



LAKEVIEW ORGANIC GRAIN
Box 361, Penn Yan, NY 14527
315-531-1038 www.lakevieworganicgrain.com

Brassicas for Forage

Information from Ohio State University, Cornell University & Penn State University research

Forage brassicas are high quality, high yielding, fast growing crops that are particularly suitable for grazing by livestock. Both tops (stems plus leaves) and roots (bulbs) can be grazed and are very nutritious. Brassicas can be seeded (1) from mid April through May for summer grazing or (2) in July or August for fall/winter grazing. All members of the brassica (or cabbage) family - turnips, rape, kale, and swedes - produce forage of exceptionally high (often 85-95%) digestibility. Brassicas are valuable to produce high quality forage either (1) during the critical summer period of slowed pasture growth and/or (2) to extend grazing into the late fall-early winter period.

Turnips and rutabagas are short-season root brassicas that provide roots, stem and leaf growth for rotational grazing or strip grazing 70 to 90 days after seeding. The leaves can be grazed from mid- September until January depending upon critical low temperatures and snow cover. Top growth generally will survive temperatures between 15-20 degrees F, while bulbs will be about 5 degrees hardier. The common purple top garden type as well as Rondo, Pasja and other forage varieties, yield up to 7000 lb/acre of dry matter. The tops have 17-30% crude protein while roots contain 12-15% protein. Trials in New York in 2007 of Pasja turnip and oats produced forage with a average crude protein of 30.5 and a NEL of 0.74. Some new forage-type turnip varieties such as All Top produce relatively more top dry matter than roots. Turnips are seeded from mid July to mid August at rate of 2-3 lb/acre and produce maximum yields approximately 90 days after seeding. As long as the top of the root is not removed in the first grazing, turnips can be ready for regrazing in about 30 days.

Rape is a short-season leafy brassica whose stems and leaves are ready to harvest (rotationally graze, strip graze or green chop) 90- 120 days after establishment. Plants develop a reddish tinge when ready for harvest. Rangi, Windall, Dwarf Essex, Winfred and Emerald varieties have performed satisfactorily in Penn State University trials. Leaving a ten-inch stubble will facilitate rapid regrowth. Rape leaves and stems have lower protein level (14-17%) than turnips. Rapes can attain yields of 8000 lb/acre dry matter if planted during May or June. Rape can be planted as late as August 1, but with lower potential yield when planted late. Seed at 3-4 lb/acre rate.

Kale generally has shown highest yields of all brassicas with up to 12,000 lb/acre dry matter production at 150 days. It has the greatest cold tolerance in the Brassica family, surviving temperatures down to 10 degrees F. This allows grazing of the leaves and stems by rotational or strip grazing into December and January most years.

While brassicas have been successfully used for centuries in Europe and other parts of the world for livestock feed, the following precautions should be noted. Brassicas are very high in crude protein and energy, but extremely low in fiber. Their low fiber content results in rumen action similar to when concentrates are fed; thus the need for proper roughage supplementation. Brassicas therefore should never comprise more than two-thirds of the forage portion of livestock diets with the remainder provided by grass hay or stockpiled pasture. All brassicas contain low levels of glucosinolate compounds which can be toxic, but adequate grass forage supplementation seems to prevent them from causing animal health problems.

Following these 2 rules can help avoid health problems -

- Introduce grazing animals to brassica pastures slowly. Avoid abrupt changes from dried-up summer pastures to lush brassica pastures. Don't turn hungry animals into a new brassica pasture.
- Brassicas should not constitute more than 75 percent of the animal's diet. Supplement with dry hay if continually grazing brassicas or allow grazing animals access to grass pastures while grazing brassicas.

No-till establishment into existing sod will reduce the risk of these disorders because of grass in the brassica pasture. Nitrate poisoning has been documented from excessive nitrogen fertilization plus reported instances of high accumulation of calcium and potassium that can reduce the availability of magnesium to animals. Use feed analyses to check and modify mineral balance of animal diets. Excessive fertilization of both nitrogen and potassium should be avoided. Most dairymen have avoided off-flavors in milk by preventing brassica consumption two hours before milking. Others prefer to only feed rapes to lactating dairy animals when they also feed plenty of grass roughages.

Strip grazing where forage is rationed every day or two provides the most efficient usage. Rape, kale and mustard have regrowth potential if not grazed below six inches. Turnips will regrow if the growing point at the top of the bulb is not removed. Two or more cycles should be possible with rotational grazing if rainfall is adequate but brassicas can be green chopped and made into baleage for confined animals and winter feeding.

All brassica crops require good soil drainage and a soil pH between 5.3 and 6.8 for optimum production. Good stands can be established by planting 3.5 to 4 pounds per acre of kale or rape, or 1.5 to 3 pounds per acre of swede or turnip. The higher seeding rates are recommended for spring plantings. The seeds can be planted in rows 6 to 8 inches apart and not more than one-half inch deep, or be broadcast and incorporated into tilled seedbeds by cultipacking, or drilled. Brassicas can be planted with small grains, such as oats, for fall grazing. When preparing a tilled seedbed for brassica planting, plow the ground several weeks before planting to allow weed seeds to germinate before secondary tillage is completed to form a firm and fine seedbed that is free of weeds. Brassica can be no-tilled into pastures at lower seeding rates so a mixture of brassicas and grass is available for grazing with the grass cover retained to protect the soil during the winter. They also can be seeded with rye which will protect the soil after brassicas are consumed by animals.

Brassicas are not adapted to wet, poorly drained sites and grow best on well drained soils that have a pH between 5.3-6.8 and medium levels of phosphorus and potassium. Apply 50-75 lb/acre of nitrogen at time of seeding or within three days to hasten seedling emergence. Brassicas should not be grown on the same site for more than two consecutive years to prevent buildup of stand-threatening diseases. Brassicas planted after June will miss most of the usual cabbage insects.

Brassica crops can produce high yields of highly digestible forage during periods when perennial forages have limited production. In addition, the digestibility of the forage remains high over a relatively longer period than perennial crops. Few crops offer as much potential as do brassicas to improve livestock carrying capacity from August through December. Spring-seeded brassicas can be used to supplement low producing cool-season pastures or as insurance against summer drought. Summer-seeded brassicas can extend the potential grazing season by providing forage for fall and winter grazing. These characteristics make the use of brassica crops in grazing situations very flexible and appealing to producers utilizing pastures in their livestock operation.

Mangels are not brassicas, but are more closely related to sugar beets, Mangels have been used traditionally for winter animal feed in Europe, but because of the hand labor involved in harvest and preparation for feeding, they are rarely used these days. However, they are an excellent, economical source of feed that would be quite possible for smaller farms.

Mangels, harvested in late fall, weigh from 4 to 6 pounds, about 12 per cent of solids with about 6 per cent of sugar. Mangels can be left in the field after a light frost, but will rot quickly in the ground after a hard frost. Mangels are usually planted in rows ranging from 28 to 36 inches apart; the rate of seeding is from 6 to 8 pounds to the acre. The seed is covered about 1 inch deep, or deeper if necessary to insure moisture for germination. Seeding should be done as soon as the ground is in good condition, usually during the first weeks of May.

Mangels can be pulled easily by hand. The tops are then twisted or cut off and the beets thrown into piles from which they are loaded into wagons and hauled to the root cellar or pit for storing. The tops may be thrown into windrows for curing, as they make excellent feed for cattle, sheep, and hogs.

The dry matter in mangels is equal in feeding value to the dry matter in grain and is somewhat higher than that in silage. It is palatable and nutritious, and an unusually high proportion of it is digestible. Mangels are most commonly fed to dairy cattle, though they may be fed to sheep and hogs if desired. A yield of 10 to 15 tons/acre of mangel roots is possible.