

wheat. There are three nitrogen products available for surface application, ammonium nitrate, urea ammonium nitrate, and urea. They are listed in order of increasing potential for volatility. Winter wheat has excellent yield potential and the appropriate amount of nitrogen needs to be applied to meet those yield expectations.

9. Current winter wheat varieties are moderately susceptible to disease and have responded positively to fungicides. Timely fungicide applications to winter wheat planted in spring wheat stubble controls foliar and head disease resulting in higher yields and better grain quality. NDSU research trials conducted from 2001 to 2004 indicate that split fungicide applications have been the most



consistent in increasing winter wheat yields. The first fungicide application is tank mixed with the herbicide and the second treatment applied at early flower or Feekes 10.51 stage of growth. The early fungicide application is usually not required for winter wheat planted in a broadleaf crop residue.

10. Control of volunteer winter wheat is critical following the winter wheat crop to prevent the spread of wheat streak mosaic and other green-bridge diseases. Following winter wheat with a broadleaf crop can also reduce the risk of wheat streak mosaic. Winter annual weeds require special attention in winter cereal crops as they have the same growth habit.

Benefits of Winter Wheat

- Spreads the workload
- High yields
- Profitable
- Reduced cost of production
- Wildlife-friendly
- Spreads the cost of equipment
- Greater soil moisture recharge from early harvested crop
- Improves water quality
- Builds soil structure
- Reduces soil erosion

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Winter Wheat Management for Top Yields & Quality



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Guidelines

1. Plan to seed the winter wheat directly into residue managed standing canola, flax, oat or barley stubble for best results. Seeding winter wheat in hard red spring wheat stubble is acceptable, but expect more disease pressure from early season tan spot. Prior crops that are planted early and mature early facilitate direct seeding of winter wheat at the optimal date. Early planning helps to address crop rotation concerns.
2. Standing stubble needs to have the capability to trap at least two inches of snow to ensure winter survival. The standing stubble from a prior cereal or flax crop should be eight inches tall or taller after seeding the winter wheat. A previous canola crop requires a stubble height of 12 inches. A previous crop stubble height of 12 to 16 inches optimizes winter wheat survival. Consideration should be given to the prior crop variety's straw strength to assure as much standing residue as possible.



3. Make sure the combine is uniformly spreading crop straw and chaff residues to allow the drill-seeder to attain good seed to soil contact and avoid hair-pinning with disk openers. Straw

concentration is generally acceptable when spread over 80% of the width of the cut, while chaff should be spread over 60% of the width of cut. Use of harrows to spread crop residues is not recommended because the standing stubble may be knocked down or weakened, reducing its ability to trap snow and protect the winter wheat seedling.

4. Control grassy weeds and volunteer crops two weeks prior to seeding winter wheat to eliminate the “green bridge” to manage the disease wheat streak mosaic. Wheat streak mosaic is spread by the wheat curl mite. Grassy weeds and volunteer crops are hosts for the mite. Eliminating the grassy hosts breaks the life cycle of the mite and stops the spread of the disease. Neighboring corn fields can also be a host for the mite. Seeding later during the optimal seeding period can assist in reducing exposure to wheat streak mosaic.
5. Direct seed into standing stubble during the optimal seeding period (September 1 - 30). Seeding early in the time period results in a more developed winter wheat crown and a vigorous plant that will have a greater ability to survive the winter and mature early. Early seeding requires top management to avoid wheat streak mosaic.
6. Place seed 1 to 1.5 inches deep (1 inch preferred). Seed at a rate of 1.2 to 1.5 million pure live seeds per acre. Date of seeding impacts seeding rate and depth. Higher seeding rates after mid-September may compensate for stand loss from

winterkill resulting from reduced seedling crown development. Seeding shallow will hasten plant emergence and crown development. Pay close attention to seed to soil contact and soil coverage. Insufficient soil coverage of the seed can adversely affect winter survival. Seed to soil contact is influenced by proper residue spreading, depth of seeding, soil conditions, speed of travel at seeding



and seeding equipment. The use of certified seed of an adapted variety is recommended.

7. Soil test and apply phosphate fertilizer with the seed or in a band to enhance plant development and winter survival.
8. Canadian research has shown that early spring application (April) of nitrogen fertilizers provides the most consistent results. The opportunity to enhance winter wheat yield diminishes the later the nitrogen is applied. Some wheat growers apply a portion of their nitrogen at seeding or in the fall as wet soil conditions can delay early spring application. North Dakota and Montana research indicates that 2.3 pounds of nitrogen per bushel is required to attain 12% protein winter