HORTICULTURE NOTE NO. 13:

CELERY

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Celery is a plant of the carrot family. The thick fleshy leaf stalks are used raw in salads, or cooked as a vegetable or in soups or stews. Currently the market for fresh celery in PNG is estimated at 2 tons per week, mostly in Port Moresby and Lae. Production of quality celery requires good management. An adequate supply of water and nutrients must be available.

CLIMATIC REQUIREMENTS

Celery prefers a cool climate with maximum temperature not exceeding 21°C. Evenly distributed rainfall is required, otherwise irrigation will be necessary. Excessive rainfall favours development of leaf diseases. Exposure of young plants to low temperatures (4 to 13°C) may cause plants to bolt (produce flower stalks). In PNG bolting may follow a spell of cold nights with near zero temperatures. At very high altitudes (above 2600m) there is a risk of frost damage.

SOILS

Soils must be well drained with good water holding capacity. They should be well supplied with organic matter and plant nutrients. Peaty soils can be successfully used for celery production.

The pH should be in the range of 5.5 to 6.7. Many highland soils are significantly more acid than this and lime may be required.

Most highland soils are deficient in boron. Celery is a crop with a high boron requirement. This deficiency must be corrected if celery production is to be successful.

PRODUCTION AREAS

Celery production in PNG is best at high altitudes (1700-2600m). Good quality celery has been produced in Tambul (WHP) and Gembogl (Simbu). Areas with similar climate and rainfall should prove suitable.

VARIETIES

Available varieties include:

Utah No. 52-70 R Improved	(Yates NZ)
Tendercrisp	(Hendersons)
American Stringless	(Coopers)
Dewcrisp Green	(Yates NZ)

These varieties should perform satisfactorily in PNG conditions. However trials need to be done before a firm recommendation can be made.

PRODUCTION METHOD

Celery is grown as a transplanted crop. Seedlings are raised in boxes and transplanted 9-10 weeks after sowing.

Seedling Production

1. Seedlings are best produced in boxes in a nursery under clear plastic roofing. However field seedbeds can also be used. Nursery production is described below.

2. Sterilize the soil to be used for sowing - cooking in a 200 litre drum.

3. Mix 20g (1 matchbox) 12:12:17/triphos mixture (1 part 12:12:17 to 1 part triple superphosphate) into the soil for each seedling tray (35 x 35 x 5 cm).

4. Plant 2 seeds in each hole 1 cm deep. Thin out to 1 plant 3 weeks after germination.

5. Use a 10 x 10 arrangement for sowing each tray so that 1 tray contains 100 seedlings.

6. Spray with Bravo and foliar fertilizer at weekly intervals, starting 2 weeks after emergence. Rates are 2 ml Bravo Flowable and 2.5 ml Yates Indoor Plant Food per litre of water.

7. At 6-7 weeks after sowing spray seedlings with Solubor at the rate of 20g Solubor to 10 litres water. Add a wetting agent. Do not mix with other chemicals.

8. Seedlings should be removed from the nursery 8 weeks after sowing for hardening off and stood outside. Transplant the following week.

9. Seedlings are ready to transplant when they are 10 to 15 cm tall and have developed sturdy roots and stems.

Land Preparation

A raised bed 1.2 metres wide should be prepared. If the pH is below 5.5 lime should be added (500g (1 large fish tin) ground limestone per square metre). Lime should be worked in at least 2 weeks before planting. The soil should be broken down to a good tilth and raked level before transplanting.

A balanced NPK fertilizer should be applied before planting. Mix together 2 parts 12:12:17 to 1 part triple superphosphate and apply 1200kg/ha (1 large fish tin per 4m²) of this mixture.

Transplanting

Plant 3 rows per bed (45 cm between rows). Plants can be spaced 30 cm apart in the row. Closer spacing will promote self-blanching but heads will be smaller. Transplant into moist soil and water in if rain does not fall.

Topdressing

Apply 100kg/ha urea at 3 weeks and 6 weeks after transplanting (1 large fish tin per 30 metre length of bed).

Weeding

The crop should be kept clean and free of weeds. On small areas hand weeding should be adequate.

Blanching

Quality of celery can be improved by blanching. Blanching means the production of white leaf stalks by exclusion of light from the lower part of the celery plant. Individual plants can be blanched be wrapping with cardboard sleeves. Alternatively a low fence (40 cm high) of 'pitpit banis' can be erected on either side of the bed to keep light out from the side of the bed. Blanching should be started about two weeks before harvest. It is a good idea to apply a fungicide spray for control of leaf spot just before blanching is started.

PESTS, DISEASES AND DISORDERS

Septoria leaf spot (*Septoria apiicola*)

This is a major disease of celery and is favoured by cool damp weather. On leaves and leaf stalks small yellowish spots are formed, which turn brown and then black. The older leaves are infected first, but the disease then spreads to young leaves.

Control:

Seedbed: Spray Bravo (chlorothalonil) weekly (see Seedling Production)
Field: Continue weekly Bravo sprays (20 ml/10 litres water) or spray Copper oxychloride (50g/10 litres water) weekly.

Bravo is preferred where conditions are very favourable for the disease. DO NOT HARVEST FOR 3 DAYS AFTER SPRAYING. Crop rotation will reduce disease carry-over from old crops.

Cracked Stem (Boron deficiency)

Transverse cracks appear on the outer surface of the leaf stalks. The damaged area later turns brown. Boron deficiency promotes development of axillary shoots, twisting of young leaves, browning of leaf margins and, sometimes, death of the growing point.

Control:

Boron should be applied as Soluble spray to the seedlings (see above - Seedling Production). In severe cases a second spray should be given about 2-3 weeks after transplanting.

Aphids

Small green sucking insects found on the leaves. Aphids cause distortion of the leaves and may transmit virus diseases.

Control:

Spray with acephate (Orthene 75 WP) 10g/10 litres water.

Nematodes

Root-knot nematode (*Meloidogyne* sp) causes galls and swellings on plant roots and results in stunting of the plants. More likely to be a problem at lower altitudes.

Another nematode (*Helicotylenchus* sp) was recently identified attacking celery at Kabiufa (near Goroka).

Control:

It is best to practise crop rotation and avoid infested soils. Chemical control is expensive and involves use of dangerous chemicals.

HARVESTING AND MARKETING

Celery should be ready for harvest about 10 weeks after transplanting. At this stage leaf stalks should be about 50-60 cm long and the cut and trimmed heads should weigh about 0.8-1.0kg each. It is best to harvest early in the morning when temperatures are cool. The celery is cut just below soil level and small and tough outer leaves removed. Leaves are cut off about 55 cm above the base of the plant. The celery is washed to remove soil and packed in boxes. If the celery is to be kept for some time before sellling, it should be transferred to a cool-store as soon as possible.

Celery should not be allowed to become too old. Otherwise the outer leaf stalks can become pithy and lose their crisp quality.

For further information on post-harvest handling see:
Post-harvest handling of Fruit and Vegetables in Papua New Guinea, FPDC, August 1990 (Available from FPDC, P.O. Box 1290 Mt. Hagen).

YIELDS

A yield of 4-5kg per square metre should be attainable with good management. At 60 toea/kg (Hagen Vegetable Depot) this represents a gross return of K2.40 to K3.00 per square metre.