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GARLIC PRODUCTION IN ALBERTA

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Crop Physiology and Variety Selection

Garlic produces no true seed and it cannot be crossed or hybridized. It is propagated by replanting individual cloves that make up the bulbs. Size of individual cloves has a direct influence on the size of bulb that will be produced and therefore only large cloves should be planted.

Bulbing occurs at approximately the same time no matter when garlic is planted. An internal clock governed by day length triggers bulbing. Leaf production stops when bulbing starts, therefore the more leaves present the bigger the potential bulb. Late planting results in small bulbs or onion-like bulbs without cloves.

Cultivars currently on the market are not generally known or identified by a specific name, however, they are identified as to bulb type. Only one type should be considered for commercial production and that is the Italian form of garlic which is smaller in size and can be white (early maturity) or pink (late maturity) in color. Elephant garlic which is much larger is relatively new on the market and is not well accepted because of its sweeter and milder flavor. Time will change demand for the milder form which has jumbo sized cloves and easier to use.

In Alberta where the growing season is relatively short, early maturing cultivars should be planted in the spring. With fall planting, late maturing cultivars should be planted. Planting an early cultivar in the fall results in bulbing that occurs too early the following season and the result is a poorly developed bulb.

Planting Stock Source

Planting stock (bulbs) should be purchased only from reputable suppliers. At present, Richters of Goodwood, Ontario, LOC 1AO (phone: 416/640-6677) is one bulk supplier in Canada. Based on 1987 prices, 10 kg of planting stock costs $140.00. Planting stock should not be purchased from wholesale houses as it may have been treated with a sprout inhibitor. Planting stock is also available from Hutterite colonies and a limited number of commercial growers in the province. Current prices run from $1.50 to $2.00 a pound, $3.00 for elephant garlic.

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Soil and Fertilizer

Any soil that is suitable for the production of vegetable crops will also meet the requirements for growing of garlic, although higher organic matter soils are preferred. Garlic does not need very high quantities of plant nutrients, 60 to 80 pounds of nitrogen and 80 pounds of phosphorus per acre are adequate for a good yield of garlic. Either 16-20-0 or 23-23-0 are good nitrogen and phosphorus fertilizers to broadcast and incorporate prior to planting.

In central and northern Alberta, cooler temperatures and long days tend to encourage more vegetative growth with the result that maturity is delayed. In

these areas, nitrogen levels must not exceed 50 pounds per acre and a nitrogen supplement of 20 pounds per acre should be applied before the end of June only if required.

Planting

Normally, garlic cloves are planted 3 to 6 inches apart in the row at a depth of 2 inches with row spacing being 15 to 24 inches apart. Higher yields were obtained when the in-row spacing is reduced to 2 inches and inter-row spacing to 12 inches. Pounds of cloves required to plant an acre will vary from 600 to 1,000 depending on row spacing.

Planting stock is normally available as bulbs which must be broken apart by hand or machine into cloves before planting. Sometimes planting stock can be purchased already cracked and this option is recommended as it is a time consuming job. It must be pointed out that garlic should be cracked only a short time before planting as it has a tendency of heating and spoiling if held in a damp, poorly air circulated building.

Garlic cloves are best planted in the fall, late August to mid-September. With fall plantings, roots are established to enable early growth the following spring. In late October, just before freeze-up, the planted area must be covered with 3-5 inches of straw. The straw will insulate the crop from winter thaws which causes damage to cloves and roots. The straw must be removed in early spring (not burned off). If good snow cover can be guaranteed or the planted area is not in the chinook area of the province, straw cover may not be required. If spring planting is preferred, cloves must be planted before the end of April. It should be pointed out that garlic requires a long season and spring planting generally results in smaller bulbs.

Weed and Pest Control

Garlic is a shallow rooted crop in which deep cultivation for weed control should be avoided after the development of the root system. Root pruning resulting from deep cultivation will slow down growth and thereby reduce yields. Most chemical and weed control involves the application of a herbicide. Herbicidal oil at 40 to 60 gallons per acre applied before emergence of the garlic will do a good job of killing early weed growth, however, with fall planting the garlic is generally up and growing by late April well before there is much weed growth occurring. Totril at 30 fluid ounces per acre in 40 gallons of water is used as a post-emergence herbicide in garlic. Alternatively, Chloroprophaim (CIPC) at 4 pounds active ingredient per acre in 20 to 70 gallons of water applied immediately after spring planting may also be used. It should be noted that in order for this chemical to be effective in the weed seed zone, water from either sprinkler irrigation or rain must be required to activate the chemical. Poast at 0.4 gal/ac will control grassy weeds when applied postemergence. Use caution as Poast has no registration for use in garlic.

In Alberta, there is little difficulty encountered with insect pests except to mention that garlic should not be grown on land that has been seeded to onions the previous year due to possible onion maggot damage. Insecticides

should not be used with fall planting, but should be sidedressed in spring soon after crop emergence. Growers are encouraged to use Dasanit 15 G or Furadan 10 G at the time of planting. Caution should be taken when using Furadan as it has no registration for use on garlic in Alberta. Refer to the current issue of the Alberta Vegetable Guide for recommended rates.

Fusarium bulb rot is a common disease that can devastate a crop. Practice a good crop rotation that does not include onions. Drenching of cloves in Benlate (1 to 2 lb of 50 WP in 100 gallons water) just prior to planting is recommended or a furrow drench of Rovral at a rate of 4 lb/ac in 50-100 gallons water.

Yields Under Irrigation

Yields of 3 to 5 tons per acre can be expected. During the growing season it is important that the upper two feet of soil have continuous supply of moisture. Approximately 1 inch of water each week is required by the crop. Irrigation water should not be applied near harvest as thin wrappers and a shorter storage life result. Stop watering when leaves begin yellowing, about 2 weeks before harvest which can be late June in a fall planted crop. Water may be cut off after August 15 to enhance maturity if the crop is late. Maturity enhancement is possible by withholding water only if bulbs have separated into cloves.

Equipment

The availability of planting and harvesting equipment is the largest single limitation to commercial production of garlic. Planters are quite expensive and do an adequate job when properly adjusted. A set planter is available from Mr. Alex Sparenberg, R.R. 2, Grand Bend, Ontario N0M 1T0. Chemical insecticide applicator attachments will cost extra. This firm also builds a pickling onion harvester which will handle garlic. The machine is very compact and has been tested in Alberta. Some growers in Alberta have modified rototillers and single row potato diggers to aid in harvest and planting. Two to 3 acres planted by hand is practical where very little investment in equipment has been made.

Harvesting and Storage

Ideally, garlic is ready for harvesting when the tops begin to discolor. Yellowing will proceed from the bottom up as the top growth dies, falls over and turns brown. Harvesting should begin when one-third of the tops are dry and brown but still standing. If harvest is delayed, wrapper leaves will decay and the bulbs will shatter in the ground into separate cloves. In some years harvesting may have to proceed somewhat earlier considering adverse weather conditions such as frost which may occur in September.

After the removal of the bulbs from the field, the garlic should be cured at 80°F for 10 to 14 days at high air velocity and finally put into storage at 32 to 35°F and 60 to 70% relative humdity. It is very important that the temperature remain as constant as possible to prevent sprouting. When

considering construction of a storage building, the advice of a farm structures specialist should be sought. A less expensive alternative is field curing. Warm, dry weather is required and that may not always be available.

For market, the bulbs must be cleaned of dirty scales and sorted to size. larger bulbs command a higher price.

Markets

The annual consumption of fresh garlic in Alberta is approximately 100 tons. Assuming Alberta growers could supply garlic for an eight-month period and yields were 3 to 4 tons per acre we would require only about 20 acres to supply our domestic needs. Therefore, if there were many growers we would soon be in a state of over production. However, there is limited production at present and markets are readily available. Before making any financial commitments the potential garlic producer should get in contact with a produce wholesaler concerning the marketing aspects of the crop. Bear in mind that if you intend to sell garlic to the wholesale or retail trade, you must register with the Alberta Fresh Vegetable Marketing Board at 220E - 12 Street A, North, Lethbridge, Alberta T1H 2J1 (phone: 327-0447).