1. Yield potential of wheat varieties treated with foliar fungicide

With the shortage of good quality wheat seed of newer varieties in parts of central and eastern Kansas this year, producers may have to use some older varieties that have lost their leaf rust resistance. If these varieties are treated with a foliar fungicide next spring, will producers still have to settle for lower yield potential?

Probably not, all else being equal. Varieties such as 2137, Jagalene, Jagger, and Karl 92 still have very good to excellent yield potential if they are treated in a timely manner with a foliar fungicide (if disease pressure makes it necessary). Other factors can still limit yields of these older varieties, such as freeze injury, heat, drought, flooding, hail, and so forth. But those factors can reduce yields of almost any variety, new or old.

In general, producers in central and eastern Kansas do not have to worry about settling for low yields by using 2137, Jagalene, Jagger, or Karl 92 – provided they treat these varieties with a foliar fungicide if necessary. These varieties can still be reasonably competitive with newer varieties in the absence of leaf diseases.

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2. Using starter fertilizer for wheat

Starter fertilizer for wheat is commonly put down directly with the seed. When placing starter fertilizer in direct contact with wheat seed, producers should use the following guidelines:
### Suggested Maximum Rates of Fertilizer to be Applied Directly With Wheat Seed

<table>
<thead>
<tr>
<th>Row Spacing (inches)</th>
<th>Pounds N + K₂O (No urea or UAN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medium to Fine Textured Soils</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>6-8</td>
<td>30</td>
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</tbody>
</table>

No urea-N (which includes dry urea or liquid UAN fertilizer) should be added to the starter if the fertilizer is applied with the seed. No-till producers may want to “spike” their starter fertilizer with extra N from urea or UAN in order to apply as much N as possible below the soil surface at planting time. This is not recommended since germination damage and reduced stand establishment may result.

The problem is that urea is initially converted to ammonia and may be toxic to plant roots if the wheat seed is placed in direct contact with the fertilizer. Producers may hear of someone who has placed urea in direct seed contact and appeared to have no problems, but there are also many cases where urea-containing N fertilizers has injured the developing seedling and reduced or delayed emergence significantly. The risk of injury is greater in drier soils and at higher N rates. There is significant risk associated with placing urea containing fertilizers in direct seed contact.

Air seeders that place the starter fertilizer and seed in a band an inch or two wide, rather than a narrow seed slot, provide some margin of safety because the concentration of the fertilizer and seed is lower in these diffuse bands. In this scenario, adding a little urea-containing N fertilizer to the starter is less likely to injure the seed than if urea-N is applied with the seed - but there is still a risk.

Dual-placement of N and P (anhydrous ammonia or UAN plus 10-34-0 applied in the same band below the soil surface) is a fertilizer application method usually used in preplant applications. Ammonium-N has long been known to increase P uptake by crops, and dual-placement can be very effective. Sometimes, producers will use this method at planting time, trying to position the band to the side of each row of wheat seed. Use caution, however.

If adequate separation of fertilizer and seed is accomplished, this is a good method of application that fits into many farmers’ overall no-till system. If adequate separation of the ammonia/UAN and seed is not accomplished, wheat germination/stand establishment can be affected severely. With some application equipment, anhydrous ammonia is metered and applied as a liquid as it is banded with the 10-34-0 fertilizer. Liquid ammonia will initially expand less in the soil than traditional gaseous ammonia application - and as a result, liquid ammonia could be placed a little closer to the seed. However, it is still ammonia that is being applied and it cannot be placed in direct seed contact.
3. Winter cereals for forage

With the relative scarcity of quality wheat seed for fall planting in much of central and eastern Kansas, producers needing winter pasture for their cattle may want to consider other winter cereals for grazing. Winter barley, winter triticale, and rye are all quality, affordable alternatives to traditional wheat pasture. Producers familiar with wheat pasture already have the skills to easily manage these alternative winter cereals.

* Winter Cereal Forage Selection:

Wheat and triticale are best adapted to heavier soils, but with reasonable moisture also do well on coarser-textured soils. Rye and barley have an edge for forage production on coarser (sandier) soils. Rye has the best overall production for grazing, followed by triticale, wheat, and barley. The ranking for quality is just the opposite. Barley has the highest grazing forage quality, followed by wheat, triticale, and rye.

Wheat. Winter wheat is the most diverse of the winter cereals in terms of balancing pasture production and quality. It is well-suited for pasture, hay, and silage. A variety with taller plant height may be more productive if wheat is being grown for forage purposes only.

Winter Barley. In the past, winter barley pasture was more susceptible to winterkill than the other cereal pasture options, especially when overgrazed. Breeding efforts have resulted in new, more winterhardy barley varieties well-adapted for grazing and forage production. The barbed awns of some varieties may affect hay palatability. Barley forage production is excellent in the fall under good growing conditions and typically produces more fall/early winter pasture than wheat, triticale, or rye. But late winter/spring production is less than the other three cereal pasture options. Winter barley also produces quality hay and silage. Winter barley grain is an excellent feedgrain.

Triticale. Triticale, a man-made crop, is a cross between wheat and rye. It is used extensively as a forage and grain in Europe and is increasing in popularity in the United States. Older varieties often had spring wheat in their background and were quite susceptible to winterkill. Most varieties currently available in this region possess good winterhardiness. Triticale produces more forage than wheat but is generally of a lower quality. Triticale becomes rank sooner in the spring than wheat. It is best suited as pasture and makes a lower quality hay or silage due to the larger stems, a trait which comes from
its rye background. The larger stems make curing in the field for hay more difficult and harder to properly pack for silage. The grain is an excellent feed grain. There is interest in western Kansas in using the grain in feed rations for swine production.

Rye. Rye often has a bad reputation in wheat-producing areas; however, this reputation is not warranted. As long as rye is not allowed to head and produce seed, rye contamination of wheat fields is nonexistent. To prevent seed production, rye should either be destroyed after cattle are removed, or cut for hay or silage at the late boot stage. While the forage quality of rye is lower than the other three winter cereal options (especially in the late spring), there are several reasons to consider rye in a winter pasture program. Rye is the hardiest of the four winter cereal options, stands up the best to drought and heat, recovers the most rapidly when grazed, grows quickly in fall and spring after dormancy, and is the most winter-hardy. Late-spring growth, while ample, rapidly turns stemmy and unpalatable. While rye may be used for hay and silage, it is best suited for pasture for the same reasons cited above for triticale.

<table>
<thead>
<tr>
<th></th>
<th>Winter-hardiness</th>
<th>Fall pasture production</th>
<th>Spring pasture production</th>
<th>Hay quantity</th>
<th>Hay quality</th>
<th>Silage quantity</th>
<th>Silage quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best</td>
<td>Rye</td>
<td>Barley</td>
<td>Rye</td>
<td>Rye</td>
<td>Barley</td>
<td>Rye</td>
<td>Barley</td>
</tr>
<tr>
<td>Triticale</td>
<td>Rye</td>
<td>Triticale</td>
<td>Triticale</td>
<td>Wheat</td>
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<td>Wheat</td>
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<td>Triticale</td>
<td>Triticale</td>
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<tr>
<td>Least</td>
<td>Barley</td>
<td>Wheat</td>
<td>Barley</td>
<td>Rye</td>
<td>Barley</td>
<td>Rye</td>
<td>Rye</td>
</tr>
</tbody>
</table>

* Planting Date:

To maximize forage production, winter barley, winter triticale, and rye must be planted earlier than if grown primarily for grain production. The optimum planting date range is determined by location. As a general rule, these winter cereal crops should be planted two to four weeks before the fly-free date, to maximize forage production. Typically for most of the state, conditions permitting, the first two weeks in September are suitable for planting wheat, barley, triticale, and rye for forage. If planting is delayed until October, rye is the best choice for winter/spring pasture.

* Seeding Rate and Other Planting Considerations:

Seeding rates should be approximately 50% higher for forage vs. grain production. Research at the South Central Experiment Field southwest of Hutchinson indicates that, except under extremely dry conditions, a seeding rate of two bushels per acre works well. High seeding rates ensure earlier, thicker pasture for grazing in the fall and a thinner stem size for hay and/or silage production. Depth of seed placement is similar to wheat. Controlling weeds, including volunteer wheat, greatly enhances crop establishment and growth. Proper seedbed preparation is essential for uniform seed placement, rapid germination and emergence, and growth. If the soil surface is too fine, crusting after
rainfall is likely and reduced emergence will occur. If a producer is in a long-term no-till production system, planting no-till should be acceptable. Planting in a stale seedbed is also acceptable if the soil is friable with adequate surface moisture.

* Fertilizer:

Even with higher fertilizer costs, adequate fertilization is necessary to not only optimize forage quantity, but quality. To avoid applying unnecessary amounts of fertilizer, a soil test, including profile nitrogen, is recommended. If grazing, that fact should be noted on the soil sample. As in wheat production, care must be taken not to apply too much fertilizer with the seed, to avoid seedling injury.

Lime: A soil pH of between 6.0-7.5 is ideal. On low-pH soils, high aluminum levels may harm winter cereal root systems and result in poor forage production. The Ca and Mg are also essential nutrients in animal nutrition to ensure good animal health and gain.

Nitrogen: N requirements are similar to those of wheat for forage. When grown for pasture, N recommendations are approximately 30-50 pounds per acre higher than for grain production. The following formula may be used to approximate the required amount of additional N:

\[ \text{Additional lbs nitrogen/acre} = (\text{No. of animals/acre}) \times (\text{Lbs. of weight gain/animal}) \times 0.4 \]

In a graze-out program, all N may be applied in the fall, except on coarser textured soil. However, a split application reduces the chances of elevated nitrate levels. If the winter cereal is being used as a dual-purpose crop, the N application should be split: half in the fall and half in late winter or early spring.

When growing barley, triticale, or rye for hay or silage, the N recommendation is the same as for grain production.

Other Nutrients: Other nutrients, such as potassium and phosphorus, should be applied as recommended by the soil test. It is beneficial to check soil sulfur levels, especially on coarse-textured soils. Adequate sulfur fertility ensures optimal forage production and quality, as all plant proteins contain sulfur.

* Pasture management:

Unless a market is available for grain, or the grain is for on-farm use, a total graze-out is the best option for barley, triticale, and rye, especially where volunteer rye is a concern. Cattle may be put on pasture when the plants are well-rooted and tillered, generally 6-8 weeks after emergence. If grain production is desired, remove cattle prior to jointing. Care should be taken not to graze the pasture too hard in the fall. Fall overgrazing may result in winterkill and poor spring pasture production. In the spring, it is important to stock at a rate that will maintain forage quality and not allow forage growth to become rank. As with wheat, care must be taken to monitor for bloat and the potential for grass tetany. Both situations are easily managed with proper nutrition and supplementation.
There are several varieties available of each of these winter cereals. Interested producers should consult their local seed dealers. Information is also available from County Extension Offices, and in publication MF-1072 “Small Grain Cereals for Forage”: http://www.oznet.ksu.edu/library/crpsl2/mf1072.pdf

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4. Canola planting guide

The last two years have demonstrated winter canola’s ability to withstand extremes of drought and cold. There is plenty of time this fall to consider planting winter canola as part of dryland and irrigated rotations. Adequate public and private seed stocks exist. While canola can be produced using the same equipment used for winter wheat production, it is important to consider the following factors to optimize successful canola production.

* Site Selection and Rotation Considerations:

Canola will grow well over a wide range of soil textures provided they are well-drained and the pH range is 5.5 to 7. Soils that tend to waterlog and have standing water are poor choices. Producers should not plant canola immediately following canola, sunflowers, soybeans, alfalfa, or cotton due to disease considerations. Canola follows winter and spring cereals well. Canola can also be planted after corn and grain sorghum if adequate moisture and timely harvest permits. The herbicide program used on preceding crops is always an important consideration. Most winter canola cultivars are extremely sensitive to sulfonylurea (SU) and triazine herbicide carryover. With the exception of the variety Sumner, which possesses SU herbicide carryover tolerance, 18 months is typically required following SU herbicide applications before canola can be planted. For some herbicides, a bioassay is recommended before planting. Assistance in determining the planting interval after your herbicide program may be found in the Canola Production Handbook, dealers selling winter canola seed, or your local extension office.

* Variety Selection:

Major considerations in variety selection include winterhardiness, seed yield, oil content, shatter and disease resistance, maturity, and lodging. Roundup Ready varieties are available, as is one variety with SU carryover tolerance. Seed should be treated with a fungicide and an insecticide (for fall control of aphids). Producers with a significant number of acres in canola should select two or more varieties with a range of harvest maturities to spread risk.

* Seedbed Preparation:
Since canola is a small-seeded crop (greater than 100,000 seeds per pound), a proper seedbed is critical to successful establishment. The best situation is a level, firm, weed-free seedbed with adequate moisture. A seedbed with many large clumps results in poor seed placement and poor seed-to-soil contact. A seedbed that has been worked too often may be depleted of moisture and will crust easily, preventing emergence. Preplant fertilizer and herbicide should be applied prior to final tillage.

No-till planting is an option and some long-term no-till producers have successfully produced canola. No-till planting can result in good stands; however, stand reductions over the winter have occurred where heavy residue cover persists. Some producers have overcome this problem through burning heavy surface residue immediately prior to planting. No-till production is more successful when soil has been no-tilled over a long period. Opportunistic, or intermittent, no-till planting is riskier.

* **Seeding Recommendations:**

Planting date. After seedbed preparation, seeding date is perhaps the most critical factor in winter survival. The rule of thumb is to plant canola six weeks prior to the average date of the first killing frost in the area. This allows adequate time for plant growth for winter survival and canopy development important to weed control. Planting too late will result in plants with insufficient reserves to maximize winter survival. Planting too early may result in excessive growth that can deplete soil moisture and nutrient reserves. Excessive growth may also cause elevation of the growing point and increase chances for winterkill. Research underway at K-State on planting dates is indicating planting earlier in the planting window is better for winter survival that planting later.

Seeding rate. A wide range of populations can be used with winter canola, with good results. A harvest population of four to ten plants per square foot is ideal. At the lower end of this range, canola will compensate by branching and offset the somewhat lower plant density. Whatever the population, it is important to obtain as uniform a stand as possible to help with weed control, uniform maturity, and thinner stalks. A seeding rate of 5 pounds per acre (approximately 500,000 to 600,000 seeds per acre) is recommended overall. If planting significantly earlier than the optimum date, reduce the rate by one pound per acre. If planting significantly later than the optimum, increase the rate by one pound per acre. Irrigated production can support slightly higher rates. It is very important to check drill calibration. Some drills may require a reduction kit to obtain a five-pound rate without damaging seed.

Planting depth. Being a small-seeded crop, seed placement is critical to successful germination, emergence, and stand establishment. Ideally, the best germination occurs with seed placed \( \frac{1}{2} \) to 1 inch deep. Under drier conditions, canola may be planted deeper, but delayed emergence and reduced vigor are likely. If the seed is planted deeper than that, poor stands can result, especially if a heavy rain causes soil crusting. To insure proper seeding depth, producers will probably need to use a slower ground speed when drilling, compared to drilling wheat. It is important to check seeding depth for each field.
Row spacing. Narrower row spacing is preferable for canopy closure and weed control; however, row spacing up to 15 inches is acceptable.

* Fertility Management:

A soil test, including profile N, is an important tool in determining fertilizer needs. Generally, fertility needs are similar to winter wheat except for nitrogen and sulfur. Canola needs slightly higher levels of these nutrients. It is not recommended to apply fertilizer in-row at planting as canola is extremely sensitive to ammonia and salt damage. Drills allowing for banding of fertilizers away from the row are acceptable, but the safest method is preplant broadcast applications.

Lime: If necessary, apply lime so that pH is in the range of 5.5 to 7.0 (6.0 to 7.0 is preferable) and early enough so that the lime has time to react.

Phosphorus and Potassium: If phosphorus soil test levels are above 30 ppm, no added P will be needed. Soil potassium levels are generally adequate for canola in much of Kansas, but deficiencies are increasing. If a soil test shows either P or K are needed, they should be broadcast prior to planting.

Sulfur: Canola requires more sulfur than wheat because of its high content of sulfur-containing proteins. Sulfur deficiencies are most common on coarse-textured and low organic matter soils. Applications should be made based on soil test recommendations.

Nitrogen: Preplant N applications must be carefully balanced as too little or too much fall-applied N may negatively affect winter survival. A profile N test is highly recommended for proper fall N application. One-third of total N (based on expected yield) should be fall-applied -- roughly 30 to 50 pounds per acre total N. Not applying fall N may significantly decrease winter survival and/or yield.

* Weed Management:

A clean seedbed is critical to establish winter canola. Canola competes poorly with established weeds; however, once a good stand and canopy are established, canola suppresses and out-competes most annual weeds until harvest. With incorporation, trifluralin (Treflan, and generics) and ethalfluralin (Sonalan) are effective at controlling many common problem winter annual weeds. Several herbicides are labeled for cool-season grass control in canola. Roundup Ready (glyphosate tolerant) canola varieties are available. Glyphosate is not labeled for application once the plant has bolted after dormancy. Before applying any herbicides, care must be taken to insure there are no traces of problem herbicides, such as sulfonylureas, in the spray equipment.

* Insect Control:

An insecticide seed treatment is highly recommended for fall control of aphids. Fall insect pests that should be monitored include grasshoppers, army cutworms, flea beetles,
aphids, and root maggots. If necessary, several products are labeled and provide good to excellent control.

* Grazing:

Canola can provide up to two months of excellent grazing in late fall and early winter prior to dormancy, but requires careful management. The canopy should be at least six to eight inches tall, and planting early is recommended. Overgrazing often results in stand loss. As a general rule, grazing canola decreases yield potential by one-third. Care must be taken in preventing bloat and in monitoring for nitrate toxicity. Some years fall growth will be inadequate for grazing. Producers should not rely on winter canola as the primary focus of their fall/winter grazing program.

* Insurance:

The deadline for requesting a written agreement to insure winter canola south of I-70 is August 31, 2007. Consult your insurance agent on the availability of written agreements in your area.

* Marketing:

Canola producers in Kansas will benefit from a new joint venture between the Producers Cooperative Oil Mill (PCOM) of Oklahoma City and the farmer-owned Plains Oilseed Products Cooperative (POP) of Oklahoma. The venture will create more local delivery points for winter canola, allowing farmers to add winter canola to current crop rotations. Contracts are offered on an acreage basis. Growers may contact Gene Neuens, POP executive director, for more information at 405-218-5753 or by e-mail at cscneuens@yahoo.com.

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu