

Flax

General Information

Flax (*Linum usitatissimum*), also known as linseed, has been a domesticated crop since very early in human history. Flax was predominantly used for fiber until the advent of the cotton gin in the late 18th century. It is also pressed for oil and used for human consumption as a grain. Its seeds and meal (after pressing) can also be fed to poultry and livestock. Flax is a cool-climate crop but requires a longer growing season than wheat and flowers for about three weeks. Flax produces small seeds that are ready to harvest approximately 30-40 days after flowering. Flax is valued for its nutritional uses; whole flax seeds are high in fiber valued for lowering cholesterol, while flaxseed oil is high in beneficial omega-3 fatty acids. The term “linseed oil” generally refers to an industrial finishing product that is toxic and not for human consumption. Many people enjoy the taste and benefits of flax, and producers have noticed a recent increase in demand as well as high prices for both whole flax and flaxseed oil, especially when grown organically.

Preparation & Planting

Flax has similar fertility requirements as oats—it is generally a light feeder and does not require large inputs of nitrogen but will utilize what is already in the soil. The best way to determine appropriate nitrogen levels is to have a soil test taken. If nitrogen levels are too high, as with oats, flax can become over-fertilized and weed



pressure will be more of a problem. For adequate flower and seed production, high levels of phosphorus and potassium are needed (approximately 20 lbs per acre of phosphate and potash are recommended). Flax does well in soils with pH levels between 6.0 and 6.5.

To prepare the seedbed, start with a loamy (or fine clay) soil and till in the fall to reduce weeds and pests. In the spring, if weeds are problematic, a light tillage (no deeper than 4 inches) before planting will help. For more uniform planting depth and seedling emergence, roll the seedbed prior to planting with a cultipacker. Since flax can undergo light spring and fall frosts without too much damage, plant in late April or early May (around the same time as you would plant oats)—earlier plantings will lead to better yields and higher oil content. However, if weeds are a problem, delaying your planting date to allow for one additional cultivation is probably

worthwhile, as yields will not decrease as dramatically as they would by delaying the planting of many other small grains.

Generally, flax is seeded at 40-50 lbs per acre into firm, moist seedbeds. When selecting a variety, consider maturity, disease resistance, and oil quality, depending on your desired use. If you save your own seed, choose seed that is undamaged—even minor seed cracking at harvest can lead to decay over time. Many growers treat all seed with a fungicide to avoid this problem. Because flax is such a small seed, it is not planted as deep as most cereals (as shallow as ½ - 1”) and can be seeded with two passes for more aggressive canopy development and weed control. A grain drill is typically used to plant flax, but it can also be planted with a roller-type seeder, similar to legumes.

Cultural Practices

Flax is an annual plant that grows to 12-36” (depending on variety and growing conditions) and has attractive, 5-petaled blue flowers. Each flower has a boll with an average of 6-8 seeds. Because the plants are indeterminate, they will continue to flower for weeks and mature unevenly; however, later-season flowers will not develop ripe seed. Flax requires adequate moisture during the growing season, and does well in cool climates with moderate to heavy rainfall.

Because of flax’s open canopy, it is not an aggressive competitor and often intolerant of heavy weed pressure (especially, in cold climates, from quackgrass). One of the most effective ways to manage weeds is preventative—flax should only be seeded into clean, weed-free seedbeds. Fields should also be scouted regularly for both weed and pest damage. In addition, many growers interseed flax with grasses or legumes, (such as sweetclover, lentils, or alfalfa) once the flax has emerged. The interseeded crop will compete against problematic weeds as it becomes established, and can help to add nutrients to the seedbed as well. In addition, flax interseeded with another crop may have fewer problems with *Sclerotinia*, a white mold that develops on decomposing leaves and flower petals, and may be easier to harvest due to the structure of a more rigid companion crop. If mechanical cultivation is necessary, till shallowly, so that weed seeds are not distributed. Herbicides can also be applied post-emergence to control weeds.

Flax is susceptible to rust, a fungus which affects the leaves and stems of the plant and reduces yield. This problem may be aided with fall plowing to remove plant debris and clean the seedbed prior to planting, and some varieties of flax are more disease-resistant than others. Crop rotation will help minimize insect and disease damage. Because flax is grown and harvested in a manner similar to other small grains, but does not belong to the same family and therefore harbor the same diseases, it is a great crop to add to a small grains rotation. Flax grown in a rotation with wheat and other cereals can help break a cycle of disease in a field. Flax should not be grown after pulses (like dry beans or peas) to prevent *Rhizoctonia* infection, and should not follow brassicas, sorghum, or millet.

Harvesting & Storing

A wide range of yields (anywhere between 15-24 bushels per acre) can be expected from a flax crop. Test weights should be close to 53-56 lbs per bushel.

Timing the flax harvest is difficult—when ripe, flax can spoil easily if it is not dried properly. An early harvest will lead to a reduced yield, whereas late harvests will result in a reduction in oil quality due to changes in the chemical composition of the seed. If the field is not consistently mature, many growers will swath their flax before combining and then allow the flax to dry in the field. In that case, flax should be swathed when about 90% of its leaves have fallen to the ground and the seeds are dark brown, and can generally be combined 3-4 days later, if conditions are favorable. Combine when moisture levels are 12% or lower, and make sure the cutter bar is sharp and the combine is well-maintained. Flax is difficult to thresh, but adjusting the concave so that it is close to the cylinder will help, and because flax is so small, it is not easily damaged. Flax's plant structure makes it difficult to chop and process, but some growers direct-combine the crop if it matures consistently. Combine carefully, as shattering can occur, especially in yellow-seeded varieties, which have thinner seed coatings.



Creating fiber from flax requires multiple processing steps and pieces of equipment, but can yield good, durable yarn. Flax can also be pressed for its oil, ground into flour, or used as a whole grain. The meal leftover after pressing flax can be fed to livestock and usually contains approximately 35% protein. (Note: the high levels of prussic acid in live flax plants make grazing green flax plants dangerous.) Clean seeds to eliminate weed seeds and plant debris, then dry to a moisture level of 11% or lower before long-term storage. Storage bins should be tightly-constructed, since flaxseed is very small.

References:

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