Myoga Ginger Production in New Zealand

J. M. Follett
New Zealand Institute for Crop and Food Research, Ruakura Agricultural Centre, Private Bag 3123, Hamilton

INTRODUCTION

Myoga (*Zingiber mioga* Roscoe) is a member of the ginger family and a native of Japan. It is grown commercially for the spring shoots and subterranean flower buds it produces in autumn. Myoga flower buds (often called hanamyoga) are used in soups, tempera, pickled, and as a spice with tofu or bean curd. The young shoots are used mainly for making soups (Follett, 1986). Production is strongly seasonal and as a result high quality shoots and flower buds supplied out of season can fetch high prices on the Japanese markets. In order to take advantage of these high prices, a number of New Zealand growers are in the early stages of myoga production. Their first commercial crop of flower buds will be available for export in late Summer and early Autumn 1995. Currently there is little interest in the production of myoga shoots for export.

PRODUCTION CYCLE

Although not botanically related, myoga has a similar production cycle to asparagus. Both crops overwinter as underground rhizomes with spears emerging in early September (spring in New Zealand) when soil temperatures start to rise. The shoots continue to grow during the spring until the foliage is 1.0 to 1.5 m tall. In midsummer, subterranean flower buds start to form. In the Waikato, the buds are ready for harvest in late February If allowed to develop, the buds appear at ground level, producing an attractive carpet of pale yellow petals in early autumn. After flowering, the foliage senesces and is killed by winter frosts.

SOIL

Myoga prefers a well-drained, friable soil. Soil prone to water-logging will reduce myoga production and increase the incidence of root disease (Douglas and Follett, 1992). The free-draining, silt loam soils of the Waikato region, derived from volcanic ash, have proved ideal.

CLIMATE

Myoga prefers an equitable climate with warm summers and cool winters. Excessive wind can cause lodging of the foliage in late summer which can hamper harvesting, while insufficient soil moisture during bud formation can reduce bud size. The winter must be cool enough to ensure that the plant goes into winter dormancy. Without a winter dormancy period, flower initiation appears to be erratic and random. Myoga would probably grow over most of New Zealand, however, the far north may have insufficient winter chilling for commercial production, and in colder areas out of season frosts could decimate leaf growth. Most commercial development is taking place in South Auckland, the Bay of Plenty, and the Waikato. Myoga has also been successfully grown in Canterbury in the South Island.

SHADE

In New Zealand, myoga will not grow without shade. If grown in full sun, the leaves become chlorotic, then bleached, before finally dying. Fifty percent shade is generally recommended for good growth (Douglas and Follett, 1992).

PROPAGATION

Myoga can be propagated by root cuttings or tissue culture. Root-cutting production has to date been the only means of commercial propagation in New Zealand. Rhizomes are lifted in winter, washed and divided into 20 cm lengths, with each length containing at least two nodes. The root cuttings are then dipped in a fungicide and cool-stored at approximately 4C for a minimum of 6 weeks (Follett, 1991). At no stage should the cuttings be allowed to dry out, with exposure to the sun at any time likely to affect plant survivals.

PLANTING

Planting should be carried out in early spring, directly from cool storage, or from established beds. In wet seasons or with irrigation, plantings as late as December have been successful. Cuttings are lined out at the base of 10- to 15-cm deep trenches or furrows. Alternatively, for small areas, cuttings can be individually planted with a spade. Myoga can be planted in beds or rows. As the plant spreads radially, it soon grows into vacant areas. At Ruakura, we have recommended that plants be spaced 40 cm apart in rows 1.5 m apart to allow for this expansion. By the second season the rows are continuous while still allowing pickers access between rows.

PESTS AND DISEASES

Compared to many horticultural crops, myoga has to date appeared relatively pest and disease free. Rhizoctonia rot on flower buds has proved to be a minor problem, while greasy cutworm can damage young shoots emerging in the spring. Wet ground rots have also been a problem when the myoga has been grown in poorly drained soils. By far the most debilitating problem in terms of reducing yields has been cucumber mosaic virus. This ubiquitous virus is spread by aphids from weeds in waste areas. Infected plants must be destroyed, with crop hygiene being the main control method.

WEED CONTROL

Myoga is a vigorous crop and once established has few major weed problems. All perennial weeds, particularly rhizomatous grasses and broadleaf weeds, should be controlled before the crop is established. This can be followed after planting, with a pre-emergent herbicide to control annual weeds. Once the crop is established, a winter clean-up (desiccant) spray followed by a pre-emergent herbicide and mulching required for the production of high quality flower buds will control most weeds.

CROP MANAGEMENT

Mulching. Mulching is an essential part of crop management, as it keeps the developing flower buds clean and prevents the buds turning green. It also helps reduce weeds and conserve soil moisture. In Japan, rice husk straw is commonly

used, but New Zealand growers have used sawdust and wood shavings. Research at Ruakura comparing barley straw and sawdust found significant yield increases from using sawdust. Indications from this research also suggested that a 20-cm compared to a 10-cm deep mulch is preferred. The mulch is applied in the winter when the crop is dormant.

Fertiliser. There is little indication that myoga requires high rates of fertiliser, although few trials have been carried out in New Zealand. Conversely, anecdotal evidence indicates that excessive nitrogen promotes foliage growth at the expense of flower production. Research at Ruakura, evaluating phosphate fertiliser rates, found no differences in flower production. Current recommendations are that unless there is a known soil nutrient deficiency, fertiliser rates should be conservative, especially with regard to nitrogen.

Vigour Control. In northern New Zealand, the growth of myoga is vigorous. The plant expands radially with most flower production occurring where the plant is expanding. If left untended, plants quickly grow into one another, reducing the ease of access for harvesting.

Controlling this vigour is seen as a major problem for the New Zealand industry. Possibilities include both mechanical and chemical thinning.

Harvesting. In the Waikato, myoga flower buds can be first detected in late January and early February. The buds continue to increase in size until the end of February. From about early March on, the mature buds start to produce petals and become unmarketable. Harvesting is carried out by fossicking through the mulch until harvestable buds are found. They are then plucked by snapping the stem. Research has shown that buds with a minimum diameter of 15 mm will have reached a marketable size of at least 6 g.

Research indicates that yields of between 6.0 to 13.0 t/ha are possible, depending on the age of the plant material and management practices.

MARKETING

Horticultural Export Authority (HEA). A Myoga Product Group, under the auspices of the HEA, has been established. This product group, controlled by growers, has been established under New Zealand law to control and regulate the efficient export of the crop. Funding for the group is achieved by levies imposed on growers. Growers are required to be registered to grow this crop for export.

Grade Standards. Among the responsibilities of the Myoga Product Group is the establishment of grade standards. Currently a myoga flower bud suitable for export must be larger than 6 g and be mostly rouge in colour with no more than 20% of the bud green. The stem should be no more than 10 mm long and inflorescence or petals must not be present. The buds must also be clean, fresh, turgid, free of disease, and capable of attaining a phytosanitary certificate.

Transport. Although myoga flower buds have a reasonable shelf life, common sense management precautions should be taken. Field heat should be removed from the buds as soon after harvesting as possible, with cool storage at all stages from farm gate to market. Currently the only transport option from New Zealand to Japan is airfreight.

CONCLUSIONS

Myoga flower bud production is a very new industry to New Zealand, established to provide product during the Japanese off-season. It is seen as a small niche market that could easily be destroyed through oversupply. The Myoga Product Group regulates the production and supply of myoga to the market. At present, it is not known how large the market is for off-season production.

Myoga production in Japan is an old industry carried out on small family plots. In New Zealand the industry tends to be on a larger scale, with many of the traditional production techniques being unsuitable in the New Zealand context. Research by both growers and Crop & Food Research is ongoing.

It is an exciting beginning, with trial plantings establishing and growing well, but the long-term viability of the industry will depend on the market, and the ability of New Zealand growers to adapt Japanese small-scale farming techniques to their own circumstances.

LITERATURE CITED

Douglas J. A. and **J.M. Follett.** 1992. Myoga ginger—A new crop for New Zealand. Proc. Agron. Soc. NZ. 22:71-74.

Follett, J. M. 1986. Production of four traditional Japanese vegetables in Japan. Ruakura Agricultural Centre. Special Publication ISBN 0-477-03082-3.

Follett, J. M. 1991. Propagation notes for new and novel crops introduced into New Zealand. Comb. Proc. Intl. Plant Prop. Soc. 41:104-109.

ACKNOWLEDGMENTS

I would like to thank J. A. Douglas for his critical review of this paper.

Closed, Plant-Production System—Update

Bruce Briggs
Briggs Nursery, Inc. 4407 Henderson Blvd. Olympia, Washington 98501, U S A

James L. Green
Horticulture Department, Oregon State University, Corvallis, Oregon 97331-7304, U S A

Since initiation of the research in 1990, diverse plants from 42 families (68 genera, 72 species) have been grown in the closed, insulated pallet system (CIPS). Greater growth has occurred in various embodiments of the plant-driven CIPS than in the open container system (OCS) control. Branching of roots, and of shoots of some plants, is greater in CIPS. *Phytophthora cinnamomi,* a plant root pathogen, does not spread from inoculated to noninoculated root pouches in CIPS. In the greenhouse, tomato plants are more tolerant of saline irrigation water, and production is more profitable in CIPS than in the OCS.

INTRODUCTION

The closed, insulated pallet system (CIPS) is a low-maintenance, resource-conservative production system. Description of the CIPS, methods of plant production in