



Extension FactSheet

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Steps to Better Wheat Yields

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The development of wheat fungicides; stiff-strawed, high-yield varieties with suitable milling qualities; and disease resistance has stimulated a renewed interest in high-yield wheat. Research on production systems conducted in the 1990s has identified the deterrents to high yields and found partial solutions to some of those deterrents. The major limitations to high yields are disease, improper nitrogen nutrition, and unfavorable weather.

Soft red winter wheat is a cool-season crop, and temperatures in excess of 80 degrees severely restrict yields. Ohio temperatures during the later weeks of June often exceed that temperature, and for that reason, maximum yields will probably not reach the 150 bushels per acre yield level common in parts of Europe where temperatures are more moderate. In growing seasons where excessive temperatures did not occur until early July, yields of up to 125 bushels per acre have been produced when the proper cultural practices were used.

Lodging can be a major yield deterrent and is due primarily to excessive seeding rates, improper nitrogen use, and excessive growth due to warm wet weather in April and May. In addition to lower yields caused by lodging, harvest is greatly slowed and harvest losses are much higher depending on the degree of lodging. Lodging can be controlled by selecting lodging-resistant varieties and reducing the seeding rate. Seeding rate trials have shown that seeding rates of 20 to 25 seeds per foot of row (90 to 110 lbs. of seed with 15,000 seeds per pound) produce maximum yields. Higher seeding rates are expensive and increase the potential for lodging and additional lost income. If planting is delayed beyond the ideal seeding period (first seven days after the fly-safe date), increase the seeding rate by one pound per day starting eight days after the fly-safe date.

Row spacings of 10 inches or less have little effect on yield. In a two-year, three-location study, 7-inch rows produced yields only 1.0 – 1.5 bushel higher than 10-inch rows over a wide range in seeding rate. Grain yields in excess of 100 bushels per acre have been achieved in both row spacings.

Wheat requires about 1.25 lbs. of N for each bushel of grain

produced. Light-colored soils with 2.0% organic matter can usually supply up to 20 lbs. of nitrogen to wheat, while the dark-colored soils with up to 6% organic matter can supply up to 60 lbs. of nitrogen to wheat. Therefore, for a yield goal of 90 bushels per acre, 92 lbs. of nitrogen should be applied to wheat growing on light-colored soils and 52 lbs. for wheat growing on dark-colored soils. The application of 25 to 40 pounds of nitrogen at planting has increased winter survival, tillering, and yield. Spring application of nitrogen should be made between March 1 and April 15. Urea, ammonia nitrate, and liquid solutions are all suitable. Narrow-tired application equipment should be used for all applications to wheat.

Wheat is very responsive to phosphate such that high soil-test levels and/or liberal application of phosphate should be made where high yields are desired. Soil P levels should be greater than 30 ppm for wheat. Lower soil-test levels can be compensated by the application of P_2O_5 at planting. Detailed fertilization recommendations can be found in the current *Agronomy Guide*.

In recent years, increased seeding rates, early planting, and higher rates of nitrogen used on wheat have resulted in a higher incidence of disease, which can greatly reduce yields. Major disease problems, such as powdery mildew, leaf rust, Stagonospora leaf blotch, and Septoria glume blotch, and several virus diseases, can reduce grain yields as much as 20 to 50%. Some of the potentially important wheat diseases can be controlled by using proper seed treatments, foliar fungicides, varietal resistance, and cultural practices (i.e., crop rotation and grassy weed control). Barley yellow dwarf virus disease is transmitted by aphids and may be controlled by delaying planting until after the fly-safe date. Proper application timing of fungicides is important for adequate disease control. During the months of May and early June, fields should be visited weekly to determine which diseases are present, their stage of development, and severity. Generally, fungicide application should be made between flag leaf emergence and the flowering stage of the wheat crop.

Control weeds where appropriate (see OSU Extension Bulletin 789, *Weed Control Guide for Ohio Field Crops*).

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