

Rutabagas

Cultivars

The recommended rutabaga cultivars are the Laurentian strains. Contact Manitoba Agriculture and Food's Vegetable Specialist for more variety recommendations.

Climate and Soil Requirements

Rutabaga is a cool season crop which produces best with temperatures ranging from 5° to 24°C with an optimum of 15° to 18°C.

Rutabagas produce best on soils that are clay, silty or sandy loam in texture with pH of 6.5 to 7.0. The optimum soil temperature for germination is from 16° to 29°C. Heavy clay soils should be avoided.

Seeding and Spacing

Early Crop: There is a limited market for early rutabagas seeded in May. Seeding is recommended when soil temperatures are at least 5°C and possibility of heavy frosts is low.

Storage (Main) Crop: Seeding is recommended during the second to third weeks of June.

Row Spacing: 24-36 inches (60 – 90 cm)

In-Row Spacing: 5-6 inches (13 – 15 cm)

Depth: 0.5 inch (1.5 cm)

Rate: approx. 7 oz. of seed/acre

Fertility

Refer to Tables 1 through 9 for this crop. For general recommendations in the absence of a soil test, refer to Table 10 in the fertility section.

Secondary and Micronutrients

Boron

Water-core or brown heart may be caused by boron deficiency and first appears in young, enlarging roots as firm, brownish, water-soaked patches. These may increase in size until almost the whole rutabaga root is affected. Severely affected rutabagas may turn punky inside during storage.

Boron deficiencies often occur during dry weather. However, the response to boron is often inconsistent. As a result, it has not been possible to develop a reliable soil test. Visual symptoms and tissue analysis are useful for predicting boron requirements in plants.

Boron can be applied to the soil before sowing. The necessary quantity of boron can be mixed pre-plant fertilizer applications. Boron-enriched fertilizer should be applied as uniformly as possible.

Application of boron to mineral soils has not been universally successful.

Foliar applications of Solubor are often more effective than soil applied boron. The first foliar application should be made when the roots of the plants are about 0.6-1.0 inch (1.5 – 2.5 cm) in diameter. The second and third applications may be applied at 10- to 14-day intervals after the first spray.

Boron should be used with care. There is a fine line between adequate and toxic levels.

Do not combine pesticides with boron sprays unless the label specifies compatibility. Excessive applications of boron will often adversely affect the succeeding crop in the rotation (e.g. soybeans, snap beans, white beans and small grains).

Pest Management

Diseases

Damping-Off

Refer to Seed Treatment page in the Fungicide/Bactericides Section of the *Guide to Vegetable Crop Protection 2003*.

Black Rot and Blackleg

Treat seed with products recommended in the Fungicide/Bactericide section of the *Guide to Vegetable Crop Protection 2003* for control recommendations.

Do not plant rutabagas, canola, kale, cabbages or other crucifers more than once in four or five years on the same land. The blackleg pathogen can move with wind and water from adjacent fields that grew a cruciferous crop, including canola, in the previous year. Control cruciferous weeds.

Do not apply manure containing rutabaga refuse or diseased rutabagas on land intended for rutabagas. Do not work in the field when plants are wet. Never store diseased rutabagas. Clean out and disinfect the storage area each spring.

Refer to the Storage Sanitation paragraph for more information.

Powdery Mildew

The cultivar Laurentian is very susceptible to powdery mildew. The fungus spreads by means of conidia (spores), which are carried long distances by wind. Disease spread occurs rapidly during hot, dry weather. Control must be initiated at the first appearance of symptoms, which are white, circular or star-shaped spots on older leaves and stems.

Refer to the Fungicides/Bactericides section in the *Guide to Vegetable Crop Protection 2003* for control recommendations.

Insects

Cabbage Root Maggot

Cabbage root maggots overwinter as pupae in the soil in fields where they developed during the previous season. Follow a three-to-four-year crop rotation and plant early rutabagas as far as possible

away from fields used for rutabagas or cole crops last year. Do not grow early and late rutabagas in the same field or near canola, early broccoli, cabbage or cauliflower.

In Manitoba, cabbage maggot flies are active from as early as late May through to September. Without control, severe maggot damage to the crop will occur. Refer to the Insecticide Section of the *Guide to Vegetable Crop Protection 2003* for control recommendations.

Flea Beetles

These insects can be controlled only in the adult beetle stage. There is no control for larvae established in roots. A spray should be applied as soon as the beetles appear in the field. Because beetles may migrate into the field over several weeks, a number of applications may be required.

If insecticide drenches are used to control root maggots, flea beetles may also be controlled. If drenches are not applied before seedling emergence and seedlings are attacked when they come up, or if beetles are numerous during the growing season, spray with one of the materials recommended in the Insecticide Section of the *Guide to Vegetable Crop Protection 2003*. To limit development of resistance, alternate between insecticide groups for each application.

Aphids

If monitoring indicates a threat to the crop, spray with one of the insecticides recommended in the Insecticide Section of the *Guide to Vegetable Crop Protection 2003*. These insecticides are not likely to be effective against aphids if combined with boron sprays.

Leaf-Eating Caterpillars

If cabbageworms, diamondback moth larvae and cabbage loopers are numerous, spray with one of the pesticides recommended in the Insecticide Section.

Cutworms

Several species of cutworms attack vegetables. Dark-sided, red-backed, black and glassy cut-

worms normally appear in June. Depending on soil and climatic conditions, these species will attack the plants below or at the soil surface. The variegated cutworm, which is a foliage feeder, usually causes late-season damage.

Effective cutworm control is dependent on proper timing of insecticide applications under favourable soil and climatic conditions. Many of the insecticides registered for cutworm control are short-residual and break down quickly in sunlight.

Most species of cutworms go into the soil during the day and come out to feed at night. Insecticide applications should be made in late afternoon or early evening, just before the insects come up to feed. Insecticides are more effective on moist soil than on dry soil.

Weeds

Competition from weeds can reduce yield and also make harvesting more difficult. For recommended herbicides refer to the *Guide to Vegetable Crop Protection 2003*.

Harvest and Storage

If possible, harvest when weather is cool and avoid bruising. Roots will store up to seven months if temperatures are held at 0°C and a relative humidity of 95%. Remove field heat as rapidly as possible to prevent shrinkage and discoloration. Do not soak pile with water.

Adequate ventilation and air movement throughout the bulk pile of roots is necessary.

Clean the storage area thoroughly in the spring. To disinfect the area, spray all surfaces with a mixture of 2.2 lb (1 kg) of copper sulfate (bluestone) and 4.4 lb (2 kg) of hydrated lime, dissolved in 11 gal (50 L) of water. Add the lime last. Since this mixture is corrosive to metals, cover metal fixtures such as fans, electrical control equipment, etc., during the spraying operation. An alternative disinfectant spray is a 200 ppm solution of calcium hypochlorite. In addition, there are also other commercial disinfectants listed below.

Washing, Trimming and Waxing

Washing: Dirty water contains large numbers of rot-causing organisms. To reduce loss from disease after waxing, change the water in the wash tank frequently or add fresh water continuously to keep water as clean as possible. Then rinse rutabagas with clean water and dry them as rapidly as possible before waxing or shipping. Trimming after washing helps reduce rot in waxed rutabagas. Calcium hypochlorite in the rinse water has shown to be effective in reducing losses after waxing.

Trimming: When preparing roots for market, the top should be removed at the crown. Trimming into the crown should be avoided. Remove side rootlets and the main tap root below the enlarged area of the root.

Waxing: Rutabagas are normally hot-waxed just before being marketed. Waxing improves their appearance, keeps them clean, protects freshly trimmed surfaces from disease organisms and prevents undue moisture loss and shrinkage during the marketing period. Waxing is not recommended for rutabagas being held in storage. Immerse clean, dry rutabagas for one second in a “rutabaga/turnip” wax at 126°C and then pack as desired for market. Temperatures must be kept low after waxing as rutabagas can spoil within a few days at room temperature.

Storage Sanitation

Cleaning and sanitation in horticultural storage and packing areas to eliminate disease-causing organisms is extremely important. A good sanitation

program involves three steps: cleaning, disinfecting and rinsing.

Cleaning includes removing debris, such as soil, wood, stones, and metal, by brushing, vacuuming, scraping and high-pressure washing. Cleaning compounds such as soaps can be used to lower the surface tension of water so that soils may be loosened and flushed away.

Cleaning must be done before disinfecting. Dirt and residue will prevent the disinfectant from coming into contact with all surfaces. Many common disinfectants are deactivated by organic matter.

Proven Disinfectants	
Sanitizing Compound	Mixing Rate With Water
Hypochlorites (bleaches ^{1,2} 5.254.0% active)	1 part to 9 parts water
Quaternary ammonium (10% active) e.g. DCD	1.0 mL per 300 mL water
Phenolic compounds ³ (sold as hospital disinfectants)	See label. Use rate listed for heavy spills
37% Formain solution ²	3 L per 100 L water

¹ Corrosive to metal surfaces.

² Wear a suitable respirator. Ventilate following treatment. Fumes are toxic to plants.

³ Provides residual action.