

Key points for growing winter wheat

Choice of cropland – in the case of winter wheat, you are picking your field with both crop rotation for disease issues AND stubble for winter survival in mind. The best choice is canola stubble, followed in order by flax, oats, barley and wheat. Crop straw and chaff needs to be spread evenly prior to seeding, with care taken not to cause break down of the stubble.

Plan for snow trap.

Snow trapping potential (STP) is a measurement index determined by the height and density of the stubble of the previous crop.

$$\text{STP} = \frac{\text{Stubble height(cm)} \times \text{stubble stems per metre row} \times \text{stubble rows per metre}}{100}$$

A minimum index of 20 is required to trap sufficient snow. This blanket of snow can protect the winter wheat by maintaining an 'even' temperature of about -5°C , even if air temperatures go down to -35°C .

Seeding

Seed shallow – aim for $\frac{3}{4}$ to 1 inch deep. Seeding too deep results in the plant expending energy to move the crown up to $\frac{3}{4}$ inch below the soil surface. This can delay crown development, compromising winter survival. The crown of the plant will always seek the $\frac{3}{4}$ inch level. Don't seed winter wheat to moisture – seeding shallow is critical.

The crown is the knob or bulb of tissue that survives over winter. Leaves and roots generally die. (Remember that you can't base spring assessment on above ground green growth that is last year's leaves. New growth of roots and leaves indicates successful winter survival.)

Seed on time – MCIC dates for winter wheat are August 20 – September 15, with reduced coverage to September 20. Don't delay seeding, waiting for a rain.

Optimum seeding time is August 25-September 5th. 'Seed 2 weeks late – harvest 2 weeks late.' This might not always hold true, but later maturing crops due to later seeding can eliminate the benefit of spreading out next year's harvest.

Seed the correct rate.

Ideal plant stand is 20-30 plants/ft² is ideal (same as spring wheat). Seeding rates typically range from 1.5 to 2.5 bushels/acre. Thousand kernel weights are always a good idea, to make sure you are hitting your target plant population. It's probably a good idea to aim for the higher seeding rates with the semi-dwarf varieties, such as Falcon. Keeping the plant population high aids in crop competition for weed control.

Always use a starter fertilizer.

Phosphate (P) is important for root growth, both spring and fall, and is critical for winter survival of crown tissue, as well as for recovery from winter injury. A general recommendation for phosphate will be in the 30-40lbs P/acre range. Aim for 40 lbs P if your field tests low for residual phosphate; 30-35 P should be added if the field tests in the medium to high range.

Potash (K) assists with straw strength, and disease resistance. Our heavy clays are naturally high in potassium, but starter K of 10-15 lbs/acre will add chloride. **Chloride (Cl)** is important for disease resistance, including physiological leaf spot, which can't be controlled with fungicides.

(McClintock is the first variety to exhibit resistance to physiological leaf spot). If you aren't in the habit of adding potash to your starter blend, your soils will become deficient in chloride, over time. Cereals will respond to chloride in these situations.

Sulphur – add according to soil test. Sulphur is important in amino acid production, which are the building blocks of proteins. If you have any problems with low protein in wheat, or have high sulphur using crops in your rotation (e.g. canola, alfalfa, sunflowers), the addition of 5 to 7 lbs actual S is a good idea. Sulphur can be added in the spring – if applying nitrogen in the liquid form (28-0-0), adding sulphur (ammonium thiosulphate) can further reduce the risk of losses due to volatilization. (Note that low protein in winter wheat in a high-yielding crop is usually due to the crop running out of nitrogen – the N has gone to produce the bushels)

Copper is not a concern on most soils – never apply copper without a soil test. The majority of soils in the Red River Valley have ample copper to sustain a good yielding winter wheat crop. (Mississippi soils are most likely to be deficient – heavy clay soils are almost never lacking) Copper is best applied as a broadcast application, and then incorporated. If applying copper with the seed, never add more than 1 lb copper/acre, due to high risk of seed toxicity. Copper isn't mobile, so you can broadcast an amount to be available for several years.

Nitrogen - Don't add any additional N to winter wheat at seeding or in the fall! Adding N can severely reduce winter survival of the crop. It can also result in significant stand thinning, particularly in dry soils. 40 lbs P will give you 8.5 lbs N (11-52-0). And this is sufficient to get the crop growing. The emphasis is on crown development, not on green growth. If your soil test comes back really low (under 10 lbs/acre), you might want to bring the N up to 20 lbs/acre, but the jury is out on even that amount. Add the extra N in early spring, when it will give you more bang for your buck.

Watch for weed competition

Once the crop starts to grow, watch out for high populations of broadleaf weeds. If frost isn't imminent, the field may require a fall application of herbicide. Often, a low rate of MCPA or 2,4-D is enough to knock back the weeds. Watch timing for 2,4-D – wait for tillering before applying.