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Prospects are good for the wheat crop this year, but possible low prices have producers reconsidering their fertilizer management. For a variety of reasons, many producers are applying most of their nitrogen in the spring. Depending on nitrogen source and timing there are some advantages to this practice, however, there also are some disadvantages.

**Spring nitrogen management**

Spring fertilization means nitrogen fertilization. How much nitrogen do you need this spring? The standard answer would be to soil test for residual nitrate to 3 feet (or use a soil test from last fall), subtract the nitrogen you have already applied, and apply the remaining amount. *Table 1* shows recommended nitrogen rates for 50 bu/A wheat assuming nitrogen prices of $0.15 and $0.25 and wheat at $3 and $4 a bushel. The higher nitrogen cost slightly decreases optimum nitrogen rates. *Remember to subtract any nitrogen applied last fall from these recommendations.*

Producers should first determine if they have a good viable stand before considering additional nitrogen. Other factors also may need to be considered. For example, limited moisture and some blowing may reduce yield potential in western Nebraska. Adequate soil moisture last fall and the lack of

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An Otoe County subscriber, Gene Watermeier of Unadilla, wrote this week to ask Extension specialists about potential damage to wheat from last week’s snow and severe cold. According to the agronomists we contacted, significant damage from the recent cold spell is not likely.

Lenis Nelson, Extension Agronomist in Lincoln, wrote: The question of frost damage is difficult to predict immediately. I would guess we did not suffer too badly because we had snow cover during the coldest period. Also, the amount of spring growth prior to the cold influences the damage. We have seen some greening up, but growth was not enough to put growing point at or above ground level.

Drew Lyon, Extension Dryland Crops Specialist at the Panhandle Research and Extension Center, Scottsbluff, wrote: Except in isolated areas where some wheat was damaged by soil blowing a couple of weeks ago, our wheat is expected to be in good shape. The cold weather last week is not expected to cause much of a problem here because of the snow cover and because our wheat was not as far along as wheat at lower elevations or further south. The moisture from the snow is always welcome in the Panhandle and good spring moisture usually does us more good than cold does us harm.

Paul Nordquist, UNL Sorghum Breeder at the West Central Research and Extension Center at North Platte, said: Our wheat looks quite good. It was breaking dormancy a little bit faster than I would like to have seen. The recent cool temperatures may turn out to be beneficial by slowing plant development. If the wheat heads out too early, followed by a late season frost, serious damage could occur. This area isn’t particularly dry and had some good moisture going into winter.

Steve Melvin, Extension Educator in Nuckolls County: The wheat crop in south central Nebraska was looking very good before the early March storm. Stands were excellent and were starting to green up. How the plants will respond to the snow and cold is debatable at this time. The areas that stayed snow covered should be fine, however, large areas in most fields were blown clean of snow before the -15°F temperatures.

Noel Muess, Extension Educator in Furnas County, wrote that before the storms the wheat in south central Nebraska was in excellent condition. Moisture last fall (nearly 4 inches of rain followed by 10 inches of wet snow in October) provided needed moisture going into winter. The wheat tillered well and the result is thick uniform stands this spring. Weed pressure should be minimal but producers still need to monitor fields for weeds — particularly on field borders. Survival is excellent. With the excellent stands, producers need to pay close attention to fertility levels. A little extra fertilizer may be needed to obtain higher potential yields.
Fertilizing wheat  (Continued from page 11)

excess moisture this winter in some parts of the state have limited the loss of nitrogen from leaching or denitrification. Nitrogen applied last summer and/or fall should still be in the root zone. Table 1 provides a guide for adding nitrogen this spring. The highlighted line is a good average to use if you do not have a soil nitrate-nitrogen test. Adding extra nitrogen above recommended rates will not enhance yield of an already stressed crop. If you estimate your yield potential is above or below 50 bu/A, add or subtract 10 lb nitrogen per acre for each 10 bushel per acre change in expected yield.

Nitrogen sources

Nitrogen solutions

Nitrogen solution-herbicide combinations are popular, but they provide a management dilemma. The nitrogen should be applied early (late March) to allow distribution into the root zone with spring precipitation, but this timing may be too early for control of some weeds. Later applications are optimum for weed control, but may cause problems with plant injury because of the herbicide-fertilizer combination.

Research the past six years at North Platte has documented wheat crop damage and yield loss from herbicide-liquid fertilizer combinations. Different timings from early green-up (four-tiller) to pre-jointing were used. We cannot accurately predict the degree of damage or yield depression even if there is visual damage. Don’t stop using nitrogen fertilizer solutions for this reason, but be aware that damage can occur.

The interacting factors observed in producers’ fields that complicate yield loss predictions based on visual symptoms include:

- Floater track (more damage) vs. non-wheel track (less damage)
- No fall nitrogen (more damage) vs. fall fertilizer nitrogen (less damage)
- Disease status (more damage on diseased wheat)
- Drought status (more damage on drought-stressed vs. vigorously growing wheat)
- Variety effects
- Night temperature before spraying (more damage with freezing temps vs. warmer temps)
- Stage of growth (less damage early than later)

Research plot yield losses have ranged from 2-10 bu/A and have occurred about 40% of the time, especially for applications made just prior to jointing (Zadok stage 29). Crop injury was ranked from none to severe for the following treatments:

1) no herbicide, no damage
2) ally + 2,4-D + nonionic surfactant, less damage than:
3) 28-0-0 (UAN), less damage than:
4) ally + 2,4-D + UAN + ATS (12-0-0-26).

The research plots were weed-free and received 40 lb N/A preplant in the fall, so yield loss was not due to weed competition or nitrogen deficiency. Spraying was done so no wheat was crushed by tires (15-inch wheat rows, 14-inch tractor tires between rows). The UAN nitrogen rate was 40 lb N/A so injury may be greater or less depending on your nitrogen rate. Stressed wheat was damaged more than vigorously growing wheat and damage was greater on more developed wheat.

Urea

Urea (46-0-0) is a good choice for spring topdressing. The cooler temperatures and the greater probability of precipitation assure that there is lower potential for nitrogen volatilization loss now than later in spring.

Ammonium nitrate

Ammonium nitrate (34-0-0) is still an excellent nitrogen source for topdressing wheat, but is available only in limited supplies.

Urease inhibitor

Agrotain is a urease inhibitor which can be applied to urea or mixed with a UAN solution. It reduces the chance for volatilization of nitrogen by slowing the conversion of urea by the enzyme urease. Urease is present in the soil, growing plants and crop residues. Should you consider using it with your urea or UAN for spring top dressing on wheat? Probably not, due to limited nitrogen loss potential with early nitrogen applications.

Other nutrients

It’s too late to apply most other nutrients that might enhance yield. Phosphorus needed to be in the soil or seed furrow last fall to benefit this spring’s crop. Take adequate soil tests this summer to determine phosphorus needs for wheat planted this fall.

Most of our winter wheat is grown on fine-textured soils and there is little evidence that sulfur will increase yields on these soils. If you grow irrigated wheat on sandy soils and the irrigation water contains less than 6 ppm SO₄-S, you may need 10-15 lb. sulfur depending on what you applied last fall.

Recent research has shown that chloride (usual source 0-0-60) may enhance wheat yields. Nebraska research has shown limited response. Recently summarized research from Kansas (Great Plains Soil Fertility Conference 3/5/98) has shown that response is variety dependent and that soil chloride levels usually must be less than 20 lb/A in a 2-foot sample or plant chloride less than 0.10% at the boot stage.

Chloride applications of 25-30 lb/a have been adequate to improve yields where response has been noted. In eastern Nebraska where
Vernalization needed for replanted wheat

One of the major concerns of Nebraska winter wheat producers during the winter and early spring is stands survival. With good establishment conditions and proper seeding rates and planting depth, winter wheat is best suited for winter if it went into dormancy at the four-leaf stage. Most winter wheat drilling in Nebraska occurs from Sept. 1 to Oct. 15, depending on elevation, soil moisture, and previous crop. (Refer to NebGuide G92-1068, Planting and Harvesting Information for Nebraska Crops, and EC 97-103, Nebraska Fall-Sown Small Grain Variety Tests 1997, for planting recommendations).

Some years winter wheat producers may have to replant the crop depending on stand establishment in the fall, disease, severity of the winter, amount of snow cover, and incidence of high winds and blowing. In some cases, replanting winter wheat can be the best option if done soon enough to give the seed time to vernalize, a process necessary for normal development and heading in the spring.

Vernalization, or exposure of seeds or seedlings to cold temperatures, is an adaptation mechanism of winter-sown cereals. It is basic to breeding and selection of new cultivars. Wheat genotypes vary in vernalization response and genetic control of vernalization is complex.

Vernalization occurs when imbibed or germinating seeds or green plants are exposed to cold (32° to 50° F) for six to eight weeks.

Winter wheat normally undergoes vernalization in the field in late fall and winter. Some research has shown that the most effective vernalization temperature and duration was 36° F for six to eight weeks, and that total days required for the flowering period (anthesis) decreased when cultivars were well vernalized. Vernalization is essential for determining anthesis date.

Adaptation of wheat cultivars to different environments could be improved if their vernalization responses were better defined.

Normally, to assure adequate vernalization, wheat should be drilled before March 15 in western Nebraska or Feb. 15 in eastern Nebraska. Generally, four to six weeks of nighttime temperatures below 40° F are required for vernalization. There is considerable risk after March 1.

When drilling in late February or early March, reduce the risk by planting wheat varieties with shorter vernalization requirements. Tam 107, Karl 92, and Pronghorn have a relatively small number of days to flowering when exposed to a six-week vernalization period. Wheat well adapted to a particular farm and system should work well through March 1 in western Nebraska.

For more information on vernalization requirements, see Mehmet Atak's master's thesis published in December 1997, or contact your local Cooperative Extension office, District Research and Extension Center, or the Department of Agronomy in Lincoln.

Ray Weed, Extension Educator, Kimball-Banner counties
Mehmet Atak, graduate student, UN-L Department of Agronomy
P. Stephen Baenziger, Professor Department of Agronomy
David Baltensperger Extension Crop Breeding Specialist Panhandle Research and Extension Center, Scottsbluff

Developing wheat varieties requires patience and time

Twelve years ago the story of the newest wheat varieties began in a greenhouse at the University of Nebraska Lincoln campus.

A cross between two wheat plants was made by hand. Next year, this precious hybrid seed was grown in the greenhouse to avoid winter killing. The following four generations (one generation per year) were grown in a field at Lincoln or Mead to allow selection for winter survival, stem rust resistance, agronomic performance, and to get an indication of end-use quality.

Every year over 2,000,000 plants are grown and over 45,000 experimental lines are observed. By the sixth generation, only 300 lines have met all the criteria for advancement.

The next six generations are used to find the small imperfections that in an average year may not cause a problem, but in some fields could be catastrophic and seriously reduce the performance or quality of the line, reducing the economic return to a grower. Only after being tested in over 100 environments can the necessary data be obtained to justify an experimental line's release as a new variety.

After twelve years, 2,000,000 plants, and more than 100 trials, if you're successful you will have developed a new variety. There is never a guarantee of success, but when a new variety is released and widely grown, it is worth the wait, the effort, and the investment.

P. Stephen Baenziger, Professor Department of Agronomy
The new herbicides: What they offer

A range of new herbicides are available to producers this year, including those aligned with herbicide-resistant crops. Some have new active ingredients while others are combinations of previously registered materials. The following list includes those which are labeled for this season and some for which the label is pending.

### Accent Gold 75% + 85.6% WDG/packet
**Manufacturer:** DuPont  
**Mode of action:** ALS inhibitor and growth regulator  
**Active ingredients:** Nicosulfuron, rimsulfuron, clopyralid, flumetsulam  
**Application timing:** Post in corn  
**Application rate:** up to 2.9 oz/A (four acres/packet)  
**Note:** Basis Gold with Hornet instead of atrazine  
*Grass and broadleaf control*

### Action 4.75 WP (Label projected for 1998 or 1999)
**Manufacturer:** Novartis  
**Mode of action:** cell membrane disrupter

### Fertilizing wheat
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soil chloride levels are low (less than 20-30 lb/A in a 2-foot soil sample), or in western Nebraska if levels are less than 20 lb/A in a 2-foot soil sample and yield potential is above average, chloride might be considered. In the Nebraska research, chloride suppressed rust which accounted for the yield increase. A single spray of Bayleton near boot stage provided similar yield increases.

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**Active ingredient:** Fluthiacet methyl  
**Application timing:** Postemergence in corn from the two-three leaf stage to 48 inches and in soybeans from first trifoliate to full flower.  
**Application rate:** soybean 1.5 oz/A  
**Note:** Broadleaf control (excellent velvetleaf control) with good control of small pigweed and lambsquarters. Positioned for tank mixing with other broadleaf herbicides that are weak on velvetleaf. Performance similar to Resource (flumiclorac).

### Aim 40 DF
**Manufacturer:** FMC  
**Mode of action:** Cell membrane disrupter and pigment inhibitor  
**Active ingredients:** Carfentrazone  
**Application timing:** Post in corn  
Good to excellent control of most common broadleaf and annual grass weeds except for ivy leaf, morning glory, lambsquarter, and cocklebur. Current plans are for a carfentrazone-atrazine tank mix.  
**Note:** Chemical related to Authority (sulfentrazone) but with very different activity and less residual. Some minor bronzing may occur.

### Authority
**Manufacturer:** FMC  
**Mode of action:** cell membrane disrupter  
**Active ingredient:** Sulfentrazone  
**Application timing:** Preemergence in soybean  
Sulfentrazone provides good control of pigweed species including waterhemp, jimsonweed, lambsquarter; kochia, morning glory, nightshades, and nutsedge. Suppression of certain annual grasses.  
**Note:** Crop tolerance is good with only occasional injury on low organic matter soils or under excessively cold, wet or compacted conditions. Available alone or as a premix with the ingredients in Classic or Command.

### Authority First/Synchrony Co-pack
**Manufacturer:** DuPont  
**Mode of action:** cell membrane disrupter and amino acid synthesis inhibitor  
**Active ingredients:** (ALS - sulfonylurea); Co-pack of sulfentrazone (Authority) and Synchrony  
**Application rate and timing:** Authority 75 DF applied PRE at 4-5.3 oz/A followed by 0.5 oz of Synchrony STS postemergence. Each solu-pak treats two acres.  
**Note:** Follow all precautions related to ALS herbicides in this mixture.

### Authority Broadleaf or Canopy XL 56.3 DF
**Manufacturer:** FMC, DuPont  
**Mode of action:** cell membrane disrupter and amino acid synthesis inhibitor  
**Active ingredient:** (ALS - sulfonylurea). Premix of sulfentrazone and chlorimuron 5:1  
**Application timing:** Early preplant, preplant incorporated and preemergence for soybeans  
**Application rate:** 3.8-7.9 oz/A  
Controls annual grasses, pigweed, waterhemp, Palmer amaranth, velvetleaf, lambsquarter, smartweed, morning glory, yellow nutsedge, and nightshade.  
**Note:** Do not rotate to corn with soil pH above 6.8 unless IR/IMR corn is used.

### Authority One Pass
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**Manufacturer:** FMC  
**Mode of action:** cell membrane disrupter and pigment inhibitor  
**Active ingredients:** Co-pack of Command 3 ME and Authority 75 DF, 2:1  
**Application timing:** Preemergence for soybeans  
**Application rate:** 0.33 - 0.5 pt/A depending on soil type  
Controls annual grasses, pigweed, nightshade, waterhemp, yellow

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Gary W. Hergert  
Interim District Director  
Bart Stevens, Research Associate  
Both at West Central Research and Extension Center, North Platte

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New herbicides (Continued from page 14)

nutedge, velvetleaf, and kochia. Note: Stunting may occur at high rates or with heavy rains after planting. Rotation restrictions similar to Command.

Axiom 68 DF (label pending)
Manufacturer: Bayer
Mode of action: shoot inhibitor
Active ingredients: Fluthiamide and Metribuzin (Sencor)
Application timing: Preplant, preemergence, postemergence (label pending) in corn and soybean
Application rate: 13-24 oz/A
Controls foxtail, barnyard grass, crabgrass, fall panicum and small seeded broadleaves (pigweed, waterhemp).
Note: Similar in performance to Dual (metolachlor) or Lasso (alachlor).

Balance 75 DF (label pending)
Manufacturer: Rhone-Poulenc
Mode of action: pigment inhibitor
Active ingredient: Isoxaflutole
Application timing: Early preplant and preemergence in corn
Application rate: 1-4 oz/A
Controls velvetleaf, pigweed, nightshade, waterhemp, common ragweed, lambsquarter, smartweed, marestail and kochia, with some grass control.
Note: Will usually be tank mixed with a reduced rate of chloracetamid or atrazine to broaden control; bleaches weeds white as they emerge and contact sunlight. "Recharge" following rainfall. Stunting may occur on sandy soils or prolonged cold, wet weather.

Canvas DF
Manufacturer: DuPont
Mode of action: ALS inhibitor
Active ingredients: Thifensulfuron, tribenuron, metribuzuron
Application timing: Postemergence in winter wheat, spring wheat, barley and fallow
Application rate: 0.4 oz/A

Command 3E
Manufacturer: FMC
Mode of action: pigment inhibitor
Active ingredient: Clomazone
Application timing: Preemergence in soybeans
Application rate: 1.33 times the 4E rate
Controls grass and broadleaf weeds.
Note: Microencapsulated for less volatility than Command 4E. Do not spray within 300 feet of sensitive crops or 1200 feet of residential areas.

Distinct (label pending)
Manufacturer: BASF
Mode of action: auxin transport inhibitor
Active ingredients: Diflufenzopyr + Dichlobenil
Application timing: Postemergence in corn
Application rate: 4-6 oz/A
Controls annual broadleaf weeds
Note: The diflufenzopyr increases activity of the dicamba so that a 50% rate of dicamba provides similar weed control to full rates of Banvel. Has some grass activity.

Dual II Magnum Products
Manufacturer: Novartis
Mode of action: shoot inhibitor
Active ingredient: Metolachlor
Application timing: Preplant, preemergence in corn
Note: Contains resolved isomer of the metolachlor molecule. Use rate is 67% of Dual rates.

Expert 75 DF (projected label 1999)
Manufacturer: Novartis
Mode of action: amino acid synthesis inhibitor (ALS-sulfonylurea)
Active ingredient: Oxasulfuron
Application timing: Post in soybeans
Application rate: 1.5 oz/A
Controls cocklebur, marestail, common ragweed, smartweed, velvetleaf, and morningglory
Note: Some antagonism when tank mixing with certain post grass herbicides (less antagonism with Assure II).

Field Master
Manufacturer: Monsanto
Mode of action: ALS inhibitor/shoot inhibitor/photosynthesis inhibitor
Active ingredients: Roundup (glyphosate) and Harness Xtra (acetochlor, atrazine)
Burndown with broad residual control.
Application rate: 3.5-5qts/A
Note: For burndown of annual weeds up to 6 inches tall, with residual control.

First Rate 84 DG
Manufacturer: Dow AGroServices
Mode of action: ALS inhibitor
Active ingredient: Cloransulam methyl
Application timing: Early preplant, preplant incorporated, preemergence, and postemergence in soybeans
Application rates: soil — 0.6-0.75 oz/A; posts emergence — 0.3 oz/A
Controls cocklebur, velvetleaf, smartweed, common and giant ragweed, pigweed, lambsquarters, and morning glory with soil applications, and all of the above except pigweed and lambsquarters with post application
Note: No ALS-resistant weed control. Some antagonism with post grass herbicides, e.g., Fusilade, Assure II.

Liberty 1.68E
(for Liberty Link corn and soybean)
Manufacturer: AgrEvo
Mode of action: cell membrane disrupter via amino acid synthesis inhibition
Active ingredient: Glufosinate
Application timing: Postemergence in Liberty Link corn and soybeans
Application rate: 20-28 oz/A; one-two applications or tank mix with atrazine for extended weed control Controls annual grasses and broadleaves, top kills perennials, weak on cool season forage grasses.
Note: Not translocated significantly through the roots.

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New herbicides  (Continued from page 16)

**Lightning 70DG** (for IMI corn)
Manufacturer: American Cyanamid
Mode of action: amino acid synthesis inhibitor (ALS-imidazolinone)
Active ingredients: Imazapyr (Arsenal) and imazethapyr (Pursuit)
Application timing: Postemergence in IMI corn hybrids
Application rate: 1.28 oz/A
Controls annual grasses, broadleaves, better on lambsquarter and grasses than Pursuit, with faster action

**Matador**
Manufacturer: FMC
Active ingredient: Quinalofop
Note: Contains same active ingredient as Assure II.

**Python 80WDG**
Manufacturer: DowAG
Mode of action: amino acid synthesis inhibitor (ALS-sulfonanilide)
Active ingredient: Flumetsulam
Application timing: Preplant, preemergence in corn and soybeans
Application rate: 0.8-1.25 oz/A
Controls broadleaves similar to Broadstrike + Dual
Note: Will require grass weed control program. Follow all precautions related to Flumetsulam.

**Plateau 2L**
Manufacturer: American Cyanamid
Mode of action: amino acid synthesis inhibitor (ALS-imidazolinone)
Active ingredient: Imazameth
Application timing: Preemergence or postemergence control in establishment of native prairie grasses, wildflowers and certain legumes
Application rate: 4-12 oz/A
Controls grass and broadleaf weeds in non-crop areas
Note: Good control of cool season grasses; good leafy spurge activity.

**Poast Plus**
Manufacturer: BASF
Mode of action: Lipid synthesis inhibitor
Active ingredient: Sethoxydim
Postemergence in Poast protected corn
Application rate and timing: 18-36 oz/A with AMS and COC up to tassel
Note: For use in Poast protected corn formally called SR corn.
Possible antagonism of grass control when tank mixed.

**Raptor 1E OR 70DF**
Manufacturer: American Cyanamid
Mode of action: amino acid synthesis inhibitor (ALS-imidazolinone)
Active ingredient: Imazamox
Application timing: Postemergence in soybeans
Application rate: 4-5 oz/A (1E) or 1 oz/A (70DF)
Controls annual grasses, pigweed, ragweed, velvetleaf, lambsquarter, black nightshade, smartweed, cocklebur, and morning glory
Note: Greater activity than Pursuit on lambsquaters and grasses with shorter residual.

**Roundup Ultra for Roundup Ready Corn and Soybean**
Manufacturer: Monsanto
Mode of action: EPSP synthetase inhibitor
Active ingredient: Glyphosate
Application timing: Preemergence or postemergence in soybeans and corn
Application rate: corn — 24-64 oz/A postemergence up to 24 inches; soybean — 24-64 oz/A
Controls annual and perennial grasses and broadleaf weeds
Note: Only one postemergence application (32 oz/A) allowed in corn. A residual herbicide may be required for optimum flexibility. Avoid drift to other vegetation.

**Skirmish 25DF**
Manufacturer: FMC
Mode of action: amino acid synthesis inhibitor (ALS-Sulfonylurea)
Active ingredient: Chlorimuron ethyl
Application timing: Postemergence control of broadleaf weeds in soybeans

**Spirit 57WDG**
Manufacturer: Novartis
Mode of action: amino acid inhibitor

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Delay pruning and observe damaged pines

Winter injury is damage caused to perennial plants from desiccation and freezing during dormancy. This type of injury is favored by quick weather changes in the fall when perennial plants normally undergo the acclimation process to survive winter freezing. Recently, the Plant and Pest Diagnostic Clinic has received several pine samples showing winter injury. Other states are reporting similar problems. This appears to be related to the late October snow and ice storm. We had a fairly warm September and October which resulted in many trees not properly acclimating to cold weather.

Normally, fall frosts are signals to woody plants to begin acclimation. The sudden change in weather in late October did not allow this to occur. Even though we have had a mild winter, there is still damage as a result of warm daytime temperatures followed by freezing night temperatures.

Symptoms of winter injury vary depending on the species of pine and location. The symptoms will occur mostly on the 1997 needles, but can include older needles. Scots pine exhibit mottled browning or tanning of the needles, particularly on the newest needles close to the tip of the branch. Some needles will appear normal while others are damaged.

Other pine species may have all needles discolored. Symptoms may not appear consistent since snow-covered branches will not show injury, resulting in needles on lower branches appearing normal while needles on upper branches turn brown. Injury also will vary from tree to tree depending on wind exposure.

Austrian pines will have discolored needles at the branch tip. The main terminal shoot (the leader) at the top of Austrian pines is very susceptible to injury. Injury to this shoot can cause twin-topped trees when more than one replacement shoot is sent out in the spring. Spruce trees also can show signs of winter injury. Symptoms on spruce include browning and dropping of needles and dieback of 1997 growth.

For now, the best strategy is to wait. Don’t be in a hurry to prune! Damaged needles will begin to drop, however, undamaged buds will begin to grow and trees may have a tufted appearance. Wait until full growth has occurred before pruning.

The normal recommendation is to not fertilize trees unless you have a nutrient deficiency problem. While fertilizing may make the tree look better, it will weaken its chemical defense and increase its "palatability" to insects and diseases. Be sure to supply plenty of water. The recent heavy spring snow will help, but you’ll need to be sure the blowing winds didn’t leave your trees out of the moisture circle.

Much of this information was taken from recent newsletter articles written by plant pathologists at Colorado State University and Kansas State University.

Loren J. Giesler
Plant and Pest Diagnostic Clinic Coordinator

WeedSOFT updated with latest information

WeedSOFT Version 3.0, the latest update to the UNL Agronomy Department’s weed management software, was released this month and includes the most current herbicide information available to aid in weed management decisions.

WeedSOFT is a threshold-based, bioeconomic, weed management decision software. A wide range of experts, from interdisciplinary faculty and extension educators to independent crop consultants, were involved in the development of WeedSOFT.

The program has changed considerably since its introduction in 1992. Among the more current additions are new treatments such as Raptor1 and Liberty2, as well as current treatment recommendations for the new Roundup Ready3 crops.

WeedSOFT 3.0 comprises expertise and research from various fields. Current owners are familiar with its user friendliness and point and click style of operation. This simplicity allows WeedSOFT to be effectively used by anyone who desires to have the combined experience of an interdisciplinary team of weed science experts at the touch of a button.

For more information about WeedSOFT or to order a copy, write WeedSOFT, UNL Department of Agronomy, P.O. Box 830915, Lincoln, NE 68583-0915. To order your copy, enclose a check made out to the University of Nebraska-WeedSOFT for $185 + $10 shipping and handling. Nebraska residents will need to include sales tax.

Jeff Rawlinson, Extension Weed Science, Lincoln
Many producers are buying front-wheel-assist tractors and operating them as regular two-wheel-drive tractors. This decreases performance, reduces tractive efficiency, and wastes fuel. To get the most out of the extra money spent for front-wheel-assist, operate them as front-wheel-drive tractors.

For optimum front-wheel-assist performance, start, with weight distribution. About 40% of the static tractor weight should be on the front wheels and 60% on the rear. In contrast, two-wheel-drive tractors should have about 25-30% of their weight on the front tires and 70-75% on the rear. Most tractor manufacturers recommend the same total tractor weight per horsepower for front-wheel-assist and two-wheel-drive tractors. This can mean up to 33% less rear axle weight with front-wheel-assist resulting in less compaction as compaction is a function of axle weight. In addition, make sure that the rear tires follow in the tracks firmed by the front wheels, again reducing compaction up to 80% compared to multiple wheel tracks.

Always use single rear tires on front-wheel-assist tractors. Using duals cuts traction, increases slip, and increases rolling resistance because the outer dual wheel lifts the inner tire from tracks left by the front drive tires. Producers who think they increased pull because of duals on a front-wheel-assist tractor did so because they added weight (of the duals) to the rear of the tractor. They probably would have increased pull even more by adding the same amount of weight to both the front and rear of the tractor to maintain the proper 40/60 weight distribution ratio. (See story at right.)

In the field use the front-wheel drive all the time. Ballasting for front-wheel drive and not using it wastes power and makes steering difficult. Ballasting for two-wheel-drive and only engaging the front drive in tough spots doesn’t leave enough front weight for traction. Tractors with powered front wheels have less rolling resistance because drive wheels continually climb out of their tracks. In addition, the rear drive wheels have less rolling resistance and can pull 28% to 50% more than the front wheels because they are running in already-firmed tracks. Because of these firm tracks, a properly ballasted front wheel assist tractor will have 3% to 7% higher tractive efficiency than a two-wheel-drive tractor of the same horsepower and weight.

For optimum field performance, always use the recommended tires and inflation pressures on the front and rear of a front-wheel-assist tractor. Improper size or inflation can change the rolling radius of the tire, reducing the tractive efficiency, and may damage the power train or cause excessive tire wear. Consult the owner’s manual for these and other recommendations to get the most from your front-wheel-assist tractor.

Paul Jasa
Extension Engineer

Duals may increase compaction

Dual wheels or large flotation tires can help minimize surface compaction but have little influence on subsoil compaction. Depending on the size and hub type, adding duals may increase a tractor’s weight from 1/2 to 2 tons, increasing compaction because compaction is a function of axle weight. By increasing the tire effective width, about twice the soil volume is compacted compared to single tires. The greatest danger related to duals and compaction is the temptation to use the added flotation duals to work soil when it is wet.

Producers often add duals or weight to increase the pull of their tractor. But traction does not always increase with duals. In fact, single tires can pull as much as duals in firm soil when both are weighted equally. The increased traction from duals often comes from the added weight of the duals. However, any added weight adds to compaction. Another disadvantage of duals is that the weight and increased rolling resistance from the duals requires extra power to move the tractor itself through the field, reducing performance compared to single tires. To make more effective use of the tractor’s power, producers are usually better off by reducing draft (implement width or operating depth) and increasing operating speed since power is a function of both. The reduced draft requires less weight on the tractor to develop the needed pull, further reducing compaction.

Running duals can increase a tractor’s load-carrying capacity if single tires cannot support the load safely. Rather than using duals, a producer may be better off by switching to larger diameter tires or tires with a higher star (or ply) rating to carry the load. However, any added load increases the potential for compaction. A better alternative may be lift assist wheels on mounted equipment or switching to pull-type equipment so that more axles are available to carry the load. In addition to reducing compaction, not as much tractor front end weight will be needed for stability. Usually, lift assist wheels are cheaper than duals and are more effective at handling the load safely, especially during transport.

Paul Jasa
Extension Engineer
Planning, timing key to site-specific systems

Precision farming is not a fixed list of management practices. Yield mapping, variable rate applications, remote sensing, GPS-referenced scouting — these practices can be adopted as needed, considering your particular farm and your management concerns.

There is less flexibility on when precision farming decisions have to be made, so we are alerting Crop Watch readers to plan their site-specific management for the coming year.

Not sure how to proceed with site-specific management? You are not alone. We can’t answer all your questions about the various technologies, but Crop Watch will at least help this season by reminding you of important target dates. We also will provide you with our field observations and the current research findings you will need to make precision farming pay.

Bob Caldwell, Extension Cropping Systems Specialist

Highlights of a precision farming calendar.

<table>
<thead>
<tr>
<th>Calendar</th>
<th>Action to consider</th>
<th>Management concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>Bare soil photography</td>
<td>Quality of photos depends on soil moisture content and residue cover. Timing is important.</td>
</tr>
<tr>
<td>Spring</td>
<td>GPS-referenced soil sampling</td>
<td>Sampling strategy — grid versus targeted — and the number of samples per field influence the precision of the fertility estimates.</td>
</tr>
<tr>
<td>Spring, to side-dress</td>
<td>Variable rate applications</td>
<td>You need a good prescription equation (i.e., algorithm) to make variable rate applications pay. Be aware of current research findings.</td>
</tr>
<tr>
<td>Early summer</td>
<td>GPS-referenced scouting</td>
<td>Watch integrated pest management thresholds on a site-specific basis. Mapping becomes more difficult as canopies close.</td>
</tr>
<tr>
<td>Summer</td>
<td>Full-canopy aerial photography.</td>
<td>Color photography can reveal simple management problems.</td>
</tr>
<tr>
<td>Late summer</td>
<td>Pre-harvest tune up: check equipment. Design data handling system.</td>
<td>Yield data can be lost if there isn’t a good system for down-loading, storage and back-up.</td>
</tr>
<tr>
<td>Fall</td>
<td>Calibrate yield monitor.</td>
<td>Know and follow manufacturer’s specifications.</td>
</tr>
<tr>
<td>Fall</td>
<td>GPS-referenced scouting</td>
<td>Watch for and diagnose problems in weed control. Observations on corn stalks may indicate site-specific problems in pest control and fertility.</td>
</tr>
<tr>
<td>Fall and winter</td>
<td>Yield map processing</td>
<td>Draw maps as soon as practical — during harvest is best. Following harvest, organize maps and field summaries in a final report.</td>
</tr>
<tr>
<td>Winter</td>
<td>Learn new technologies</td>
<td>Precision farming technology changes every month. Read the popular press. Watch for educational offerings at your experience level.</td>
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</tbody>
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