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Discolored wheat heads and shriveled grain can signal late disease development

In Nebraska Septoria leaf and glume blotch, black chaff and scab are the primary diseases responsible for discolored wheat heads and shriveled kernels. Although there are subtle differences in the signs and symptoms of the three diseases, they can be difficult to distinguish in the field.

With Septoria leaf and glume blotch, the glumes turn tan to dark brown and have numerous pycnidia in older lesions. Pycnidia are small, raised dot-like structures of the causal fungus that can be seen without any magnification. Grain in infected heads can be shriveled.

The name black chaff comes from the darkened glumes of infected plants. Characteristic symptoms are dark interveinal streaks and blotches on the glumes. These symptoms can be confused with glume blotch and a genetic melanism called pseudoblack chaff. Infected awns show alternating bands of healthy and darkened disease tissue.

Scab causes heads to prematurely ripen and then darken. A way to distinguish scab from glume blotch and black chaff is to note the salmon-orange ring of fungal mycelium at the base of the spikelet or in the crease of the kernel. Grain from blighted heads has a dull, chalky, tombstone-like appearance and may appear pink.

Continued wet, humid weather has created ideal conditions for the development of these three diseases on maturing wheat heads. Grain from affected fields should not be used for seed for this fall’s planting.

One other cause for darkening of mature wheat heads is sooty mold. This malady is caused by the superficial growth of fungi on mature wheat heads. The longer fields remain unharvested because of wet weather, the more likely sooty mold will grow on the heads and cause them to darken. Sooty mold is superficial and will not affect the kernels.

John E. Watkins
Extension Plant Pathologist

Quality wheat seed the basis for a good crop in 2,000

There’s no secret to keeping wheat a consistent performer in your farm operation. It’s a matter of making the right decisions and putting the right management actions to work at the right time. A successful producer takes control of everything possible, including these three key factors:

1. Select and plant at least three complementary varieties, either with a proven record of performance in your fields and in your system or with traits shown to fill in most of the gaps from the potential weaknesses of your workhorse variety (e.g. maturity, straw strength, disease).

2. Rely on high quality certified seed every time for every variety. You know the benefits of good seed. For optimum performance, the NCIA encourages the use of certified quality seed with 90% germination or higher, 99.25% pure seed, no objectionable or noxious weeds, no other crop especially rye or triticale, a systemic seed treatment, a uniform seed size,

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Field updates

Gary Hall, Extension educator in Phelps County: Irrigation is in full swing. The corn crop seems shorter than usual, as many farmers have commented, but overall the corn and beans look very good.

Andy Christiansen, Extension educator in Hamilton County: Applicator airplanes have been flying this week. I assume they are treating for grey leaf spot, because we have few, if any, insect problems, other than potato leaf hoppers in alfalfa.

Paul Hay, Extension educator in Gage County: Now's the time to start on the 2000 corn crop. Wheat stubble kept clean with herbicide treatments provides a great seedbed for southeast Nebraska dryland corn. Use 2,4-D and or Roundup to keep broadleaf weeds and grasses from going to seed in the next few weeks followed by a late August or early September treatment for volunteer wheat.

We've had wheat yields in the 45-55 bushel range with good test weights. Oats are coming in at 85-95 bushels per acre with near 32 lb. test weight, which is excellent for southeast Nebraska. At $1.35 to $1.45 a bushel at the local feed mills, oats are soing as well as wheat.

Randy Pryor, Extension educator in Saline County: Wheat harvest is 70% complete, although it was slowed slightly by weekend rains. Wheat yields have been in the 40 to 52 bushel per acre range. Test weights have dropped due to harvest weather conditions, but quality has been good. I've receive one isolated report of chinch bug damage near Tobias on five to six acres of milo surrounded by pasture and native grasses where they likely overwintered.

Irrigation in the Dorchester and Friend areas is beginning for the first time this year. Fields are being sprayed when wind and soil conditions allow for post emergence weed control.

Some farmers are now using the 1 1/2 qt per acre rate on tall weeds in Roundup Ready fields. Area commercial applicators are beginning to catch up on postemergence spraying in milo and soybean fields. The second cutting of alfalfa was tremendous with excellent yields and quality.

Ray Weed, Extension educator in Kimball and Banner counties: Wheat harvest began here the middle of last week. A few fields on lower elevation, sandy soils in the Pumpkin Creek and Lodgepole Creek drainage areas, were cut first.

There was up to .25" of rain (with some hail) along the Colorado stateline Sunday evening, benefitting dryland corn, proso millet, and sunflowers, but delaying wheat maturity by a few days. Some custom cutters are here now and more are expected any day. With this week's warmer temperatures, wheat harvested is expected to go into full swing here next week.

Sunflowers and proso millet planted after the hail two weeks ago emerged and is growing rapidly with good soil moisture and high heat units.
Wheat seed  (Continued from page 157)

and test weight of no less than 57 lbs/bu.

3. Build a sound business relationship with a reliable seed supplier. There is a wide choice of wheat seed enterprises in Nebraska to meet your needs for service, quality and value. Early in the season begin talking about with your seed representative about your expectations. If you wait until the last minute, your top choices may be gone.

These three controllable production keys are very closely linked in delivering performance (a.k.a. yield). For example, if the seed supplier doesn’t try to understand your special production needs, or the variety is not well suited to the growing conditions or the seed quality just doesn’t measure up, yield will suffer, maybe a little and maybe a lot. All it takes is control.

And information. That is the driving force behind the ability to make the right decision — access to timely, useful information.

Later this month the Nebraska Crop Improvement Association will publish and distribute free its 77th annual edition of the Nebraska Certified Quality Wheat Seed Book. It will be available by direct mail to most wheat producers, or from nearby Cooperative Extension offices, or from NCIA exhibits at the Nebraska State Fair and Husker Harvest Days. Free subscriptions are available by calling the NCIA office at 402-472-1444.

The Seed Book lists all wheat and cool season forage grass varieties that were enrolled in the Nebraska seed certification program in 1999. The varieties are listed with a brief description and the names, addresses, phone numbers, and acres being grown by seed producers. The list also includes producers who have carryover seed from previous years.

Two other special features are a variety comparison chart in the center of the book and a list of wheat varieties by family, both which are useful in matching complementary varieties.

Seed supply

The supply of high value, high quality certified seed should be very adequate except for a few of the newest varieties. Weather, disease and/or demand may cause local shortages of some varieties. There were 29 hard red winter varieties grown for seed with two more available as carryover seed only. Total seed acres applied for were 11,097, however not all fields met inspection standards.

The top ten varieties for seed acres

<table>
<thead>
<tr>
<th>Variety</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>2137</td>
<td>2079</td>
</tr>
<tr>
<td>Arapahoe</td>
<td>1804</td>
</tr>
<tr>
<td>Alliance</td>
<td>1587</td>
</tr>
<tr>
<td>Pronghorn</td>
<td>1360</td>
</tr>
<tr>
<td>Niobrara</td>
<td>793</td>
</tr>
<tr>
<td>Culver</td>
<td>640</td>
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<tr>
<td>Vista</td>
<td>538</td>
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<tr>
<td>Windstar</td>
<td>465</td>
</tr>
<tr>
<td>Wesley</td>
<td>272</td>
</tr>
<tr>
<td>Karl 92</td>
<td>243</td>
</tr>
</tbody>
</table>

Total seed acres are about 2,000 below last year, and 3,000 below the five-year average. Excellent yield and seed quality in the 1998 crop did allow many seed producers to reduce their reliance on the current year. The 1999 seed will be supplemented with over 60,000 bushels of carryover seed, over half of which is Arapahoe and Niobrara.

Seed quality

Only a very few certifiable seedlots have been submitted for testing as of mid-July. Harvest is just getting well underway in the Nebraska Panhandle where a significant portion of Nebraska seed is grown. Reports from the NCIA field service staff and seed producers indicate that seed quality should be above average in most of the state. Overall low weed and disease pressure, moderate temperatures during grain fill, adequate soil moisture and other growing conditions were quite favorable to wheat. Above average yields will allow seed conditioners to aggressively select and size seed. Seed size will vary widely from seed lot to seed lot even within the same variety and production area. The cool, wet weather also has resulted in eastern Nebraska seed of susceptible varieties showing some fusarium head scab and glume blotch. If present, the impact on quality (e.g. germination, test weight) from these factors can be effectively muted thorough seed conditioning and use of systemic seed treatments.

The only thing you can ever be sure about seed quality is that you can never tell quality just by looking. Seed quality is truly more than meets the eye. It’s important to know that you don’t have to rely on what you see or just what somebody says to be sure about the seed you plant. No matter where it comes from or who sells it, Certified Quality Seed is not certified quality without the official label that serves as your proof it met or exceeded every standard.

New varieties

Three varieties will be available for the first time this fall as Nebraska Certified Quality Seed: Culver and Wesley are from the Nebraska program and Hondo is from Agripro. All three are in limited supply, with Wesley and Hondo expected to quickly sell out. Descriptions of each variety taken from the Nebraska Seed Book follow:

- Culver — Culver is a medium maturing, medium height variety best adapted to south central and southwest Nebraska and similar dryland wheat production areas in

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Wheat seed (Continued from page 159)

adjacent states. It was tested under the designation NE93554. Culver is a shorter Arapahoe, 2 to 3 inches shorter, with higher yield, similar maturity and other agronomic/end-use traits, but is susceptible to Hessian fly. Its performance in western Nebraska has been equal to Arapahoe. It has fair to good winter hardiness, medium length coleoptile, very good tillering ability, and moderately strong straw. Culver was developed by Nebraska and the USDA-ARS from the cross of NE82419/Arapahoe which includes parentage from Trapper, Scout, Buckskin, Homestead and others. Application for U.S. Plant Variety Protection is anticipated permitting the sale of seed only when achieving Certified Quality status.

- Hondo (PVP AgriPro brand) — Hondo is a moderately early maturing, moderately short height variety with excellent straw strength. It was tested as W95-210. It has average or above average protection to most common diseases attacking wheat including powdery mildew and fusarium head scab. It has good winter hardiness, medium coleoptile length, and acceptable milling/baking qualities. Hondo is genetically diverse and includes parentage from Mesa, Sturdy, Hawk, Wings, Centurk and other adapted experimental lines. It was developed, produced and marketed exclusively under the AgriPro Wheat brand. U.S. Plant Variety Protection has been applied for. Unauthorized sale of seed is illegal.

Wesley — Wesley is a moderately early maturing, moderately short height variety with excellent straw strength. It was tested as N95L158. It is bronze chaffed similar in color to Jagger. Compared to 2137, it has similar adaptation and yield on optimum production soils and sites in the central and northern Great Plains. Wesley is more winter hardy, is about two days later heading, slightly shorter, with similar protein and test weight patterns and a lower level of protection to some foliar diseases. It is genetically complementary to most varieties being grown in Nebraska.

It was derived from the cross Sumner sib (Plainsman V/Odesskaya 51)/Colt/Cody. Wesley was developed by the USDA-ARS in cooperation with Nebraska and co-released by those institutions with South Dakota. Application for U.S. Plant Variety Protection is anticipated permitting the sale of seed only when achieving Certified Quality status.

Roger Hammons, manager
Nebraska Crop Improvement Association

Patience due for hard white wheat seed

Producers who are anxious to jump on the hard white wheat wagon must be aware that it will be likely be next fall (2000) before seed of Betty, Heyne or Nuplains will be available for grain production and maybe not even then.

Crop Watch readers already know that Nuplains hard white winter wheat was developed by Nebraska (see May 21 issue). This August a final decision will be made on the release and process of commercialization for the variety. But before the seed is generally available to producers for identity preserved grain production, the seed supply must be further increased during the 1999-2000 and 2000-2001 growing seasons. It is expected that due to the very limited supply of Nuplains, only six to eight qualified seed specialists of the Nebraska Crop Improvement Association will receive allocations this fall to produce registered seed.

There is a long list of required "Do's" and "Don'ts" to successful HWW seed production, in addition to the usual steps in certification of varietal identity and seed quality. Eventually there will be enough seed for every farmer that wants it, but not this year.

In the fall of 1998, Kansas State Agricultural Research Division released Foundation seed of Betty and Heyne to a select group of seed enterprises producing registered seed. As of July 5, those Kansas seed growers intended to put most, if not all, of that registered seed back into the ground and produce certified quality seed for general distribution in the fall of 2000. In the event some seed of either or both of these varieties is marketed this fall, it may be very expensive.

Other hard white wheat varieties are available, but there may be limitations due to variety adaptation and contractual requirements. You may hear of varieties such as Nuwest which is contracted to General Mills, or Platte which has been grown successfully in Nebraska under contract to ConAgra. The American White Wheat Producers Association (AWWPA) is a closed cooperative which has many varieties to choose from including Arlin, Río Blanco, and Oro Blanco.

For the latest on hard white wheat challenges and opportunities, visit the Nebraska Hard White Wheat 2000 website at http://ianrwww.unl.edu/ianr/phrec/hww.htm. Study the yield performance, adaptation, and end-use market requirements for each variety carefully to see if it fits your operation.

Roger Hammons
Manager of the Nebraska Crop Improvement Association
Scout now for corn rootworm beetles; use counts to plan ‘00 treatment

Western corn rootworm beetles began emerging in early July in south central Nebraska. I anticipate that areas with high beetle numbers last year will also experience high numbers this year, since the winter weather was not severe enough to reduce overwintering egg survival to a great degree.

Beetles emerging before silk emergence may feed on corn leaves. They feed by scraping the surface tissue, leaving a white parchment-like appearance. Once silks emerge this is the favored food. There are no thresholds for silk-clipping damage based on beetle numbers, because damage levels are not correlated well with beetle densities. Usually an average of at least 10 beetles per ear are required to seriously affect pollination. Severe silk feeding at 25-50% pollen shed may indicate the need to apply an insecticide, especially in seed production fields.

During late July and August these beetles will be laying eggs in corn fields. These eggs overwinter in the soil, hatch into rootworms in the spring, and feed on corn roots if continuous corn is grown. However, not all continuous corn fields have economic infestations of corn rootworms. Weekly scouting of adult rootworm beetles in July and August will provide you with information to make a decision whether or not a rootworm insecticide is needed next year. People using adult beetle control programs should base the decision to treat and spray timing on information from field scouting.

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

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

In addition to visual scouting methods for rootworm beetles, yellow sticky traps may be used. Research conducted in Iowa identified an unbaited Phercon AM trap as the best trap among several tested. Attach traps to the corn plant at ear height and leave in the field for a week. Use 12 traps per field, spread out over the whole field. If beetle counts exceed an average of 6 beetles per trap per day, this is equal to the treatment threshold. If beetle counts are below this level, continue sampling until the threshold is exceeded or beetle activity stops. Some advantages of using traps over visual examination include:

1) traps catch beetles over several days and average out variation due to time of day or weather; and
2) counts are not influenced by the experience or skill of the sampler.

Traps are available from the manufacturer, Trece (408-758-0204), or from Great Lakes IPM (517-268-5693) or Gemplers (800-382-8473) and cost about $1 per trap.

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

Individuals using adult beetle control programs should begin treatments when the beetle threshold is exceeded and 10% of the female beetles are gravid (abdomen visibly distended with eggs). This is an important point since the first beetles to emerge are mostly male, and females require at least 10-14 days of feeding before they are able to lay eggs. Treatments applied too

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Beetle scouting (Continued from page 161)

Early may be ineffective if large numbers of females emerge after the treatment has dissipated. Continue to monitor fields weekly after treatment for rootworm beetles. If beetle numbers exceed 0.5 beetles per plant, retreatment is warranted. Late maturing fields are particularly susceptible to corn rootworms moving into them from nearby earlier maturing fields. A complete discussion of adult corn rootworm management can be found in UNL Misc. Publ. 63, *Adult Corn Rootworm Management*, by UNL Entomologist Lance Meinke.

Be aware that reduced adult rootworm control with foliar insecticides due to insecticide resistance has been documented in the Holdredge and York areas (see NebFact 99-367, *Adult western corn rootworm insecticide resistance in Nebraska*). If you experience poor control with repeated applications of foliar insecticides, and high numbers of beetles are still present, it may be better to consider rotating that field out of corn next year rather than continuing to treat for corn rootworm beetles.

Rates and restrictions of registered insecticides for adult corn rootworm control can be found on the label or at the UNL Entomology Home Page at [http://www.ianr.unl.edu/ianr/entomol/fldcrops/fldcrops.htm](http://www.ianr.unl.edu/ianr/entomol/fldcrops/fldcrops.htm)

**Crop update**

Corn conditions rated 1% very poor, 2% poor, 14% fair, 60% good, and 23% excellent. Dryland corn rated 87% and irrigated corn rated 81% in good or excellent conditions. Corn silked was at 3%. European corn borer infestation in some fields were noted to need treatment.

Soybean conditions were rated 1% poor, 17% fair, 67% good, and 15% excellent.

Sorghum headed was at 3%, just above last year and average. Sorghum condition rated 1% poor, 21% fair, 67% good, and 11% excellent.

Dry bean blooming was at 3%, just above last year’s 2%, but below 8% average. Dry bean conditions rated 1% very poor, 1% poor, 25% fair, 72% good and 1% excellent.

Winter wheat conditions were 6% very poor, 5% poor, 21% fair, 50% good, and 18% excellent. Wheat ripe was at 51%, below 67% last year and 57% average. Wheat harvest progressed with the good weather conditions.

Alfalfa condition rated 1% very poor, 1% poor, 17% fair, 69% good and 12% excellent. Alfalfa second cutting rated 47%, above last year’s 32% and 30% average. Leaf hoppers were the main problem in alfalfa. Wild hay conditions were rated at 1% very poor, 2% poor, 9% fair, 70% good, and 18% excellent.

<table>
<thead>
<tr>
<th>Plants per acre</th>
<th>Average number of rootworm beetles</th>
<th>First year corn**</th>
<th>Continuous corn*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per plant</td>
<td>Per ear zone</td>
<td>Per plant</td>
</tr>
<tr>
<td>14,000</td>
<td>1.28</td>
<td>0.64</td>
<td>0.96</td>
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<tr>
<td>16,000</td>
<td>1.12</td>
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<td>0.84</td>
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<tr>
<td>18,000</td>
<td>1.00</td>
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<td>0.75</td>
</tr>
<tr>
<td>20,000</td>
<td>0.90</td>
<td>0.45</td>
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</tr>
<tr>
<td>22,000</td>
<td>0.81</td>
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<td>24,000</td>
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<tr>
<td>32,000</td>
<td>0.56</td>
<td>0.28</td>
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</tr>
</tbody>
</table>

*Based on a 50:50 ratio of females to males.
**Based on a 70:30 ratio of females to males.
***Use this threshold for continuous corn fields that did not have larval populations earlier in the season (adult beetles are immigrants, similar to first year corn).

Alfalfa condition rated 1% very poor, 1% poor, 17% fair, 69% good and 12% excellent. Leaf hoppers were the main problem in alfalfa. Wild hay conditions were rated at 1% very poor, 2% poor, 9% fair, 70% good, and 18% excellent.

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Nebraska Agricultural Statistics Service

Plant and Pest Diagnostic Clinic

Corn diseases diagnosed in the last two weeks were Stewart’s wilt, bacterial stalk rot, pythium crown and root rot, fusarium crown and root rot, Anthracnose leaf blight, Brome mosaic virus, smut, and Holcus leaf spot.

Soybean diseases included Pythium, Rhizoctonia, and Fusarium root rots causing damping off and cortical rot, and brown spot. Alfalfa diseases included Fusarium crown and root rot. Sorghum damping off caused by Fusarium and Rhizoctonia also were diagnosed.

Loren J. Giesler
Plant and Pest Diagnostic Clinic Coordinator
Assessing herbicide success post harvest

In late August and September 1998, 179 Nebraska wheat stubble fields were surveyed to identify factors affecting the performance of post-harvest herbicides. Eighty-nine weed species were identified. Data was collected from sites in Adams, Box Butte, Cheyenne, Custer, Deuel, Franklin, Frontier, Furnas, Gage, Garden, Gosper, Harlan, Hayes, Jefferson, Johnson, Keith, Lincoln, Logan, Morrill, Nuckolls, Perkins, Red Willow, Saline, Thayer, and Webster counties.

Seventy percent of the winter wheat stubble fields were rated excellent for weed control with an average stubble quality score of 86%. Nineteen percent of the fields rated unacceptable poor to fair for weed control. The only fields that had acceptable stubble quality were fields that scored more than 90% visual weed control. This indicated that weed control was tied closely to stubble quality and weed size. Generally, weeds in fields with thin or short stubble were cut off with the combine during harvest and were more difficult to control with herbicides. This was especially noticeable for broadleaf weeds on treatments that did not include 2,4-D in the herbicide mixture. In some fields, however, insufficient 2,4-D (3 to 6 oz/A) was included in the mixture.

Sprayers. Degree of weed control could not be related to nozzle spacing, tip size or type, boom height, spray volume, pressure, speed, sprayer, time of day sprayed, or surfactant.

Herbicides. Glyphosate was applied to 65%, Gramoxone Extra to 23%, and Touchdown 5 to 10% of the fields. Atrazine was used on 56% of the fields during the first application in 1998. Atrazine was combined with glyphosate on 28% of the fields, with Gramoxone Extra on 23%, with 2,4-D on 3%, and Touchdown 5 on 2%. In 1998, 12% of the growers had used the two-spray program. Others had not yet applied atrazine at the second application, while some growers were delaying application in order to keep their cropping options open for 1999.

Application rates varied:
- Glyphosate, 12-64 oz/A; 2,4-D, 3-24 oz/A; atrazine, 0.5-3 lb/A, Gramoxone Extra, 12-32 oz/A, dicamba, 2 to 8 oz/A, FallowMaster, 42-64 oz/A, Touchdown 5, 19-25.6 oz/A, and Landmaster BW, 32-84 oz/A. Second application rates ranged from 10 to 24 oz/A of glyphosate; the high rate was used where rain occurred before glyphosate was rainfast. Success with low herbicide rates varied depending upon weed species and size. For instance, in one field applying glyphosate plus

Control minor weeds before they become problems in future crops. Toothed and spotted spurge, Pennsylvania smartweed, common milkweed, prairie cupgrass, and yellow nutsedge may become problem weeds if better control measures are not found.

volunteer wheat, stinkgrass, and witchgrass are major weeds. Applicators tend to wait too long before committing the Gramoxone Extra plus atrazine treatment.

Effects of herbicides on grass weeds

Glyphosate treatments. Weed control with glyphosate alone or with 2,4-D or atrazine varied from 49% to 100%. Using glyphosate alone controlled all weed species but when mixed with 2,4-D or atrazine control diminished on some species. Control of large crabgrass, barnyardgrass, fall panicum, and yellow foxtail was less when 2,4-D or atrazine was combined with glyphosate. This was most likely caused by antagonism. Glyphosate did not control prairie cupgrass and perennial weeds at the rates used.

Touchdown 5 plus 2,4-D or atrazine. Large crabgrass (81% control) was the only weed that Touchdown 5 did not control 98-100%. The success with Touchdown 5 may be due to more timely application.

Density was an important factor in control of some species. Large crabgrass treated with glyphosate at 32 oz/ (Continued on page 164)
A controlled 100% at 40 plants/m², 40% at 280, and 0% at 560 plants/m². In another field infested with longspine sandbur treated with glyphosate plus atrazine plus 2,4-D at 20 oz + 2 qt + 1 pt/A, respectively, control was 42% at 37 plants/m² and 0% at 120 plants/m². In another field infested with longspine sandbur glyphosate plus atrazine plus atrazine plus atrazine (Landmaster BW) at 2 + 2 qt/A controlled longspine sandbur 88% when density was 400 plants/m² and 0% when density was 1,500 plants/m². For yellow foxtail, control with Landmaster BW plus atrazine at 2 + 2 qt/A was 100% at 12 plants/m² and 0 at 344 plants/m².

**Effect of herbicides on broadleaf weeds**

Most summer annual broadleaf weeds were controlled with the herbicide treatments used following wheat harvest. None of the herbicides controlled groundcherry spp. (0 to 36%), common milkweed (0 to 70%), or hemp dogbane (0 to 8%) adequately, but success with killing the top growth of field bindweed was greater (50 to 100%).

**Gramoxone Extra plus atrazine plus 2,4-D.** Most broadleaf weeds were controlled 100% except groundcherry spp., Russian thistle, and prostrate spurge. High temperature the day before and up to four days after application were positively correlated with summer annual broadleaf weed control but not when 2,4-D was added.

**Glyphosate treatments.** The effectiveness of these treatments varied with weed species. For instance, it was not necessary to mix another herbicide to glyphosate for control of kochia, waterhemp spp., Russian thistle, lambsquarters spp., or buffalobur. Adding 2,4-D with glyphosate improved control of redroot pigweed and tumble pigweed. In most instances adding atrazine to glyphosate plus 2,4-D improved broadleaf control, especially waterhemp spp., Pennsylvania smartweed, and common purslane. Weed control was negatively correlated with rainfall occurring on the day glyphosate was applied. This also occurred with glyphosate mixed with 2,4-D or atrazine. The glyphosate treatments were ineffective on groundcherry spp, toothed spurge, and common milkweed.

Weed height and when weeds were cut during harvesting affected weed control. For instance glyphosate plus 2,4-D (Landmaster BW) must be applied before broadleaf weeds like kochia, velvetleaf, waterhemp spp. and common sunflower exceed 24 inches. Waterhemp spp. treated with glyphosate plus atrazine plus 2,4-D at 32 oz + 1.5 qt + 1.5 pt/A was controlled 100% when 24 inches tall, but 0% when 38 inches tall or treated with glyphosate at 32 oz/A. Control was 100% when 10 inches tall but was 0% when 26 inches tall. The cause of control variation for weeds of similar height is unknown. Weeds cut off by the combine were difficult to control if sufficient 2,4-D was not applied.

**Touchdown 5 treatments.** These treatments were very effective on all weed species except groundcherry spp. and common milkweed. The rainfast period also needs to be watched when using Touchdown 5.

**Planning a strategy**

Excellent weed control can be obtained with treatments containing glyphosate, Gramoxone Extra, or Touchdown 5 if properly applied. Base herbicide selection on weed species, weed height, weed density, and weather. If the stubble is dense, either Gramoxone Extra plus atrazine, glyphosate, or Touchdown 5 would be effective. If wheat is thin and weeds are mostly grasses, apply glyphosate or Touchdown 5. Don’t apply atrazine when weeds are dense or the weed species present require more glyphosate to control.

Atrazine is added to the herbicide treatment to control later emerging weeds such as downy brome, volunteer winter wheat, and late germinating annuals. Control of winter annual weeds is best when applied in late August or September.

Twenty percent of the glyphosate plus 2,4-D or dicamba treated fields needed a second herbicide application to control volunteer wheat. Six percent of fields needed a second application to control shattercane before viable seeds were produced. One field treated with paraquat plus atrazine had shattercane plants that escaped, grew to 30 to 60 inches, and produced seeds in September. Shattercane emerged in fields after being treated with glyphosate immediately after wheat harvest and plants were 14 to 28 inches tall in September. Some fields treated early were producing seeds in September. A two-spray treatment program can prevent weeds from producing seeds in the fall. Other weeds emerging after the initial glyphosate treatment and producing seeds were longspine sandbur, waterhemp spp., carpetweed, and large crabgrass.

Difficult to control weeds need to be targeted because they will increase as other species are removed from the fields. Those of immediate concern are yellow foxtail and waterhemp spp.

It’s important to control minor weed species after wheat harvest and in the succeeding crops before they become major weed problems. This survey indicated that toothed spurge, spotted spurge, Pennsylvania smartweed, common milkweed, prairie cupgrass, and yellow nutsedge may become problem weeds if suitable control measures are not found. Although poor control of groundcherry spp. occurred, this has not been a major weed; however, it needs to be continually monitored to prevent an increase in density, especially in eastern Nebraska.

Many minor weeds move into fields from adjacent infested areas such as pastures, roadsides, and headlands. Eliminate these sources of weed seeds and retreat 50 to 100 feet of the fields adjacent to these areas to control escaped weeds.

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Soybean Management Field Days: Improve your management strategies and enhance crop value

Understanding the latest research results and information in today’s changing agricultural environment can be a valuable management tool to help you cut costs and farm more efficiently. To help soybean producers across the state get the information they need, the Nebraska Soybean Board in cooperation with NU Cooperative Extension is sponsoring the Nebraska Soybean Management Field Days Aug. 10-13. Identical programs will be held from 9 a.m. to 2 p.m. at each of four locations.

The interactive learning events are geared to help soybean producers maximize yields and minimize production costs by incorporating best management and production practices.

Interactive discussions, guest speakers and demonstrations will be used to cover each of four topics:

- **Understanding precision ag today**, including combine dynamics and operation; interpreting data and yield maps; and using management zones and field profitability maps;
- **Enhancing soybean value**, including understanding soybean components, controlling value: genetic and environmental factors; managing value-enhanced traits; exploring marketing opportunities; and maximizing net revenue per acre;
- **Improving your sprayer efficiency**, including effects of new sprayer nozzle tips; improving spray boom setup; understanding spray additives, spray volume and spray pressure, and drift reduction; and
- **Maximizing yield**, including field and variety selection; population and row spacing; weather effects; insects and diseases; late season nitrogen; and managing harvest losses.

Norm Husa, chairman of the Nebraska Soybean Board, says the event provides an opportunity for producers to see their checkoff dollars at work and take full advantage of this investment.

Register at the door. Lunch will be served. Dates and locations are:
- Aug. 10, Charlie Grotrian farm near Brock, one-quarter mile south of the southeast corner of Brock or 3 miles east of the junctions of Highways 105 and 67.
- Aug. 11, Doug Nelson farm near Wayne, five miles north of the junction of Highways 15/35 at Wayne, 1 mile west, and one-quarter mile north.
- Aug. 12, Vince Sauser farm near Neligh, two miles west of S & S store (west edge of Neligh) on Highway 275.
- Aug. 13, Marty Damrow farm near Holdrege, one mile north of the junctions of Highways 183 and 6/34 on Highway 183. Turn east on 18th Street, then north on Tilden Street.

For more information, contact Keith Glewen, Extension educator, at (800) 529-8030 or the Nebraska Soybean Board at (800) 852-2326.

August field tours highlight value-added agriculture

The Nebraska Sustainable Agriculture Society, in conjunction with the Organic Crop Improvement Associations of Nebraska, is hosting a series of farm tours this summer. In case of inclement weather, call the number listed.

**August 7, 11:30 a.m.-6 p.m., Specialty Crops Field Day** examines the production and marketing of high-value specialty crops and livestock which can be successfully raised on a few acres or even in a backyard. This field day begins in Lincoln at 11:30 a.m. with a brief overview at the Haymarket Farmers Market on 7th St. between P and Q streets. Maps and information will be available from the Market Managers booth all morning.

At 12:30 the group will meet at the Lancaster County Extension Office at 444 Cherry Creek Road for a presentation on specialty cut flower production and marketing. Locally grown produce will be served. Please bring a sandwich and drink. At 1:30, the group will depart for farm tours via self-transportation or carpools. The tours will include:

Equinox CSA, Lincoln (2 p.m.): Ruth Chantry and Everett Lunquist will give an overview of their Community Supported Agriculture (CSA) farm where customers share the risks and rewards of farming. They raise vegetables, herbs, turkeys and chickens for garden members who receive a share of the farm’s produce each week.

Pawnee Pride Meats, Steinauer (4:30 p.m.): Paul and Cindy Rohrbaugh will explain their specialty meat and egg business. The Rohrbauhs raise poultry, eggs, and beef on pasture using management practices developed by Joel Salatin. They sell their high-value products directly to customers.

Along with the NSAS and OCIA, this field day is co-sponsored by the Haymarket Farmers Market, Lancaster County Cooperative Extension, and the UNL Center for Sustainable Agricultural Systems. For more information, call 402-471-0817 or 402-435-7496.

**August 7: Mark Tiensvold Farm Tour, Rushville, 4 p.m.**

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Sustainable ag tours
(Continued from page 163)

Tiensvold raises buffalo, grows certified organic seed and buckwheat, red clover, garbanzo beans, lentils, mustard, peas, spelt, and triticale. Please call the NSAS to confirm this tour date.

Organic Grain Farming Workshops will be held at three organic farms: August 9, Rick Gubbels farm, Randolph; August 14, Paul Hunefeld farm, Aurora; and August 17, Tim Cada farm, Clarkson. Registration begins at 12:30 p.m., workshops at 1 p.m.

Nebraska organic farmers, marketers, and certifying organizations will be discussing weed control, soil fertility, crop rotations, organic certification, and markets. For directions and more information, please call Martin Kleinschmit at 402-254-6893 or Cris Carusi at 402-471-0817. Along with the NSAS and OClA, this tour is co-sponsored by the Center for Rural Affairs and the University of Nebraska.

August 20, 9 a.m. to 3 p.m., Lauber Seed Farms Field and Plant Tour, southeast of Fairmont, co-sponsored by NC+ Hybrids and Pacific Soy and Grain. Brad Lauber will explain their composting operation and agronomic practices. He will demonstrate and compare the costs of six varieties of organic seed corn, eleven varieties of GMO-free commercial corn on a transitional field, and four varieties of organic food grade soybeans. Roger Hammons, manager of the Nebraska Crop Improvement Association, will talk about different strategies farmers can use to minimize risk of contamination from genetically modified organisms. Representatives from NC+ Hybrids and Pacific Soy and Grain will be available to answer questions. Please call 402-759-3102 to make reservations for lunch.

For more information, call 402-543-2217.

Cris Carusi, Nebraska Sustainable Agriculture Society

Precipitation
Maps courtesy Al Dutcher, State Climatologist, Agricultural Meteorology

June 28 to July 12

April 1 to July 12

Percentage of normal precipitation, April 1 to July 12