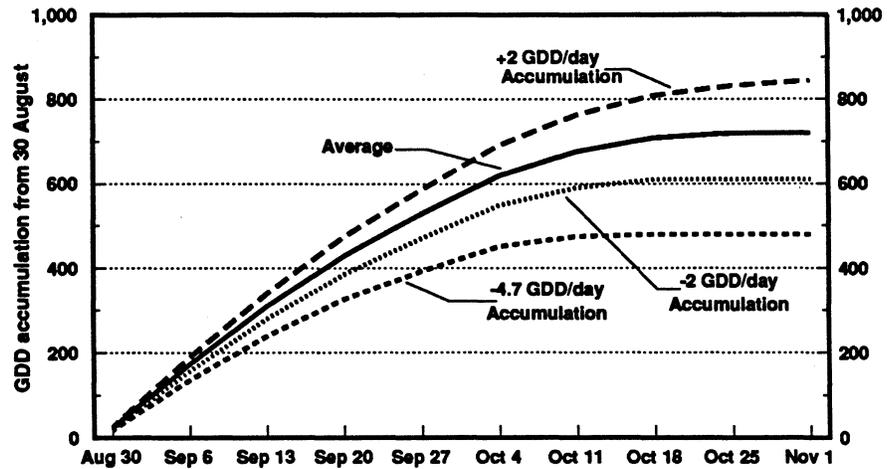


Table 1. Corn growth stage and approximate days to maturity¹

| Growth stage | Approximate calendar days to maturity |
|-------------------------------------|---------------------------------------|
| Blister | 45 - 51 |
| Dough | 31 - 37 |
| Beginning Dent | 20 - 23 |
| Physiological Maturity ² | 0 |

¹ Source: *How a Corn Plant Develops*, Special Report No. 48. Iowa State University

² Black layer

Copsol food uses canceled

Chemical Specialties, Inc. plans to cancel all food uses of its fungicide, Copsol. The determining factor was the reregistration cost. Canceled uses will be on: beans, carrots, celery, citrus, cucurbits, grapes, peppers, potatoes, strawberries, sugar beets and tomatoes.

The only remaining uses will be on wood and burlap. For more information, contact: Fred Omundson, Chemical Specialties, Inc., phone: (704) 522-0825, or fax: (704) 522-8232.

Shripat Kamble
Extension Specialist, Lincoln
Pesticide Impact Assessment

Corn maturity *(Continued from page 4)*

Table 2. Growing Degree Day (GDD) requirements for various stages of growth and estimated dates of physiological maturity for different hybrids.

| Hybrid/Maturity Growth Stage | Cumulative GDD ¹ | Additional GDD to physiological maturity | Date of Physiological Maturity ² | |
|------------------------------------|--------------------------------|---|--|---|
| | | | Average Month/day | -4.7 GDD/day Accumulation Month/day |
| EARLY (100-105 day hybrids) | | | | |
| Blister | 1502 | 953 | * | * |
| Dough | 1740 | 715 | 10/22 | * |
| Beginning Dent | 1979 | 476 | 9/24 | 10/12 |
| Full Dent | 2217 | 238 | 9/10 | 9/13 |
| Physiological Maturity | 2455 | 0 | 8/30 | 8/30 |
| MEDIUM (110 day hybrids) | | | | |
| Blister | 1661 | 1052 | * | * |
| Dough | 1924 | 789 | * | * |
| Beginning Dent | 2187 | 526 | 9/27 | * |
| Full Dent | 2450 | 263 | 9/11 | 9/15 |
| Physiological Maturity | 2713 | 0 | 8/30 | 8/30 |
| FULL (115 day hybrids) | | | | |
| Blister | 1700 | 1081 | * | * |
| Dough | 1970 | 811 | * | * |
| Beginning Dent | 2240 | 541 | 9/28 | * |
| Full Dent | 2511 | 270 | 9/11 | 9/16 |
| Physiological Maturity | 2781 | 0 | 8/30 | 8/30 |

¹Cumulative growing degree days from planting are from R.E. Neild and M. W. Seeley, 1977, Research Bulletin 280. Agricultural Experiment Station, University of Nebraska.

²These dates are for south central Nebraska. See text for description.

*These hybrids at these growth stages will not mature.

Clean, prepare bins to protect your investment

With harvest rapidly approaching, now is the time to prepare grain bins and harvesting equipment to help ensure that grain going into storage will remain in good condition. Don't wait until the middle of harvest to discover that a bin foundation is severely cracked, or find even later that insects from grain that was left in the combine last fall have severely infested a bin of new grain. Regardless of whether this year's weather results in a bumper crop or reduced-quality grain due to an early frost, proper bin and equipment preparation is a key to preserving stored grain quality.

Harvesting equipment

Remove all traces of old grain from combines, truck beds, grain carts, augers, and any other equipment used for harvesting, transporting, and handling grain. Even small amounts of moldy or insect-infested grain left in equipment can contaminate a bin of new grain.

Adjust combines according to the manufacturer's specifications to minimize grain damage and to maximize removal of fines and other foreign material. Equip combines with a straw spreader or chopper to avoid leaving windrows of residue that can interfere with subsequent tillage and/or planting operations. Particularly when harvesting soybeans or small grains with an extra-wide header (greater than about 20 feet), a chaff spreader may also be needed for more uniform residue distribution. Be sure that all guards and shields are in place and in good working order.

Bins and other components

Check the bin site, and remove any items or debris that would interfere with safe, unobstructed movement around the bin. Remove any spilled grain and mow the site to reduce the chances of insect or rodent infestation. If necessary, re-grade the site so that water readily drains away from bin foundations.

Inspect bins and foundations for structural problems. Uneven settlement of foundations can cause gaps between the foundation and bottom edge of the bin. This can result in grain spills and provide entry points for water, insects, and rodents. If perforated floors are used, a gap between the foundation and bin will allow air that would normally be forced through the grain to escape from the bin. Small gaps can usually be filled with a high quality caulking compound. If deterioration is extensive, the mastic seal may need to be replaced. Be sure all anchor bolts are tight and undamaged.

Inspect the bin roof and side, inside and out, for leaks, loose or sheared bolts, rust or other corrosion. Check the roof vents and access hatch, and caulk any cracks at the roofline. Be sure the access ladder is complete and securely fastened to the bin. Repair or replace any deteriorated components.

Wiring for fans and other electrical components should be inspected for corrosion and cracked, frayed, or broken insulation. Exposed wiring should be run through waterproof, dust-tight conduit. Avoid kinking the conduit, and make sure all connections are secure.

Check fans, heaters, transitions, and ducts for corrosion, and remove any accumulated dust and dirt that will reduce the operating efficiency. All connections should be tight.

Next, ensure that the bins are clean. Remove old grain with brooms and vacuum cleaners. Never put new grain on top of old. Also, clean bins not being used for storage this year to keep insects from migrating to other bins.

It is generally impossible to thoroughly clean under perforated drying floors. Remove as much of the debris as possible, then fumigate the empty bin with chloropicrin. (Chloropicrin is a *Restricted Use Pesticide* and requires gas monitoring devices and respirator protection.)

At least two weeks before adding grain, spray all interior surfaces of the cleaned bin with premium grade malathion, methoxychlor, or Reldan (sorghum only). Spray all surfaces to the point of runoff and force spray into cracks and seams. Follow product label instructions for dilution and application directions. *Note:* Do not spray bins where soybeans will be stored. Stored soybeans rarely experience insect problems and few insecticides are labeled for use on soybeans.

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

David P. Shelton
Extension Agricultural Engineer
NEREC, Concord
David D. Jones
Assistant Professor
Biological Systems Engineering
Lincoln

Weed Science

Control downy brome before planting wheat

Downy brome is a self-pollinated winter annual grass reproducing solely from seed. Known by a variety of names such as cheatgrass, military grass, wild oats, mormon oats or junegrass, downy brome is a constant threat to winter wheat. This is largely due to the common life cycles that downy brome and winter wheat have. Last summer's increased rains will promote rapid germination and lush fall growth of downy brome this fall, which will coincide with winter wheat seeding.

Downy brome survives from year to year as viable seed in litter on the soil surface or buried in the soil. Seed viability, longevity, germination and seedling emergence are crucial to the perpetuation of the species. Potentially, seed production can be 300 or more seeds per plant. Seed can remain viable in the soil for more than two years so eliminating the seeds is essential for control. The best defenses against downy brome are tillage and the use of spring seeded crops in a rotation. Studies have shown that downy brome cannot germinate and establish on bare soil. Tillage "plants" downy brome seed, making it easier to control with later tillage operations.

Delaying winter wheat seeding until the correct planting date will allow fall germinated seedlings of downy brome to emerge and be destroyed by tillage prior to seeding. Monitor seedbeds prior to winter wheat seeding for downy brome infestations. A second tillage operation one to two weeks after primary tillage is often

necessary to destroy downy brome seedlings which may have been missed the first time.

Herbicidal control of downy brome in winter wheat offers limited success since products such as Treflan or Far-Go 10G provide only a 50% to 80% control. These herbicides must be used preplant incorporated and will not control emerged downy brome. With Far-Go the wheat must be planted with a hoe drill which places the wheat seed below the herbicide zone. There are a number of other herbicides such as Atrazine or Oust that can be used for downy brome control, but they are to be used only in non-cropland areas.

Planting sorghum, corn, oats, or millet in a winter wheat cropping sequence will reduce downy brome populations because these crops have different life cycles than that of winter wheat and downy brome. In non-cropland areas, downy brome can be controlled with seedings of perennial cool season grasses and legumes. These seedings will tend to "out-compete" the downy brome once they are well established.

Alex Martin
Extension Weeds Specialist
John McNamara
Extension Assistant
Lincoln

Producers: Be leery of telephone herbicide sales

Our office has been alerted to over-the-telephone herbicide sales that have been occurring in some parts of the state. The herbicides in question are often not registered for sale within the state and are being sold by little known companies. The herbicides are usually "watered down" versions of 2,4-D and dicamba (Banvel) combinations to be used as a broadleaf/brush herbicide.

Do not be fooled. These products often are overpriced and weak in performance due to the low concentration of

active ingredients. Ask for a label of the product being sold. This will contain all active ingredients involved in the herbicide formulation. A company with a legitimate product will give you this information without reservation. Your local chemical dealer is often the best source for herbicides because it values and wants your return business.

Alex Martin
Extensions Weeds Specialist
John McNamara
Extension Assistant
Lincoln

Insect Science

Cultural practices key to controlling Hessian flies

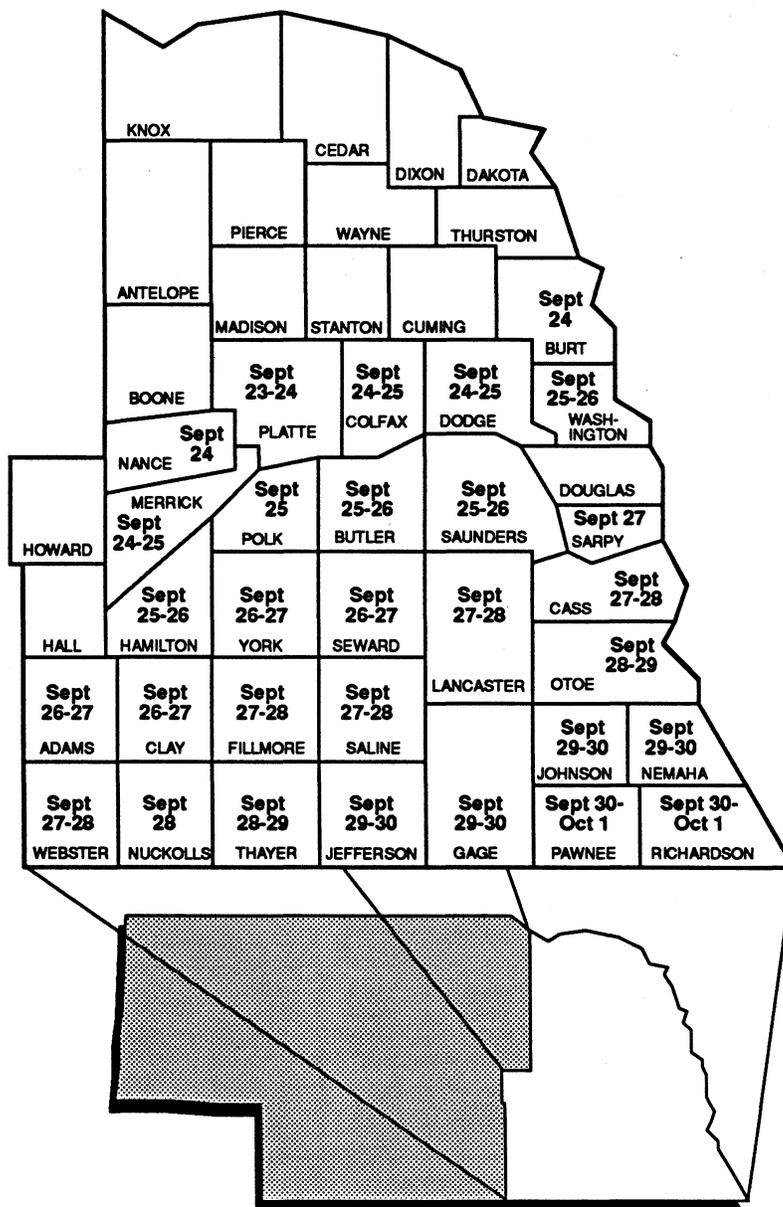
Now's the time to begin battling the Hessian fly with preventive measures. Generally, chemical controls are not a practical solution, so cultural practices are the only means to prevent serious losses. To reduce Hessian fly fall infestations:

1. Control volunteer wheat before planting.
2. Plant resistant or tolerant wheat varieties.
3. Plant after the fly-safe date (see map).

This is not an average year for temperatures, so it is even more important than ever that growers not rely solely on following the fly-safe planting dates, but rather should incorporate two or all three practices into their management program.

The Hessian fly spends the summer in the flaxseed stage on wheat stubble. In the fall, adults emerge to deposit eggs on early-seeded or volunteer wheat. Plowing will bury many flaxseeds deep enough to prevent adults from reaching the surface, but such a practice may not be wise from an erosion standpoint. Planting after the fly-safe date allows seedlings to emerge after most adult flies have died. Fly-safe dates are averages based on several years of observations. A hot, dry September can delay fly emergence. Moist, cool weather, such as we've had this year, may cause average emergence dates to be earlier than the averages indicated on the map. Fly-safe dates have not been developed for western Nebraska, however, planting before mid-September is not recommended.

Producers who wish to plant early should strongly consider planting resistant varieties. Varietal resistance to the Hessian fly does not guarantee immunity, but should reduce the probability of severe infestations. Among the Hessian fly resistant varieties



Fly-safe planting dates for eastern Nebraska for a year with average temperatures. Actual fly-safe dates may be earlier than normal if the cool, wet climate continues.

available for planting are:

Resistant — Arkan, Brule, Redland, Larken, 2163, and Norkan;

Moderately Resistant — Arapahoe, Buckskin, Century, Colt, Mesa, Rawhide, and Wings.

Please be careful when choosing wheat varieties because many popular varieties, such as Karl, Thunderbird, Abilene, Scout 66, Siouxland, Centura, and the TAM #'s, are susceptible to Hessian flies.

Steve Danielson, Jack Campbell, and Gary Hein
Extension Entomologists