

Garlic

Cultivars

Most cultivars tested in Manitoba exhibited a wide range of yield variability and overwintering success. Cultivated garlic plants do not produce true seed. Two types of garlic are grown and are described as hardneck or softneck. All garlic is propagated vegetatively. Contact Manitoba Agriculture and Food's Vegetable Specialist for variety recommendations.

Climate and Soil Requirements

Garlic can be grown on a wide range of soil types providing that the soils are well-drained, deep and fertile. Soils with good organic matter content are preferred due to the increased moisture and nutrient-holding capacity. Extremely heavy soil types should be avoided. Soil pH should range from 6.0 to 7.5.

Planting and Spacing

The optimum planting date is from September to late October with October 15 being ideal most years. To estimate the planting date, use the average date for the first fall frost for the area in which garlic is to be grown and begin planting on this date.

Row Spacing: 8 inches (20 cm)

In-row Spacing: 3-5 inches (7 – 12 cm). Use wider spacing in lighter, drought-prone soils

Rate: 700 – 892 lb/acre

Depth of Planting: Allow for 1-2 inches (3-5 cm) between the soil surface and the top of the clove.

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.

Nitrogen

On mineral soils, a total of 98 lb/acre is required. Calcium nitrate or ammonium nitrate are the preferred sources. Half of the nitrogen should be ap-

plied as soon as the garlic plants begin to grow in the spring. The rest of the nitrogen should be applied in two-to-three side dresses at a three-week intervals.

Phosphate and Potash

Use a soil test to establish pH, phosphorus and potassium requirements. Amend phosphorus and potassium levels prior to fall planting. Phosphorus and potassium requirements are similar to those for onions.

Irrigation

Garlic is shallow-rooted and is sensitive to moisture stress. For most soil types approximately 1 inch (2.5 cm) of water is required per week. On very dry, sandy soils, as much as 2 inches (5.0 cm) is required weekly.

Pest Management

Diseases

Green Mould Disease

Green mould disease, caused by the fungus *Penicillium*, attacks cloves which have been damaged prior to planting. Affected cloves may fail to emerge in the spring, or may produce weak, stunted plants which soon die.

Plant only clonal cultivars known to be vigorous under Manitoba conditions. Avoid damaging the seed cloves, especially during the cracking procedure. Many mechanized cracking devices cause excessive amounts of clove damage. Crack the seed immediately before it is to be planted. Cracked cloves may be treated with a fungicide treatment.

Basal Rot

This soil-borne *Fusarium* disease prefers warm soil temperatures and is common in Manitoba. Early symptoms include yellowing and tip die-back. As the disease progresses, the plant will collapse, the roots will decay and the basal plate will

have a pinkish colour. Secondary rots often follow. Crop rotation and the use of disease-free transplants are recommended.

White Rot

Onion white rot disease is a serious threat to garlic production. Fortunately, the incidence of White Rot in Manitoba has been extremely low.

The fungus survives as sclerotia in the soil for long periods. Long-term rotation with carrots, lettuce, potatoes or other crops not related to the onion family is recommended. Rotations of 10 to 20 years may not reduce the population of white rot in heavily infested soil.

Cultural control recommendations such as flooding of fields or field solarizations with clear plastic are not practical for large scale onion production in Manitoba.

Sanitation is extremely important in preventing the spread of this disease. Wash down machinery after it has been used in an infested field. Avoid cultivation practices that can spread contaminated soil from one area to the rest of the field. Dispose of cull garlic in a sanitary landfill or bury away from areas of garlic production. Pallet boxes that have been used to hold contaminated soil or diseased garlic may also be a source of disease and should be cleaned or destroyed.

Insects

Onion Maggot

Compared to other major vegetable producing areas in North America, the population density of the onion maggot fly is relatively low and usually below control thresholds levels. Several years of studying and field monitoring of the onion maggot indicates population peaks occur generally in late June – mid-July and then again in mid-to-late August.

However, population densities in south-central Manitoba (Morden, Winkler, Plum Coulee areas) have exceeded control thresholds more often over the years as compared to the Portage la Prairie area.

Consult Manitoba Agriculture and Food's Soils and Crops Branch for more information on scouting and control threshold levels for onion maggot fly.

Proper placement of granular insecticides at the correct rate is the key to onion maggot control. If difficulties are encountered with the granular application, spray to kill the flies may reduce their numbers. However, evidence suggests that sprays for flies do little to reduce overall damage from maggots in cooking onions and Spanish onions.

Garlic left in the field after harvest are a major source of overwintering onion maggot. This is especially true following early harvest of Dutch sets and pickling onions. Prevent all regrowth and rogue out all volunteer garlic early in the season. Incorporate residue immediately after harvest.

Thrips

Monitoring greatly improves the management of thrips on garlic. First, estimate the average leaf stage of the crop, then check at least 50 to 100 plants randomly in the field and record the average number of thrips per plant. Divide by the leaf stage to give the number of thrips per leaf.

Thresholds for garlic is 1 trips/leaf..

Evidence suggests that thrips may develop high levels of resistance in garlic fields where repeated use of insecticides occur. Rotate with different chemical groups where possible. Hot, dry weather favours thrips infestations. Water volume, coverage and timing are critical.

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*.