Oats

General Information

Oats (*Avena sativa* L.), while difficult to process, are relatively simple to grow in the northeast. They do very well in cool, moist climates, grow quickly, and are able to tolerate mild frosts. Oats have been eaten for centuries and have traditionally thrived in the cool climates of Scotland, Ireland, Germany, and Scandinavia. Because oats were well-known as animal feed before they were milled for human consumption, the first producers of oatmeal for humans were actually ridiculed. Now, however, oatmeal is considered a healthy and elemental part of many people's diets.

There are both hulled and hull-less varieties of oats available. In addition to grain for human and animal consumption, oats are often grown in the north as a cover crop primarily for weed control and soil improvement. However, they are a delicious cereal crop that is high in nutrition as well (oats generally contain between 12 and 22% protein). Oats for human consumption, or milling oats, should be plump and heavy. Some growers have found that heirloom varieties, like 'Rodney,' are more productive and can combat weeds better than their shorter-stemmed contemporaries. The most commonly-grown species of oat in northern climates is common white oats, which tolerate cool weather better than the red oats sometimes grown in the southern United States.

Planting

In our northern New England climate, oats are planted in early spring, at a depth of about 1-2 inches, and harvested in mid-summer. Compost or manure should be applied in the fall preceding planting, and oats should be planted in moderately fertile, well-drained soils. Oats require more water than other cereals, however, and will do well in seasons with adequate rainfall. It is recommended that in the autumn prior to planting, oat growers disc and ridge their soil to aerate and warm the soil more quickly in the spring; this will help reduce the chances of damage caused by phytotoxins (harmful toxins in soil residue). A general rule of thumb for the northeast is that oats will do well in the same sorts of soils preferred for potatoes.

Because oats do well in cool weather and can tolerate light frosts, they should be planted as early as possible, once the ground is workable. They will germinate more quickly than most cereals, compete against early weeds and take advantage of spring moisture in the soil. Usually oats are planted with a grain drill at a rate of about 2.5 bushels/acre (80 lbs/acre). Seed can also be broadcast and then gently tilled or culti-packed, but the seeding rate may need to be increased to 3 bushels/acre (96 lbs/acre) to allow for the same germination. Thin-hulled varieties of oats generally produce higher yields (and groat percent, or the percentage of the entire kernel's mass that is usable groat), and can contain more protein as well. In a small-scale or home garden, preparing and planting oats can be done with a rotary tiller. Work the soil in the fall preceding

planting, hand-broadcast the seed when the soil warms up in the spring, and then gently till the seedbed again to bring the seeds into contact with soil.

Although oats do grow well in fertile soil, they grow without heavy fertilizing, and can in fact be adversely impacted by high additions of nitrogen. Once the growing season has begun, the color of the plants will help indicate the fertility of the soil; dark green oats signify soils that are too high in nitrogen and will be more likely to lodge, or fall over, whereas light green plants will indicate that the nitrogen in the soil is inadequate and will possible yield poor-quality oats. (If your oats are not high-quality enough for milling, they can often be used as animal feed instead.)

Cultural Practices

Rotating cereal grain crops is an efficient way to control weeds. In addition, oats are often planted with red clover, which will crowd out weed populations and can be left in the ground for another year of growth. This will ultimately improve soils by adding nutrients to the field while reducing potential for erosion. Clover can either be inter-seeded at the same time as oats with a grain drill or broadcast after the oats have established themselves. If broadleaf weeds are a problem in the field used for oats, growers can plant their oats and then blind-harrow with a light-weight harrow before the oats emerge to kill upcoming weeds. Legumes like clover can then be broadcasted once the oats are in the three- or four-leaf stage. If necessary, oats can be cultivated with a tine-weeder to knock down weeds, but the oats themselves will compete fiercely with weeds further into the growing season. In small gardens or plots, oats can be planted in rows and cultivated to minimize weeds.

If the oats are harvested as a cereal crop, their stalks can be chopped and left on the ground, and the stubble will catch snow and protect the soil through the cold northeast winter. Because the roots and stalks of oats are rich in carbon, they can then be turned into the soil the following spring to improve soils. Oats are often used in this way as a "catch crop" for their ability to take up excess soluble nutrients, which are re-released once the plant is tilled into the soil and broken down.

Leaf or crown rust can present a problem for oat growers, but rust-resistant varieties are now available, and removing any potential hosts (such as wheat, triticale, and wild grasses) from the edges of fields will also minimize damage. Rust has proven to be more of a problem in southern and central areas of the United States, but northern growers should be aware of its existence. Likewise, aphids have been known to enjoy oats. To minimize diseases and pests, rotate crops and avoid planting oats in the same field year after year, or immediately following a crop of other grains.

Harvesting & Storing

When ripe, healthy oat plants should mature into a solid yellow color. They should not be harvested for grain until they are very ripe, unless they are to be windrowed. For milling, growers should choose a variety of oats with a plump kernel and, ideally, a test weight of at least 38 lb/bushel. A test weight any lower than 30 lb/bushel indicates that the harvest contains

shriveled oats with little potential for both germination and nutrition. As oats are evaluated by processors for milling quality, the important characteristics of good oats are generally high test weight, bright groat color, high groat percent, low oil content, and high protein and beta-glucan content.

Usually, oats can be harvested about 12 weeks after they are planted. In areas where weeds are prevalent, it may be beneficial to swath, or cut, the crop before combining. Weeds will certainly make harvesting more difficult, and the weed seeds and chaff can be difficult to separate from the oats. Swathing the crop first, and then windrowing oats, will allow further ripening and drying, as long as conditions are dry. Some combines have pickup attachments that can harvest these windrows, and many northern growers use this method, insisting that oats ripen slowly and unevenly on the plant.

Oats should have 12 to 12.5% moisture for harvesting and storage, and should be harvested only when conditions are dry. In some cases, further aeration will be required once the oats are harvested. To keep oat quality high, it is important to keep your crop free of insects and mold, and carefully dry and store the crop.

Oats can be threshed and winnowed just like wheat, but the further processing necessary for human consumption is a rather difficult process. Oat groats have a hard, tight hull around them, and this must be removed before eating. De-hulling oats is a complicated process, generally done either with a compressed-air or impact de-huller. For large-scale growers it may be difficult to find processing facilities. There are hull-less varieties of oats, *Aveda nuda* L., but some growers in the northeast avoid "naked oats" because of their low yields and high desirability to birds (others suggest that because the plants are not usually strong enough to support a hungry bird's weight, bird damage is not a serious problem).

When oats were first harvested for human consumption, they were hulled with stone mills, winnowed to remove the hulls and debris, and ground into course flour, which, then required three or four hours of cooking time in order for the lumpy, pasty oatmeal to be eaten. Now, processors heat oats to make the hulls brittle and easier to remove, then remove the hulls from groats with impact or compressed air de-hullers. The groats can then be used as is (although they take much longer to cook this way) or sprouted. They can be rolled and flaked or steel-cut for oatmeal. Oats are sometimes steamed for a longer shelf life, which stabilizes the lipase enzyme (problematic because of oats' relatively high fat content). However, in cool climates, many suggest that steaming may be an unnecessary step for small-scale growers, unless the oat variety is very high in oils and causes concern over rancidity.

References:

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