

Squash and Pumpkin

Cultivars

Contact Manitoba Agriculture and Food's Vegetable Specialist for variety information.

Climate and Soil Requirements

Squash and pumpkins are frost tender, thriving only if weather is warm. Delay seeding and transplanting until late May or early June when soil temperatures are 16°C or higher.

Squash and pumpkins can be produced successfully on a wide range of well-drained soil types.

Transplants

Approximately 25 lb of seed is required to produce transplants for 2.5 acres. Direct plant into 128 cell trays three to four weeks prior to field transplanting. Do not damage root mass when pulling plants from trays.

Seed Treatments

Treat seed with a fungicide prior to seeding to control damping off and seed decay.

Seeding and Spacing

Squash and pumpkins can be transplanted for early crops or direct seeded into the field.

Direct Seeding

Most commercial crops are direct seeded in Manitoba. Quick, uniform emergence is essential to avoid uneven stands weakened by insects and disease. Delay seeding until soil temperature is 16°C. Soil temperatures between 25 to 35°C are ideal for fast, uniform germination.

Direct Seeding Rates for:

Standard types - 2-4 lb/acre

Semi-bush type – 3-4 lb/acre

Small bush type – 4-6 lb/acre

Spacing

Standard types:

In Row – 4-5 ft (120 – 150 cm)

Between Rows – 5-10 ft (1.5 – 3 m)

Semi bush type:

In Row – 1.5-2 ft (45 – 60 cm)

Between Rows – 4-5 ft (1.2 – 1.5 m)

Small bush type:

In Row – 1.5-2 ft (45-60 cm)

Between Rows – 3-4 ft (0.9 – 1.2 m)

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.

Irrigation

Good moisture is necessary throughout the growing season. Irrigate to supply 1 inch (2.5 cm) water after seeding or transplanting. Good moisture reserves are also necessary at time of flowering and fruit development. Do not let soil dry out during this period. Irrigate in the late afternoon to avoid bees working the field.

Pollination

All vine crops depend on insects to transfer pollen from male to female blossoms. Each female blossom must be visited 15 to 20 times in order for adequate pollination to occur. Poorly pollinated fruit will usually exhibit awkward shape and poor size.

In small plantings, there may be enough native pollinating insects to perform this function. In large plantings, the grower is advised to introduce one colony of honeybees for every two to three acres. Plan to have the hives in the field at first bloom.

Insecticides will poison bees. Spray only in the evening or at night, after bees have finished foraging for the day. If possible, remove hives from the field prior to spraying.

Pest Management

Diseases

Damping-Off

Treated seed will help prevent damping-off, seedling blight and seed decay. Use a registered fungicide for control, refer to the *Guide to Vegetable Crop Protection 2003*.

Use sterile soil or soilless mix for growing seedlings.

Angular Leaf Spot

It is not possible to completely control this disease with fungicides. A reduction in disease severity may be achieved by spraying with a copper fungicide. Repeat at weekly intervals in wet weather. Do not work in crop when foliage is wet.

Bacterial Wilt

This disease overwinters in the stomachs of adult cucumber beetles. Plants become susceptible as soon as the beetles emerge in the spring. Bacterial wilt moves in the vascular system of infected plants. As a result, there is no effective treatment. Beetle control is essential for effective bacterial wilt control. Cultivars vary in their susceptibility to bacterial wilt.

Cucumber Mosaic (Virus)

This virus is transmitted by aphids and cucumber beetles. Transmission occurs very quickly (in less than one minute). As a result, aphid control will not necessarily prevent an infestation. Use of resistant cultivars is the best means of preventing yield losses.

Alternaria Leaf Spot

This disease is often prevalent in muskmelons. The oldest leaves are infected first. Sprays applied to control scab and anthracnose are somewhat effective at controlling Alternaria.

Scab

This disease is more prevalent during cool weather conditions. It requires the occurrence of frequent rains or heavy dews. Fungicide sprays are not always completely effective at controlling scab. Plant cultivars resistant to scab, if they are available. Follow a two-year rotation away from all vine crops.

Anthracnose

Use resistant varieties where possible and follow a two-year rotation away from vine crops. Begin fungicide applications at the first sign of disease or if weather conditions are favourable (cool and wet). Spray with one of the recommended fungicides in the Fungicide/Bactericide section of the *Guide to Vegetable Crop Protection 2003*.

Powdery Mildew

This disease generally appears in late July to early August. In all vine crops, severe infections can reduce yield.

As soon as mildew appears, apply one of the fungicides recommended in the Fungicide/

Bactericide section of the *Guide to Vegetable Crop Protection 2003* at 8 to 10-day intervals. Look for new powdery mildew-resistant varieties on the market.

The sugar content in squash may be reduced in plants infected with powdery mildew. In pumpkins, mildew will cause the stems (handles) to break down prematurely.

Insects

Seedcorn Maggot and Wireworm

Maggots are usually a problem in direct-seeded crops during cool, wet springs when germination is delayed. The maggots feed on the swollen, ungerminated seed.

Adult flies lay their eggs from April until the middle of June. The females are attracted to moist soils that give off an odour of decaying organic matter. Fields with high residue levels or where manure has recently been applied are good potential egg-laying sites. Apply and incorporate manure well in advance of planting.

Wireworm is more likely to be a problem for the first two years following sod. Controlling wireworm is difficult and may take several growing seasons. Slow-emerging crops are more vulnerable to wireworm damage. Plant into well-prepared, warm soils. Avoid unnecessarily deep planting depths.

Squash Vine Borer

Fleshy, white larvae feed inside the stems and fruit of gourds, pumpkins and squash. This pest is rarely a problem in commercial fields as borers are generally controlled by cucumber beetle sprays. If a problem occurs, spray the base of plants thoroughly with one of the insecticides recommended.

Striped Cucumber Beetle, Spotted Cucumber Beetle

Beetles usually arrive in cucurbit fields as the crop begins to emerge. They can cause significant damage to young seedlings. Beetles must be controlled to prevent the transmission of bacterial wilt.

Spray when beetles first appear in the field. A general guideline is to treat when beetles exceed 0.5 to 1 per plant. A follow-up spray may be necessary, as beetle emergence is often staggered.

Cucumber beetles tend to congregate in certain areas of the field, making them an excellent candidate for spot spraying.

Aphids

Begin monitoring for aphids in late June, especially during hot, dry weather conditions. Aphids are vectors of virus diseases. Focus monitoring efforts on runners. If monitoring indicates a need, spray with one of the registered pesticides recommended in the Insecticide section of the *Guide to Vegetable Crop Protection 2003*.

Leafhoppers

Feeding damage plugs the vascular system, causing hopper burn. Hopper burn is frequently mistaken for drought stress. If hoppers are found feeding in the crop, refer to the insecticide tables in the *Guide to Vegetable Crop Protection 2003* for recommended control products.

Squash Bug

The squash bug is primarily a pest of pumpkin, squash and zucchini but can be found on any cucurbit crop. The squash bug overwinters as an adult in sheltered areas and emerges during mid-summer. Crop rotation and field sanitation are the best methods for managing this pest.

Two-Spotted Spider Mite

Mites move into the crop from grassy field margins. A well-timed border spray will often provide efficient control. This pest is often more prevalent in hot, dry summers. If monitoring indicates a need, refer to the insecticide tables in the *Guide to Vegetable Crop Protection 2003*.

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*.

Curing and Storage

Curing the fruit for 10 to 20 days at 24°–27°C can decrease its higher water content and improve its eating quality. Butternut, Hubbard and Delicious cultivars respond to this treatment, but storage life may be shortened. Curing acorn-type squashes decreases the storage life and eating quality.

Maintain storage temperatures between 10°–15°C. Pumpkin and squash are susceptible to cold injury, which appears after the fruit has been brought to room temperatures.

Maintain relative humidity at 50 to 70%. Very high humidity levels will increase storage rots,

while dry conditions will increase weight loss and shrinkage. Weight loss should be kept below 15%.

Pumpkin and Squash Storage Expectancy

Pumpkin: 8-12 weeks

Squash: *Acorn:* 4-7 weeks
Butternut: 8-12 weeks
Buttercup: 10 weeks
Turban: 12 weeks
Hubbard: 6 months

Tomatoes

Cultivars

Contact Manitoba Agriculture and Food's Vegetable Specialist for variety information.

Climate and Soil Requirements

Tomatoes are a warm-season crop. Tomatoes must be set out in the field as transplants after all danger of frost has passed. By using plant protectors (Hot caps, Walls o' Water, plastic tunnels, etc.), plants can be set out somewhat earlier.

Tomatoes require direct sunlight for optimum production. Tomatoes do not thrive in cold weather or extreme heat. Fruit set will not occur at prolonged temperatures below 14°C or above 30°C.

Tomatoes will produce good yields on a wide range of fertile, well drained soils with pH of 5.5 – 7.5.

Seed Treatment

Seed treatment with a registered fungicide is necessary to prevent seed decay and damping-off.

Hot water treatment is an effective, non-chemical method to reduce bacterial and fungal pathogens on seed. It is particularly important for the control of bacterial diseases of tomatoes, peppers and cole crops.

Tomato seed can be treated at 54°C for 25 minutes. Plant seeds within a few days of treating.

Tomato seed can also be treated by soaking dry seed in three parts of 0.6 Molar hydrochloric acid (i.e., mix one part acid with 19 parts of distilled water) for one hour with frequent agitation. Drain the acid, thoroughly rinse in distilled water and dry. A 0.1 Molar hydrochloric acid (available from scientific supply companies) can also be used to soak the seeds for one hour with frequent agitation and, in this case, the seeds can be dried without rinsing in water.

Transplants

Use treated seed (3 ounces of seed required for 10,000 transplants) and a sterile planting media in 128 to 288 cell trays. For early market tomatoes transplant to 24 – 50 cell trays after first true leaf has developed. Time required to produce field ready transplants is five to eight weeks. Optimum temperature for germination 29°C with night temperatures of 15°–18°C.

Prepare transplants for the harsher environment of the field by hardening them off. Warm season crops should not be hardened at temperatures below 13°C.

Watering of the transplants can be reduced to let the plants wilt slightly, as part of the hardening