



**Resource Centre For Agrologists
and Certified Crop Advisors**

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Bulletin

HOW TO GROW WINTER WHEAT FOR ETHANOL

Winter wheat is considered one of the leading choices as the primary feedstock for the production of this newer source of alternate fuel to replace portions of the petroleum-based fossil fuels, and protect our environment from harmful emissions.

Ethanol is a renewable fuel, typically produced from plant matter, and is considered a valuable tool in economic development, since nearly 70% of the revenue from an ethanol plant is spent within a 150 km radius of the plant site.

Selecting a Field

Winter wheat performs best when seeded into field stubble of canola, or mustard, but can be grown on barley or oat stubble, if care is taken to avoid volunteer grain problems. It is not recommended to plant winter wheat on stubble of any other wheat, primarily to avoid disease problems such as wheat streak mosaic. Try to have 12-15 inch high stubble cover for best winter survival results, and employ minimal disturbance seeding methods to minimize stubble knock-down. Low residue crop stubble like pea or lentil is not recommended, due to minimal snow trap potential, although they do offer advantages from residual nitrogen, earliness of maturity, and desirable crop rotation. If you do happen to select a low

residue field, try planting 7-10 days earlier than normal for your area, and seed at a slightly increased seed rate, taking care to remove as much competition as possible from weeds and volunteer crops. Thicker, more advanced crops tend to develop more crown tissue and survive winters in better condition than shorter, later and less developed crops.

Seeding

The first rule for seeding winter wheat is to seed shallow, usually less than 1 inch deep, and place all the required phosphorous fertilizer right with the seed at seeding time.

Use pedigreed seed if possible, as it is of guaranteed quality. Provincial seed guide listings will provide you with the recommended varieties to produce a successful crop, but if you have a choice, go with the newest release, as it usually contains many advantages such as increased disease resistance, higher yield potential etc. Seed a minimum of 2 bushels per acre as a guide to allow 25-30 plants to establish per foot of row, and provide a sufficiently dense growth to develop. The name of the game is yield, and a stronger seeding rate tends to produce higher yields, with more plump kernels, with crops that develop more evenly.

Fertilizing

Winter wheat requires all the phosphorous early to establish a strong crown structure. It should be placed right with the seed in the row, at the time of seeding, along with some starter nitrogen. The majority of the nitrogen required has traditionally been applied early in the spring to the already established crop, as early as practical, as long as the ground can support field machinery. Winter wheat uses most of its' nitrogen in the first 5-6 weeks of spring growth and any delay in applying nitrogen will decrease yield potential, and tend to lower bushel weight. You will be rewarded for nitrogen, as winter wheat will provide a tremendous yield response to applied quantities, and will yield considerably less if none is applied. Some areas of production will show results from applied potash or sulphur, particularly in areas where leaf disease pressures are high, so if you are in doubt, contact your local Agrologist for assistance. Soil testing is a recommended practice when trying to produce maximum yields with good test weights.

Disease and Insect Issues

Winter wheat is no different than any other type of wheat when it comes to insect infestation pressure, and production for ethanol requires sound kernels free from insect damage, otherwise you will receive less returns for the bushels delivered to the plant. They may still take your product if you provide a representative sample, but it is best to check with the plant in advance.

Measures to keep insect damage to a minimum are recommended, but a harvested sample that falls outside the recommended specifications may be taken to a seed cleaning plant and processed to remove the lighter or

damaged kernels to make the sample acceptable.

Similarly, with grain samples containing the remnants of disease infested fields, it may become difficult to market through ethanol plants. Measures to keep disease infestations to a minimum are recommended. Winter wheat typically has very little varietal resistance to Fusarium, so it is very important to follow seeding and growing recommendations to avoid the problem wherever possible. Normally, winter wheat, when grown properly, misses the window of infestation from Fusarium

Following the rules for good production should provide product which will be the preferred feedstock grain for the ethanol plant.

Typical Purchase Specifications

Dockage	Some separable weed seeds
Moisture	Dry for hammer milling <13.5%
Test weight	Minimum 58 lb/bushel
Fusarium	Maximum 1ppm Vomitoxin
Mixed grain	Maximum 3% other grains
Sprouted	some accepted with min test wt
Heated, insect damage etc	- check with plant
Samples	1-2 lb sample required for price determination with Name, Phone #, type of wheat and quantity available

For more information contact the ethanol plant or company listed below, or contact the office of Winter Cereals Canada.

