

## *Stevia rebaudiana* Bertoni (Bertoni)

Synonym: *Eupatorium rebaudianum* Bertoni

Family: Compositae

Ayurvedic Name: Madhupatra

Hindi Name: Meeti patti

Trade Name: Stevia

Habit: Herb

Part Used: Leaves

Active Ingredient: Stevioside,  $\beta$ -carotene,  $\beta$ -Sitosterol, Stigmasterol, Volatile oil, Rebaudioside, Riboflavin



**Biological activity:** Alkaline, Anorectic, Antiaging, antibacterial, antidandruff, antidiabetic, Antifungal, Antihypertensive, Antiinflammatory, antiviral, detoxicant, Diuretic, Hypoglycemic, Stimulant etc.

**Traditional and Therapeutic use:** The plant has been used for more than 1,500 years by the Guaraní peoples of South America, who called it ka'a he'ê ("sweet herb"). The leaves have been used traditionally for hundreds of years in both Brazil and Paraguay to sweeten local teas and medicines, and as a "sweet treat".

**Morphological and floral characteristics:** Reaches a height of 0.5m up to 1m. Flower heads are small (~15mm). Herbaceous growth no woody stem. Alternate leaf arrangement. Subsequent leaf primordial arise oriented 90 degrees from the previous. Leaf size varies based on environment/conditions for growth, though fairly small.

**Distribution:** At present, the plant is commercially cultivated in various countries including Paraguay, Argentina, Germany, China, UK, Japan, Spain, South Korea, Canada, Australia, Mexico, Belgium, United States, Brazil, Israel, Malaysia, Indonesia, Taiwan, Thailand, Tanzania and India.

**Climate and Soil:** It requires very good drainage, any soils that retain the moisture for very long period of time are unsuitable for its cultivation. Similarly black cotton soils with very heavy clay content should also be avoided. The plant prefers a lightly textured and well-drained soil to which organic matter has been added. Red soil and sandy loam with a pH of 6 to 7 are best for the cultivation of Stevia.

### **Main field plantation**

**Land preparation:** The land sites are plowed twice to prepare a fairly smooth and firm-planting surface. Around 50 MT of FYM/ha has to be applied as a basal dressing during the last ploughing to incorporate the manure with the soil. With proper drainage and irrigation channels the field needs to be divided into plots of convenient size for effective management.

***Transplanting and optimum spacing:*** Stevia seedlings are planted on the middle of raised bed having 15 cm height. The space between ridges should vary between 40 and 60 cm and a spacing of 20-25 cm should be maintained between plants. This would give a plant population between 70,000 and 100,000 per hectare. Depending on climatic conditions, stevia is cultivable throughout the year except for times when it is extremely hot (more than 43 °C) or cold (lower than 6 °C). Planting time of stevia should be done on the commencement of main rainy season. It is also possible to plant in any time in areas where irrigation is available.

***Fertilizers:*** Under average soil condition, application of FYM at a rate of 50 t ha<sup>-1</sup> and fertilizers N-60 kg, P<sub>2</sub>O<sub>5</sub> 30 kg and K<sub>2</sub>O 45 kg ha<sup>-1</sup> is recommended.

***Weed control:*** The crop requires hoeing and weeding for the control of weeds. Removal of weeds should be done manually. First weeding and hoeing should be done 15 days of transplanting and subsequent weeding and hoeing will be done one month after the first weeding and hoeing.

***Irrigation:*** Normally, the plant requires frequent, shallow irrigation. Under the conditions of limited rain fall, irrigation is required at least once in a week when the tip leaves starts to droop. The plant cannot tolerate drought. Watering frequency should be scheduled so that the plants do not wilt for want of water.

***Diseases and pest control:*** Cutworms and Septoria are the most common pests of Stevia that are reported to cause considerable yield loss. For managing the problem, it is advisable not to irrigate the field frequently and proper ridges in such a way not to create favorable condition for septoria growth and development.

***Crop maturity and harvesting:*** The first harvest of the crop can be done in four months after planting and subsequent harvest once every 3 months. Some times 40 to 60 days after harvest are sufficient for subsequent harvests. Optimum yield and stevioside quality and quantity is best obtained just at the time of flower bud initiation. As days to harvest vary from place to place, it is nice to harvest plants at the time of 50% flower bud initiation. The easiest harvesting technique is to cut the branches 5 cm above the ground level with pruning shears before stripping the leaves. The tips of the stems can be clipped off and added to harvest yield, as they contain as much stevioside as do the leaves. On an average three commercial harvests can be obtained per year.

***Post-harvest management:*** Immediately after harvest the herb is dried. The freshly harvested plants can be dried in shade. It can also be dried using simple drying racks inside transparent poly house or transparent glass roofing or by passing dry air just above room temperature. Depending on weather conditions and density of loading, it generally takes 24 to 48 hours to dry stevia. Longer drying time will lower the stevioside content of the final product. In any of the drying conditions, the moisture content of the dried powder should be maintained not more than 12%. After adequate drying, the leaves are stripped of the stems/twigs and packed and stored in cool, dry place.

***Yield:*** A dry leaf yield is 5000 – 6000 kg per hectare per year.