



Oat Production and Markets

Oat is an important crop worldwide, with production at approximately 25 million tonnes. Canada is a major supplier of oat, making up the majority of world oat trade. Oat and other small grain cereals were introduced to the Prairies in the mid-1700s. Oat was an important feed crop for early settlers in Western Canada.

Oat continues to be a major cereal crop in Saskatchewan, with an average annual production in recent years in excess of 1.5 million tonnes, on approximately 1.5 million acres. Oat production in Saskatchewan has been steady. Recently, demand has been strong from the United States food market, as well as the livestock market. The majority of oat trade is with the United States, with Canada being their major supplier.



Photo: Saskatchewan Agriculture

The four main uses for oat are general livestock feed, human consumption, recreation horse feed (pony oat) and forage. While the major use is as livestock feed, the human food market for oat is growing as consumers recognize the dietary benefits of whole grains. Oat offers a plentiful source of bran, fibre and beta-glucan.

Milling Oat	Pony/Race Horse Oat	Feed Oat
Low hull content Preference for a white hulled oat (but tan oat varieties may be acceptable) Minimum test weight of 52 kg/hl (40.7 lb./bu.) Minimal foreign material (weed, oilseed or pulse seeds) Maximum 1% of wild oat, barley or wheat seed Greater than 96% sound oat grain High percentage of plump kernels (i.e. <10% thins through a 5/64 in. x 3/4 in. slotted screen) Minimum protein of 11.25% Less than 13% moisture content Mature kernels Less than 0.2% heat damage Pre-harvest weed control products are not recommended Stored grain pesticides not recommended, with the exception of diatomaceous earth 2 CW grade or better (consult the Canadian Grain Commission's Grain Grading Guide)	Minimal foreign material (weed, oilseed or pulse seeds) No wild oat seeds A bright, white, plump kernel Polished and clipped kernels preferred High test weight	While not as critical, top-quality feed oat will have similar specifications to those required for the milling or pony oat markets.

Beta-glucan is a soluble fibre found in the cell walls of different grains. It has been shown that whole oat products, as part of a diet that is low in saturated fat and cholesterol, may reduce the risk of heart disease. Research has also shown that the beta-glucan soluble fibre in whole oat products is partly responsible for lowering blood cholesterol. It is also thought that beta-glucan plays a role in regulating blood sugar, which has implications for managing diabetes, and possesses anti-oxidant attributes.

Quality Requirements

The specifications on the following page are general quality requirements. Note that different buyers may have slightly different specifications. Check with the buyer to obtain specific quality guidelines and preferred varieties.

Agronomic Considerations

Selecting a Field

Avoid fields with suspected wild oat and volunteer cereal problems since these cannot be controlled with herbicides in an oat crop and are impossible or very difficult to clean from an oat sample.

The pony oat market has a zero tolerance for wild oat and the milling market allows between one and two per cent wild oat dockage, depending on the marketing company. Companies require the lot to be 96 per cent sound, with specific tolerance guidelines for various types of contamination (wheat, barley, rye, pulse, oilseeds, etc.). Also, broken kernels of pulses and other crops may be very difficult to clean from the oat sample, rendering it non-acceptable for the food and pony markets.

Avoid fields that have been recently treated with herbicides where residues may have harmful activity on oat. Consult herbicide labels and the Ministry's Guide to Crop Protection for details.

Select a uniform field that will allow even germination, emergence and maturity, thus avoiding green patches at harvest. If green patches do occur, swath and harvest around them to maintain the most uniform sample possible. Areas with wild oat and green patches can be harvested for feed oat as requirements are not as stringent. However, the same general guidelines for field selection will still apply.

Selecting a Variety

Using certified seed assures quality and varietal purity. Using oat seed contaminated with other cereals and/or wild oat greatly reduces the chance of producing a milling or race horse grade oat. It is especially important to use clean, high-quality seed when growing oat for these markets.

Select a variety with high test weight and low hull content. Varieties with a bright, white kernel are preferred by the milling and race horse markets. Tan-hulled varieties are acceptable for milling, but buyers are cautious when they see darker hulls because the tan colour may indicate that weathering or heating has occurred.

If growing oat in south-eastern Saskatchewan, crown rust (leaf rust) and stem rust resistance

may be important features necessary to ensure good production, especially if planting after May 20. Planting early can help avoid rust pressures in most years.

Although many oat varieties have some level of resistance to smut, a few varieties are susceptible. Use resistant varieties or treat the seed with an appropriate fungicide if smut is suspected.

Consult the most recent edition of the Varieties of Grain Crops for more information on variety characteristics.

Seeding Date, Depth and Rate

Planting early will also help to avoid drought and heat at heading. Delaying seeding can push crop maturity into the cooler, wetter conditions of September, increasing the risk of weathering damage at harvest. The shorter days and reduced heat at this time can significantly prolong crop maturity and dry-down. Mid-May seeding is generally best. The soil temperature at seeding should be at least 5 C.

Planting should be relatively shallow at 25-50 mm (1-2 in.) deep. Adequate soil moisture will promote uniform germination and emergence.

Depending on the region, the target plant density is 20 to 30 plants per sq. ft. (215 to 320 plants per sq. metre).

Producers must account for the rate of germination and seedling mortality. Seed weight can vary, depending on the variety and quality. Therefore, it is strongly recommended that seeding rates be determined on the basis of intended plant density, thousand kernel weight (TKW) and the per cent survival (percentage of seeds that are expected to germinate and produce vigorous seedlings). The TKW for oat is generally between 35 and 45 grams.

The formula below provides an approximate seeding rate calculation.

$$\text{Seeding rate (lb. per ac.)} = \text{plants per sq. ft.} \times \text{TKW (g)} \times 10^* \div \text{per cent survival}$$

**This is a conversion factor used to convert to appropriate units.*

Example: 25 (plants per sq. ft.) x 40 (g) x 10 ÷ 85 (per cent survival) = 117 lb. per ac. (seeding rate).

The [seeding rate calculator](#) on the Alberta Agriculture and Rural Development website provides a convenient method to determine appropriate seeding rates.

Higher plant densities are typically used when moisture conditions are good. This is why seeding rates in the black soil zone tend to be higher than those in the drier brown soil zone. Seeding at the high end of the recommended range may reduce the number of tillers and shorten time to maturity under sub-optimal conditions.

Fertilizer Practices

A properly fertilized oat crop should have a very high yield potential. Yields in excess of 100 bushels per acre are not uncommon with newer varieties. Use a soil test to determine which nutrients may limit growth and the amount of each nutrient needed to correct the deficiency for various soil moisture levels. Excess nitrogen may result in lodging and delayed maturity. Lodged crops generally produce lower test weight and have less acceptable milling attributes.

A 100 bushel per acre crop will use about 100 lb. of nitrogen, 40 lb. of phosphorus, 150 lb. of potassium and 15 lb. of sulphur. Of the cereals, oat has the highest sulphur requirement. If producers are planning for high oat yields on soils marginal in sulfur, they should correct the deficiency by applying a sulfate form of sulphur.

Weed Control

Herbicide options are limited, therefore alternative agronomic options for weed control such as pre-seeding burn-off and increased seeding rates should be considered, especially for control of grassy weeds including wild oat. Careful crop rotation planning so that oat crops follow crops where good weed control has been obtained is important. Consult the Ministry's Guide to Crop Protection for weed control in oat. There are no herbicides that will control wild oat in a tame oat crop. Assess each field for weeds and plan accordingly. Always read and follow herbicide label directions.

Harvesting

Oat crops are subject to shattering. The crop should be left standing as long as possible to maximize grain plumpness and to minimize percentage of green kernels (for the milling and race horse markets) or risk of weathering in the swath. Ideally, a milling oat crop is ready to swath when the kernel moisture content is below 20 per cent. However, acceptable milling oat can be produced when swathed at up to 30 per cent moisture and cured in the swath. In a crop yielding 100 or more bushels per acre, even a small percentage of shattering will be very noticeable, but may not be of economic significance.

Harvest patches with green or wild oats separately. Avoid peeling and breaking the kernels during combining.

Combine settings should be similar to that used for malting barley: slower cylinder speed, wider concave setting and minimum return.

Storage and Sampling

For safe storage, kernel moisture must be 13 per cent or lower for milling oat. Oat with higher moisture content should be dried shortly after harvest using natural air aeration or heated air drying. For commercial use, keep the temperature below 60 C. Oat can heat quickly if not dried soon after harvest.

Preparing a representative sample is as important for oat marketing as for malting barley. Take two to three handfuls from each truck load as the storage bin is filled. Mix the collected sample well and store in a covered labelled container in a cool, dry place until the samples are selected by potential buyers. Submit samples to many potential buyers.

Oat for Forage

Oat for greenfeed or silage should be harvested when the kernels are in the soft dough stage for maximum production and quality.

Cost of Production

For cost of production of oat, consult the Ministry's Crop Planning Guides. The numbers provided are estimates and should assist in making cropping decisions.

For additional information

Contact the Agriculture Knowledge Centre's toll-free line at 1-866-457-2377; or

Email aginfo@gov.sk.ca.