
PROJECT: **Bitter Melon (*Momordica charantia*) Selection Trial**

Project Officers: **K. Blackburn and M. Traynor**

Location: CPHRF

Objective:

To assess the suitability of a range of hybrid and open pollinated bitter melon cultivars in an observation trial for performance under local conditions.

The Asian vegetable growers select their own bitter melon seed from open pollinated (OP) plants usually from the first fruit produced from the young plants. The selection criteria is generally on fruit size with fruit shape a secondary consideration. The rationale is to have a large fruit that will give them more flexibility at harvest or being able to achieve a suitable fruit size before the fruit matures and ripens. The original OP seed line is possibly a mixture of types that have been introduced over the years. Some of the bitter melon growers have been selecting seed for seven to 10 years and are prepared to reject up to 30% of their fruit for small size, over-maturity, and off-types as normal practice. The DPIF officers working on the project have always considered the local selection to lack fruit size and uniformity and the plants to lack vigour and yield potential.

Materials and Methods:

Fourteen varieties were sourced from interstate and overseas (Table 1). These were planted in an RCBD trial with two replications, with four plants in each replicate. Spacing was 1 m between plants, with 3 m between plots and rows. The plants were trained to grow up a vertical string and lateral branches were pruned off except where three horizontal wires were used to hold the lateral branches for fruit production. The plants were pinched off when they reached the third or top wire.

Specific nutrition programs were developed for the bitter melon trial. Nutrients were injected into the irrigation system.

25N : 5P : 18K kg/ha/week was used for early growth

12N : 5P : 18K : 5Ca kg/ha/week was used after fruit set or about six weeks onwards

Lime and basal fertiliser were applied and the necessary trace elements were injected during early crop growth. The trial irrigation was carefully monitored with soil moisture tensiometers and the trial plants developed vigorously and healthy.

Results:

Table 1 summarises the measurements taken on the average of 12 fruit during the five weeks of harvest. Yield records were not collected due to a shortage of resources in managing the trial. It was considered that the selection of types suited to market requirements was more important at this stage of investigation.

Table 1. Fruit measurements from bitter melon variety trial. Each measurement is the average of 12 fruit

Variety	Length (cm)	Width (cm)	Weight (g)	Flesh Thickness (mm)	Brix (mid fruit)
1. Baizin Green (hyb.)	23.5	6.0	360	9	2.8
2. Kiew Yoke 59 (hyb.)	32.0	5.0	380	7	3.5
3. Kiew Yoke 68 (hyb.)	28.0	5.5	365	8	3.0
4. Bitter Spindel (hyb.)	14.5	5.0	110	7	3.3
5. Polo (hyb.)	23.5	5.0	245	8	2.8
6. Known You Green (hyb.)	26.0	6.0	318	9	2.7
7. Verdure (hyb.)	17.5	7.0	311	10	2.8
8. Moon Rise (hyb.)	28.0	5.5	332	8	2.8
9. Moon Light (hyb.)	21.5	6.0	306	8	3.1
10. 'Long Type' (OP)	22.0	6.0	308	8	2.7
11. 'One End Large' (OP)	17.0	6.0	247	8	2.8
12. 'Big Dooms' (OP)	15.0	7.0	276	9	3.2
13. Vong 3 (OP)	24.0	7.0	395	10	2.9
14. Moon Beauty (hyb.)	20.5	7.0	367	9	2.9

Generally, most of the hybrids were uniform over the five week harvest period which could have been extended further. Hybrid Baizin Green was a particularly good type with good uniformity of shape and size while the three OP's 10, 11 and 12 were quite variable. The OP, Vong 3 is a particularly good type and similar to the local selection (a rough bumpy type). The first fruits were harvested some 10 weeks after transplanting.

Table 2 summarises the appearance of the fruit which is critical for market acceptance. Detailed field assessments on the plots showed varieties 2 and 3 had poor plant vigour, were sparse plants produced long thin fruit, and had poor leaf cover. Variety 4, Hybrid Bitter Spindel had very vigorous plants but was a very poor performer with small fruit size. The cultivars with most potential were the hybrids Baizin Green, Polo, Known You Green and Moon Light and the open pollinated line Vong 3. It is worth noting that the hybrids Baizin Green and Known You Green are very similar in appearance and performance.

Six relatively experienced growers, with five to six years experience in growing bitter melon, were invited to visit the trial site, closely inspect the cultivars and then make comments on the suitability of the lines for their markets. All the growers said that OP Vong 3 was a good type (rough irregular lumps). However, this line was developed by Dr Vong Nguyen and is not available commercially. One grower considered Variety 9, Moon Light to be a good smooth type, very shiny and bright with a good shape.

Table 2. Bitter melon appearance

Variety	Shape	Bumps	Skin Brightness	Skin Colour (Light/Mid/Dark)
1. Baizin Green (hyb.)	Good uniform even shape	Large smooth uniform ridges	Fair	Light/Mid
2. Kiew Yoke 59 (hyb.)	Fairly uniform, some bent. Long & thin	Uniform, medium size, smooth ridges	Fair	Light/Mid
3. Kiew Yoke 68 (hyb.)	Fairly uniform, some bent. Tapered.	Medium size, fairly smooth ridges	Poor/fair	Light
4. Bitter Spindel (hyb.)	Uniform small even shapes. Too small	Small, irregular, rough bumps	Poor	Light/mid/dark
5. Polo (hyb.)	Mostly uniform, some bulges	Mostly large, irregular smooth bumps	Good	Mid
6. Known You Green (hyb.)	Good uniform even shapes	Medium size, smooth uniform ridges	Fair	Mid
7. Verdure (hyb.)	Uniform short blocky shape. Tapered	Medium size, fairly smooth uniform bumps	Fair	Mid/Dark
8. Moon Rise (hyb.)	Fairly uniform, some bent. Long & thin	Fairly uniform, smooth bumps. Some ridges	Fair	Mid
9. Moon Light (hyb.)	Mostly uniform even shapes	Small/medium, irregular, smooth bumps	Very good	Mid/Dark
10. 'Long Type' (OP)	Variable. Some pointed, some blunt	Irregular. Some large ridges, some rough	Poor	Light/Mid
11. 'One End Large' (OP)	Very variable. Short and long shapes	Irregular medium bumps, mostly smooth	Fair/good	Dark
12. 'Big Dooms' (OP)	Variable short block or top shapes	Fairly smooth irregular bumps	Fair	Mid/Dark
13. Vong 3 (OP)	Mostly uniform, some bulges, some pointed	Small/medium irregular rough bumps	Fair	Mid
14. Moon Beauty (hyb.)	Fairly uniform. Some block shapes	Very irregular, small/large smooth bumps	Good	Cream/white