

Giloy an Immune Modulatory Plant (*Tinospora cordifolia*)

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Article History

Received: 7. 11.2020

Revised: 11. 11.2020

Accepted: 16. 11.2020

INTRODUCTION

The well-known medicinal herb *Tinospora* contains anti-inflammatory and anti-pyretic properties. For centuries, this herb has been used in Ayurveda in India as a medicine in the development of the immune system and the confrontation of the body against certain infecting species (Bhatt et al., 1987). In the immune suppression of such diseases, such as obstructive jaundice, hepatic fibrosis, peritonitis sepsis, *Tinospora* is used as an immune modulator.

Botanical Description

Tinospora is a large glabrous climbing plant; it normally climbs on large trees. It is a twining, succulent-stemmed, with tuberous roots rising quickly. Its branches are grey-green, with a diameter of up to 40 mm, turning brown with age. The leaves are heart-shaped and have a scale of 100 x 100 mm. Its flowers are creamy-greenish and small. On various branches, male and female flowers are produced. The female flowers are accompanied during spring by an oval red fruit up to 10 mm in diameter. During summer and autumn, these ripen (Spandans et al., 2013).

The stems are fleshy and the roots are like long threads, aerial, arising from branches. When exposed to peeled fleshy roots, the bark is thin, greyish or creamy white in appearance. Its seeds are pea-sized, curved

Habit and Distribution:

The species grows usually in any type of climate. The plants are long-lived and often locally abundant. In India it is found in Kumaon to Assam, Bihar, Odisha and South (Sinha et al., 2004).

Uses:

Part Used: Stems and Leaves (Sangeetha et al., 2013).

- It is a very useful treatment for gout and high uric acid.
- It is a natural blood purifier.
- Effective for many types of cancers.

Climate:

It grows well in warm and humid climatic conditions with annual rainfall varying from 2000-3000 mm.

Soil:

It grows well in almost any type of soil. Medium black soil or red soil is the best for the cultivation of *Tinospora*. A well drained soil, rich in organic matter is best for the growth of this plant.

Varieties:

In different agro-climatic regions of the country, a number of geographical races exist like: *Tinospora crispa* and *Tinospora rumphii*.

Cultivation:

It is possible to spread *Tinospora* through seeds and even vegetatively through cuttings. The vegetative approach is the safest way. Tiny finger thickness cuttings are used for a long stem 6 to 8 inches long with two nodes. The cuttings are dipped in 2500 ppm of IBA by rapid dip technique to achieve greater rooting success.

This can be planted in 10 cm x 15 cm sized poly bags. Poly bags packed with a mixture of 1:1:1 of mud, sand and dry cow dung. It takes almost 4 to 5 weeks to root out the cuttings. By this time, the *Tinospora* cuttings will be ready for planting in the main field (Bharathi et al., 2018).

Land Preparation:

The land should be ploughed 2-3 times and then raised beds of size 3 m × 2.5 m are prepared in which pits are dug at a spacing of 1 m × 1 m. The pits are filled with soil mixed with 100 gm compost per pit. To avoid any water stagnation in beds, channels are laid out to drain excess rainwater.

Planting:

The rooted cuttings are planted in the month of May-June in the prepared pit. It requires some support trees preferably Neem and Mango.

Manure and Fertilizers

It is better to grow medicinal plants without chemical fertilizers and the use of pesticides. Organic manures like, Farm yard Manure (FYM), Vermi-Compost, Green Manure etc may be used @ 4 t/ha. However, NPK @ 12:16:16 kg/ha may be used for better growth and development during planting. However, 12 kg N may be top dressed after 2 months.

Irrigation:

The field after plantation should be irrigated periodically as and when required which may vary at weekly or fortnightly intervals.

Inter-culture:

Periodical hoeing is done, both in the nursery and field as per requirement.

Mulching:

When the crop is not irrigated during summer, the beds may be mulched with dry leaves or straw.

Pest and Disease:

Usually, no insect pests or diseases are noticed. However, spotting mold may affect the leaves and stems. This can be cured by spraying Nuvacron with starch.

Harvesting and Yield:

It is possible to achieve the first harvest of *Tinospora* by plucking the leaves without damaging the vines. After three months of planting, it is possible to use growth harvesting at intervals of two months. The yield of 3 t of leaves and stem/ha/year is obtained on average. These leaves are then spread out to dry in the shade on a clean dry floor (Jhosi & Kaur, 2016).

Items of Expenditure	1 st Year
Land preparation- 15 MD @ Rs. 200/day	Rs. 3,000
Cost of rooted cuttings @ 0.40P	Rs. 4,000
Cost of planting- 40 MD @ Rs. 200/day	Rs. 8,000
Cost of manures and fertilizers	Rs. 5,300
Weeding, mulching- 15 MD @ Rs. 90/day	Rs. 3,000
Plant protection	Rs. 750
Irrigation	Rs. 1,000
Harvesting- 25 MD @ Rs. 90/day	Rs. 5,000
Contingency fund	Rs. 5,880
Total	Rs. 35,930

Return	1 st Year
Yield of dry stem and leaves	3 tonns
Total	Rs. 72,000
Net Return	Rs. 36,070

Sale rate @ Rs. 24/- per kg × 3 t = Rs. 72,000/-

NB: - Rate varies from place to place.

CONCLUSION

For all life forms, a plant with a function as varied as *Tinospora cordifolia* is a versatile resource. Guduchi, also aptly called the Divine nectar, is regarded as a potent healing herb. It makes for an important ingredient in any kinds of refreshing tonic, it has a long list of medicinal uses primarily supports the immune system, skin, liver, spleen, stomach, blood, intestine and also used to treat chemotherapeutic side effects. We need to pursue substitute, naturally available methods for the healing of millions of people around the world.

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