

# **A NEW HYBRID CHANGKOK MANIS VARIETY FOR SARAWAK - "WRINKIE'**

By

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## **Introduction**

The sweet shoots, Changkok manis, is a well known leafy and shoot vegetable in Sarawak. It is also called Cekur manis in Peninsular Malaysia. Botanically identified as *Sauropus androgynus*, it belongs to the *Phyllanthaceae* (previously *Euphorbiaceae*) family. As a vegetable, it is very nutritious and is relatively easy to grow. However, despite its economic, medicinal and nutritional values, it has been somewhat neglected. Of late, this crop has been wiped out in some farms where the plants were infected by a fatal disease known as bacterial stem blight disease (BSBD). It is caused by *Xanthomonas campestris* bacteria. Effective chemical control is not currently available.

In order to overcome this production constraint, Agriculture Research Centre (ARC), Semongok, has initiated a programme to breed for a resistant variety and subsequently, released a new first filial generation hybrid (F1) variety known as 'Wrinkie'. This hybrid is resistant to BSBD and has good eating quality shoots. The variety is especially useful in areas where the disease has prevailed.

## **Symptoms of Bacterial Stem Blight Disease**

Diseased plants have characteristic yellow stem streaks and chlorotic leaves (Photos 1 & 2). The symptoms are seen on the upper portion of the stem and then slowly proceed towards the lower part when the plant would die. Any one or all the stems may be infected. For some clones, pruning may revive the plants. For others, the whole plant would be gone, depending on their tolerance levels to the disease. The disease tends to attack older gardens.



Chlorotic symptoms of BSBD infected plants



Empty row left from BSBD infections

### **Characters of Changkok manis 'Wrinkie' Hybrid Clone**

'Wrinkie' is a slender and tapering plant with strong dark green foliage. It is uniform, upright and non-branching, unless pruned. The shoot bears many intense dark green leaves which are wrinkled or crinkled, uneven and have shallow depressions. The leaf/shoot ratio is about 47.9 by weight, but the shoot looked 'bulky'. Single leaf weight is  $0.12 \pm 0.05$  g, usually 4.5 cm long by 2.2 cm wide and is about 0.02 mm thick. The leaves are crispy, easily crushed by hands especially when freshly harvested. High proportion of the shoot may be consumed as all the leaves may be prepared for cooking after hand crushing and twisting.



'Wrinkie' Changkok manis shoots

### **Quality of Changkok manis 'Wrinkie'**

This hybrid clone has good quality shoots and high shoot yield. The nutrient contents of this clone as analysed at ARC are 76% moisture, 8.0% protein, 6.5% carbohydrates, 5.8% fats, 0.17% phosphorus, 0.74% potassium, 0.17% calcium, 0.07% sulphur, 0.10% magnesium, 26ppm iron, 11ppm manganese, 2ppm copper, 14ppm zinc and 7ppm boron.

The 'Wrinkie' is of medium sweetness and has acceptable eating quality. The shoot has a sweetness Brix reading of 9.0. The wrinkled or crinkled leaves are crispy and easy to crush for cooking preparation. It is very suited for 'Lui cha" due to its strong dark green colour and good green colour retention.

The crinkled appearance of the 'Wrinkie' shoots may 'scare' some new buyers who might think that the shoots are 'diseased' like those infested with insects or infected with viral disease. It is a matter of getting use to its look.



Close up at 'Wrinkle' - notice the crinkled dark green leaves

### **Supply of Changkok manis 'Wrinkle' Planting Material**

'Wrinkle' clone is easily propagated by stem cuttings. At present, cuttings are available from ARC, Tarat and Kebuloh stations. The shoots sold in the markets, if confirmed to be 'Wrinkle', could also be used for planting.

### **Growing Changkok manis 'Wrinkle'**

When growing 'Wrinkle', one should follow as close as possible, the Good Agriculture Practice (GAP) and other quality assurance practices. This is to ensure that the vegetable is pleasing to the eyes, as well as safe and wholesome to consume. The 'Wrinkle' may be grown just like any other Changkok manis clones or varieties. By comparison, this hybrid may start slightly slower after field planting of stem cuttings. The sprouting from established plant after harvest is faster by a few days than traditional clones.

'Wrinkle' may be harvested 3–4 months onwards after direct planting of the stem cuttings in the field. These plants are strongly resistant to the bacterial disease. The clone could be planted for new ventures or for the rehabilitation of previously disease infected land.

### **Yield**

Sweet shoot is a heavy foliage yielder and is capable of giving many rounds of harvest if the plants are kept in good conditions. The 'Wrinkle' hybrid variety at ARC has recorded shoot yield of 12–28 mt/ha/year. Higher yield is expected with good soil and good management with adequate nutrients and watering. An annual yield of 60 mt/ha may be

obtained from well managed farm on good soils, as in the case of a farm at Beratok (Photo 3).

### **Costs and Returns**

The cost for land preparation, planting, agrochemical, irrigation, manure and wages is estimated to be RM 15,000 for the initial year. If the harvest is 20 mt/ha/year and the produce is sold at 1.00/kg, the estimated annual return is around RM5,000 per ha. Better returns in subsequent years are expected as capital costs would have been recovered by then.



Vigorous Wrinkie plants in a farmer's field