

Naked oil seed pumpkin



Naked oil seed pumpkin (*Cucurbita pepo* var. *styriaca*) is grown for its seed, which can be eaten or used as a source of oil. The seed is hull-less (hence naked) so it can be eaten without hulling. It is used for vegetable oil production, as a snack food, and in muesli mixes.

In China and the Americas the seeds of naked oil seed pumpkin are often eaten as a snack food, and in Hungary oil extracted from the seed is sold as a medicine to relieve prostate problems. The seed is high in unsaturated fats and protein as well as vitamins E and A. The seed also has potential as a sandwich spread, similar to peanut butter. Oil from the seed may be used for deep frying and as a base for mayonnaise, French dressing and margarine. The oil is dark due to carotenoids and chlorophyll and, when extracted in solvent, is high in the linoleic, oleic and palmitic fatty acids. At present, most naked oil seed pumpkin is imported into New Zealand; however, some local commercial plantings have been made.

Growing environment

The environmental requirements for naked oil seed pumpkin production are similar to other cucurbits such as buttercup squash. The pumpkin requires warm summer temperatures and a long, frost-free growing season as

there is little or no growth at temperatures lower than 15°C. A sheltered site is necessary to prevent the large-leaved seedlings from suffering wind damage. Research has shown that naked oil seed pumpkin can be grown in South Auckland, the Waikato, Hawke's Bay and the Bay of Plenty, although out-of-season frosts may make the crop marginal in the Waikato in some seasons. As a general rule, any area in which buttercup squash are produced commercially should be capable of supporting naked oil seed pumpkin.

Agronomy

Naked oil seed pumpkin can be grown on a wide variety of soils, but well-structured, free-draining silt and a soil pH of 6.0-6.5 is required. The amount of fertiliser and lime required will depend on the soil type, residual fertility levels and time of planting. Prior to sowing, the soil should be worked up to a fine tilth to assist germination, incorporate basal fertiliser and remove existing weeds. Field plantings can be established by either transplanting

seedlings or sowing seed. On a large scale, sowing seed directly into the field is preferable, but because the seed is not protected by a hull care is required to prevent seed damage. Crop & Food Research has shown that maximum seed yields can be expected from a plant population of 1-1.5 plants/m² rather than the 1.5-2.2 plants/m² recommended for buttercup squash. Heavy winds can cause plant losses if they occur before plants start to run so planting in sheltered areas is advisable. For high yields, weed control is essential. It can be achieved using a stale seedbed prior to planting, avoiding areas with problem perennial weeds, and using residual herbicides. No herbicides are registered for this crop in New Zealand, but herbicides such as Alachlor and Trifluralin, which are registered for use on squash, have been successfully used to control weeds in research plantings. Before the plants start to run, cultivation can also be used to control weeds.

Diseases, especially powdery mildew, can have a debilitating effect on crop yield. Spraying for disease control is, therefore, essential in most years. Disease prevention is very important as it helps maintain a leaf canopy, which protects fruit from the sun and prevents seed rot.

Irrigation is necessary especially in dry areas or in dry years, although excessive moisture late in the season can cause the fruit to rot prematurely. Pumpkins are harvested in autumn when fruit have started to change from green to orange. The average pumpkin weight at harvest is 6 kg, but they can weigh 15 kg or more. After harvesting, fruit are split and the seed extracted. On a small scale, extraction can be carried out by hand, but this process is tedious and expensive. On a large scale, mechanical extraction methods would be required. The seed is then cured in preparation for further processing or marketing.

Production in New Zealand

Seed yields of between 1.0 and 1.4 t/ha have been obtained in field trials in South Auckland, Waikato and in

Hawke's Bay. These figures compare favourably with yields of 0.5-1.4 t/ha reported for seed pumpkins grown overseas. The oil content is in the range 38 to 49% of dried seed, which is similar to overseas levels. Ninety percent of the oil is made up of linoleic (18:2), oleic (18:1) and palmitic (16:0) fatty acids with the largest percentage (50%) in the linoleic fraction. The other 10% of the oil is made up of small amounts of the other fatty acids. Seed has a strong nutty flavour and the variety we are growing gives a much larger seed than pumpkin seed currently retailed in New Zealand. Pumpkin flesh, which has a possible total yield approaching 100 t/ha, may also be useful.

The dehydrated flesh has been tested for use in processed foods, but was found to be too gritty for many end users. It may be useful as a stock food, but this use has not yet been evaluated.

Conclusions

Crop & Food Research has shown that naked oil seed pumpkin production in New Zealand is possible with yields and seed quality similar to that of overseas producers. Although research plantings have only been carried out in some areas of New Zealand, production should be possible wherever there is commercial production of other cucurbits such as buttercup squash. Whether or not seed production is economically viable has not yet been determined but New Zealand-grown seed could readily be substituted for the imported product. Further establishment of this crop is likely to be limited until a commercial outlet is established to sell seed or oil. Efforts are underway to identify an appropriate agency. There may also be some potential to export the oil for use in culinary preparations or for medicinal purposes. In addition to commercial possibilities, naked oil seed pumpkin would be well worth growing in the home garden.

Further reading

Loy, J. B. 1990: Hull-less seeded pumpkins. A new edible snack food crop. *In: Advances in new crops.* Janick and Simon *ed.* Timber Press, Portland. Pp. 403-407.

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