INTERCULTURE AND WEED MANAGEMENT

As soon as the plants have established into the ground, cultivation and weeding should be employed whenever deemed necessary. Chayote are compact at the ground level only taking up a few feet, but they require a radius of 2 m around each hill be kept weed free to provide ample space for the crops' growth and development. Once the crop has spread and covered the trellis, weed growth will be suppressed. The rooting area should be mulched constantly to retain water and release more nutrients. Never cultivate the rooting area because the roots are very shallow. Weeding is done as and when necessary. At the initiation of vine growth stake the plants for proper growth.

HARVESTING, YIELD AND STORAGE

The fruits are harvested manually once they reach the desired size. The vines flower in 3-5 months and the fruits are ready for harvest 28-32 days after pollination. Under commercial conditions the fruit is picked two or three times weekly when slightly immature, just before the seed protrudes from the apex. The fruit will grow larger if left on the vine, but its flesh will become fibrous. Yields in the first year are typically 30-40 fruits; second year can be up to 80-100 fruits; and third year even more. Yields depend on the bright sunshine hours (BSSH), soil fertility, root competition and trellising methods and size. About 2.5-3.5 tonnes/ha can be obtained. Yields often decline after the third year. Chayote have a short shelf life and will begin to sprout in 4-6 weeks, hence, to preserve them for few weeks longer, it can be kept in small open plastic bag. Fruits must be harvested and handled carefully to prevent cuts, bruises, and spread of diseases. Chayote can be stored for 4-6 weeks at 4-5 °C and RH 85-90 per cent. Sprouting is promoted at > 25°C temperature.

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ORGANIC CHAYOTE PRODUCTION TECHNOLOGY

Under Tribal Sub Plan

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INTRODUCTION

Chayote (*Sechium edule* (Jacq.) Sw.), oftentimes called the poor man's vegetable is very popular in North Eastern hilly region and grows abundantly without much care and attention from mid to high hills of Sikkim. Chayote fruit is good source of fiber, vitamin C contents, potassium, calcium and iron. All plant parts of chayote are edible *i.e.*, fruit, flowers, seeds, tendrils, young leaves, shoots and root. All plant parts are also good feed for livestock. 'Field Gene Bank' of 86 chayote accessions has been established and maintained at Research Farm, ICAR Sikkim Centre. Collected chayote accessions showed morphologically different types and colours of fruits *viz.*, round, oblong, spiny, very spiny, without spine and creamy white to green, dark green fruits.

CLIMATE

Chayote can be grown successfully from 300-2000 m amsl and requires high relative humidity (80-85 per cent) with well distributed 1500-2000 mm rainfall. The most suitable average temperature is 15-25°C for vegetative and fruit growth of chayote. Temperatures < 15°C damage small or unripe fruits while > 28°C favour excessive growth, flower and unripe fruit drop, which ultimately reduces overall production. Fruit production is highest when night temperature ranges from 15-20°C. Some chayote varieties may not fruit in areas with recurrent high night temperatures.

SOILS

Chayote can be grown on variety of soils ranging from sandy loam to heavy clay. But for the production of quality fruits well-drained sandy loam soil with moderate moisture holding capacity is found to be the best. It can not withstand water logging. Wet soils restrict root growth and respiration resulting in weak growth and reduced yields. In wet, high rainfall areas it is planted in raised hills or mounds. The plant prefers soil with pH of 5.5-6.5.

FIELD PREPARATION, LAYOUT AND PLANTING

Chayote is traditionally grown in the backyards and kitchen gardens; however, good preparation of the planting area is important to get maximum yield of quality fruits. The field should be prepared properly by repeated ploughing to make soil friable for commercial production. Remove weeds and stubbles. The soil should be made friable since most of its roots are confined in the top 40-50 cm. Deep cultivation improves water absorption by the crop. The land should be prepared to fine tilth and pits of approximately 45 cm x 45 cm x 45 cm at spacing of 3.0 m x 2.0 m are dug during January-February. The pit should be filled with 10 kg well-decomposed farmyard manure. Heavy rain is a problem in Sikkim; therefore, bed should be prepared in such a way that excessive water drains out rapidly without any erosion.

PROPAGATION AND PLANTING

Chayote is mostly propagated by planting the entire fruit. Fruit should be planted at a 45^0 angle with the shoot downward and the narrow stem-end base slightly protruding from the soil line. Deep planting will lead to fruit rot. Chayote can also be propagated by cuttings of the mother plant though plants grown from cuttings do not produce as well in the first year but they will produce the same amount of fruit in subsequent years. Planting either by fruit or rooted cuttings should be done at 3 m x 2 m spacing. Planting should be done in March-April either on raised beds or ridges to prevent water-logging. Planted in spring chayote will bear flowers in late September when the days are as long as the nights generally begin yielding mature fruit in October and producing well into December Chayote can also be propagated from cuttings made in autumn. Growing from cuttings ensures uniformity in plant characteristics from generation to generation and cuttings are free from diseases and pests.

TRAINING AND PRUNING

Pruning can be done for the production of quality fruits and getting new shoots and tendrils next year for vegetable purpose. Pruning should be done after fruit harvesting for this purpose. Prune the plants to ground level during winter from second year after planting. In hills, pruning is done during January. The main vines should be well-trained for proper spreading and most effective use of sunlight, carbon dioxide, and other growth factors. The use of side trellis may be applicable in areas prone to strong winds. The technique can withstand strong winds and with pruning, can enhance higher fruit bearing for the chayote crop. Sun and air circulation are important in suppressing wind-borne plant diseases.

ORGANIC NUTRIENT MANAGEMENT

Organic fertilizers are good for the crop. Basal application of FYM or compost is recommended. Side-dressing of FYM or compost @ 1-2 kg per plant should be done 7 to 8 weeks after planting and repeated every three months. Additional nutrient requirement should be met through green manure, vermi-waste, biodynamic liquid manure *etc*. In Brazil, chayote was found to extract nutrients from soil: N-20; P-3.5; K-5.5; Ca-122.7; and Mg-4 pounds per acre in a 150-day growing cycle. In a 200-day growing season, chayote was found to absorb most nitrogen and phosphorus between 105 and 135 days after planting, and to absorb most potassium between 150 and 165 days after planting. In the 200 days growth cycle chayote removed 48 lbs N; 9.5 lbs P and 10 lbs Ca on a per acre basis. Therefore, appropriate nutrient management is mandatory for obtaining optimum yield.

WATER MANAGEMENT

Chayote needs ample soil moisture for good growth. The water requirement is mostly met with rainfall since it is mainly grown in rainy season. If there is no or scanty rain for long period, then irrigation once in a week at early growth stage should be done.