

Brassica Crops To Extend Grazing Season



Forage brassica crops collectively include turnips, swede, rape and kale. These are annual crops which are highly productive and digestible and can normally be grazed 80 to 150 days after seeding, depending on the species. For forage they have become popular to supplement cool season perennial grass and grass-legume pastures that normally become less productive as the grazing season advances from June to November. Again, depending on the species, both tops (stems plus leaves) and roots (bulbs) can be grazed and are very nutritious.



Recently the brassicas have become extremely popular as a grazing crop for wildlife, especially deer. They are also considered excellent to provide wildlife their critical high carbohydrate fall diet needs.

Brassica Species

Below is a brief description for each of the four brassica species marketed in the Northeastern states and eastern Canada.

Rape (Brassica napus L.)

Rape is a short-season annual leafy brassica whose stems and leaves are ready to harvest (rotationally graze, strip graze or green chop) about 120 days after establishment. It's a good supplemental or emergency pasture for sheep or hogs, but caution should be used in feeding rape to milking cows as rape has a tendency to flavor milk.



Forage rape produces a taproot that, unlike turnips, cannot be harvested by grazing animals. However it can be grazed and allow to regrow and graze again. Rape can be planted during May or June for maximum yield. It can be planted as late as August 1st, but forage yields will

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be reduced. Under favorable conditions rape can produce forage yields of 10 to 15 tons per acre. (3000 to 5000 lbs. dry matter per acre.).

Forage rape is best utilized in a strip grazing program. Both cattle and sheep should be introduced gradually to this crop, and between grazings have access to other pasture or hay.

Varieties of rape marketed by Preferred Seed include: Interval, Hobson and Dwarf Essex.

Kale (Brassica oleracea L.)

Kale, like rape, is grown for its leaves and stems. It is highly palatable and high in protein and can be fed fresh to most classes of livestock. Because of its cold tolerance it can be rotationally grazed well into the fall.

Kale is one of the highest yielding brassicas, producing up to 5 or more tons per acre of dry matter at 150 days, making it ideal for dairy or beef cattle especially for late season forage. It can be seeded from early spring to mid July. Kale varieties marketed by Preferred Seed include: Caledonia, Keeper and Penfold.



Turnips (Brassica rapa L.)

Turnips grown for forage are short-season root brassicas that provide roots (bulbs), stems and leaf growth for rotational or strip grazing 70 to 90 days after seeding. Selection for use as forage has resulted in changes in root set, and, because leaves are higher in nutritional value than roots, new plant selections have been developed to increase the leaf-to-root ratio.

Within the turnip family there are several different types. However, as a thumb rule turnips should be sown 60 to 70 days before tops are to be grazed and 12 to 14 weeks before roots are to be utilized. Depending on sowing date a single acre of well grown turnips can produce in excess of 20 tons of fresh yields of leaves and roots combined. Turnips maintain their feed value for a relatively long period of time and can be grazed long after the plants have matured. Both cattle and sheep will graze the leaves first and then the roots.



Turnip varieties marketed by Preferred Seed include: Appin (high leaf to bulb-ratio), Dynamo (globe type), Sampson (tankard type) and Hunter.

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Swede (Brassica napus L.)

Like turnips, swede produces a large edible root. Swede yields are generally higher than those of turnip, but growth is slower and requires 150 to 180 days to reach maximum production.

At this time no varieties of Swede are marketed by Preferred Seed.

Table 1 summarizes the characteristics and suggested seeding rate for the various brassica forage crop.

Table 1

Crop	Plant Part Consumed	Seeding to Harvest (days)	Regrowth After Harvest	Seeding Rate (pounds per acre)
Kale	Herbage	150 to 180	No ^a	3.5 to 4
Rape	Herbage	80 to 90	Yes	3.5 to 4
Swede	Herbage and root	150 to 180	No	1.5 to 2
Turnip	Herbage and root	80 to 90	Yes	1.5 to 2

^a An exception is the stemless variety 'Premier' which is ready for harvest 80 to 90 days after seeding and will regrow after harvest if not grazed below 3 to 4 inches.

Establishment and Management Suggestions – General

Establishment

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 2 pounds per acre of swede or turnip. The higher seeding rates are recommended for spring plantings. The seeds should be planted in rows 6 to 8 inches apart and not more than one-half inch deep. However, brassica seed can also be broadcast and incorporated into tilled seedbeds by cultipacking. 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. In addition, the preplant incorporated herbicide, Treflan (Trifluralin), is labeled at 0.5 to 1.0 pint active ingredient per acre for control of annual grass and small seeded broadleaf weeds in brassicas.

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Brassica stands can also be established by no-till planting in grass sod that is suppressed with paraquat or glyphosate herbicides. Read pesticide labels and precautions before using either of these herbicides. Ideally, the grass sod should be grazed through June with the grazing prior to brassica seeding being very close. Approximately two weeks before planting the herbicide should be applied to the grass sod. Another option for no-till establishment would be to apply a manure slurry to the sod, to burn the sod back, and then no-till plant the brassica seeds through the slurry. In addition to reduced erosion concerns with no-till planting, there are generally fewer insect problems than with conventionally seeded brassicas. The following recommendations will improve the chances of successful brassica establishment.

1. Attempt establishment only on well drained soils.
2. Do not seed deeper than one-half inch.
3. When seeding into a sod, suppress the sod long enough to allow the brassicas to establish (two to three weeks).
4. Apply 75 pounds of nitrogen at seeding to stimulate establishment and growth.

As previously mentioned, forage brassicas can be grown to supplement perennial cool-season pastures in August and September or to extend the grazing season in November and December. In the first instance, brassicas would be planted in May or early June because spring rains will help assure production for August and September grazing. Turnip, rape, or stemless kale could be used for this purpose. In the second instance, swede or kale would be planted in spring, or rape, turnip, and turnip hybrids would be planted in late July or early August, and growth allowed to accumulate until November or December.

Management

Fertilization

Phosphorus and potassium soil test levels should be in the optimum range prior to planting. If the phosphorus level is below 55 pounds per acre, the application of phosphorus during brassica development may be warranted. Applications under this condition tends to increase yield if nitrogen is not limiting growth. However, phosphous applications decrease crude protein concentration of the brassica forage.

In addition to the nitrogen applied at planting, when multiple grazings are planned, an additional 70 pounds should be applied between 60 and 80 days after seeding to increase yield and crude protein level of the brassica tips. Unfortunately, the nitrogen induced yield increase in turnip and swede tops causes a reduction in root yield. When seeding into a suppressed grass sward, nitrogen application tends to increase the efficacy of the suppressing herbicide and reduces the proportion of grass in the brassica-grass sward.

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Grazing

Brassicas can be harvested for greenchop or silage but are most frequently grazed. Grazing management is important to optimize the true potential of these crops. Strip grazing small areas of brassica at a time provides the most efficient utilization. Grazing large areas increases trampling and waste of the available forage. Rape is more easily managed for multiple grazings than are the other brassica species. Approximately 6 to 10 inches of stubble should remain after grazing rape to promote rapid regrowth. Regrowth may be grazed in as few as four weeks after the first grazing. Graze rape close to ground level during the final grazing.

When turnips are to be grazed twice, only the tops should be grazed during the first grazing. Turnip regrowth is initiated at the top of the root, so this part of the plant should not be removed until the second and final grazing when the whole plant can be consumed. Like rape, regrowth of turnips can be sufficient to graze within four weeks of the first grazing.

Pests

Diseases such as bacterial soft rot of brassica roots and leaf spot are generally not a problem until the plants near maturity. Stockpiling (delaying grazing until a date later than plant maturity) should not be attempted in fields where brassicas have high levels of foliar disease at maturity. Research has shown yield reductions of 40 percent when disease infected brassica crops were stockpiled for 45 days. To reduce disease occurrence, brassicas should not be grown on the same field for more than two consecutive years.

Insects that feed on brassicas, such as aphids, flea beetles, and imported cabbage worms, are not a consistent problem in the northeast. However, appropriate use of insecticides may be warranted if insect populations become severe.

Once established, brassicas are very competitive with weeds. However, precautions should be made at planting to reduce weed competition during brassica establishment.

Yield and Nutritional Value

Brassica dry matter yield will depend on the production potential of the soil and environment, and the brassica species. Average yields in Pennsylvania trials have been 3.1 tons of dry matter per acre at 90 days after planting. Slower maturing kale and swede average over 4 tons per acre at 120 days after planting. For a grazing situation, an average carrying capacity of a good brassica stand would be approximately 1,550 ewe-grazing or 160 cow-grazing days per acre.

Dry matter digestibility generally exceeds 90 percent for all plant parts except kale stems at maturity. By comparison, dairy quality alfalfa hay is approximately 70 percent digestible. With adequate fertility, brassicas can produce amounts of digestible energy per acre equivalent to corn yielding 115 bushel per acre. Unlike perennial forage crops, the dry matter digestibility of brassicas does not decrease markedly with increasing plant maturity. This characteristic makes them ideal for stockpiling. Ruminant diets should not contain more than 75 percent brassicas forage because the fiber content of brassica crops is too low for maintenance of proper rumen activity. With their high digestibility and low fiber content, brassicas should

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actually be considered as “concentrates” rather than “forage” in nutritional planning for livestock. Crude protein concentration of brassicas ranges from 8 to 10 percent in turnip roots to 30 percent in rape leaves.

Feeding Concerns

Brassica crops can cause health disorders in grazing animals if not managed properly. The main disorders are bloat, atypical pneumonia, nitrate poisoning, hemolytic anemia (mainly with kale), hypothyroidism, and polioencephalomalacia. Researchers have discovered that these disorders can be avoided by adhering to two management rules:

1. Introduce grazing animals to brassica pastures slowly. Avoid abrupt changes from dry summer pastures to lush brassica pastures. Don't turn hungry animals that are not adapted to brassicas into a brassica pasture.
2. Brassica crops 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.

Summary

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 brassica crops 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.

Adapted with permission in part from Agronomy Facts 33 prepared by Dr. Marvin Hall, professor of Agronomy, and Dr. Jerry Jung, adjunct Professor of Agronomy (retired), The Pennsylvania State University. Originally published in 1992.

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