

Crop growth under INM in different locations including tuber yield

The INM strategy evolved for tannia after diagnosis and delineation of the nutritional disorders affecting the crop in the acid laterite soils (Ultisols) of Kerala was field tested, demonstrated and popularised through on farm trials throughout Kerala and included in the package of practices(PoP) Recommendation of Kerala Agricultural University (KAU)(Crops, 2016).



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# **Integrated Nutrient Management in Tannia**

*(Xanthosoma sagittifolium L.Schott)*



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Tannia is one of the most important tropical tuber crops grown mostly in South East Asia, West Africa and Central America. In India, it is grown in Maharashtra, Kerala, Tamil Nadu, Karnataka, West Bengal and North eastern states in an area of around one lakh hectares.

### Significance of tannia

It is cultivated for edible tubers (corms and cormels) which are rich source of energy, protein, vitamins and minerals. Young leaves are used as vegetables which contains substantial amount of protein, vitamins and minerals. Since the starch granules in tannia tubers are relatively large, they are mainly used for the production of industrial starch. In some places, flesh scrapings of corm and cormels are pulped and used as anti coagulants, anti tetanus and anti venom agents against tarantula, scorpion and even snake bites.

In India, tannia is grown both as pure crop and as an intercrop in coconut, banana and juvenile rubber plantations. Among the tropical tuber crops, tannia (*Xanthosoma sagittifolium* L.Schott) is regarded as the costliest fetching price @ Rs. 30 to 100/- per kg. Hence, farmers valued it as the most remunerative and the high adaptability crop under the partial shade of coconut, rubber and even banana plantations.

### Nutritional problem affecting the growth and yield of tannia

Being one of the nutritious tuberous vegetable grown locally and regionally, many experiments were undertaken at ICAR-CTCRI to standardize the nutritional requirement of this crop. The crop will be having luxuriant vegetative growth up to 3-4 MAP (months after planting) if other growth conditions like soil moisture, sunlight, relative humidity etc. are adequate.



Luxuriant vegetative growth till 3-4 MAP

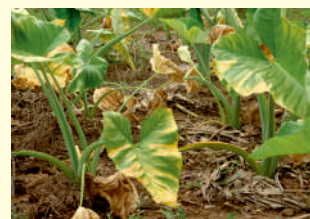


Symptom initiation



Typical symptom

After that, the crop start showing clear and distinguishable symptoms in the foliage which appears as interveinal chlorosis of the older leaves followed by cupping inward and drying (characteristic of Mg deficiency). In severe cases, the entire foliage will dry resulting in complete devastation of the crop. The following integrated nutrient management (INM) strategy was evolved to overcome the above problem.



Symptom spread



Advanced stage



Crop devastation

### INM strategy for tannia

- Application of dolomite as soil amendment @ 1 t ha<sup>-1</sup> (80-100 g plant<sup>-1</sup>) during ploughing and keep the land as such for 2 weeks
- The INM recommendation is FYM @ 25 t ha<sup>-1</sup> along with NPK @ 80:50:150 kg ha<sup>-1</sup>

- Application of FYM @ 25 t ha<sup>-1</sup> (2kg plant<sup>-1</sup>) in pits and P @ 50 kg ha<sup>-1</sup> (Mussooriphos/Rajphos @ 250 kg/ha<sup>-1</sup> or 21 g plant<sup>-1</sup>) as basal
- Plant the *Pseudomonas* treated cormels/corms after shade drying for 4-8 hrs.
- Sow green manure cowpea @ 10 kg ha<sup>-1</sup> immediately after planting tannia in the interspaces and plough and incorporate the green cowpea biomass in the soil at 45-60 days after sowing of cowpea
- Apply N fixer (@10-20 g plant<sup>-1</sup>) within one month of planting tannia
- Apply neem cake (25-50 g plant<sup>-1</sup>) in pits after one month of N fixer application
- Apply 1/3 fertilizer N (urea @ 2 g plant<sup>-1</sup>) and 1/3 fertilizer K (MOP @ 7g plant<sup>-1</sup>) each within 2, 4, 6 MAP.

### Points to be remembered for growing tannia in the major tuber crops growing soils of Kerala viz., laterite and sandy loam soils

- Ensure 25-50% shade (plant under coconut, arecanut, banana and rubber plantations)
- Apply dolomite @100 g plant<sup>-1</sup> as basal in the pits
- Ensure good aeration with proper moisture in the root zone
- Avoid using more of urea. Apply 25% of the recommended dose of N (80 kg ha<sup>-1</sup>) as urea and the remaining as organic manures in the form of FYM, neem cake, green manuring *in situ* with leguminous crops and N use efficient biofertilizers
- Apply the recommended dose of P @ 50 kg ha<sup>-1</sup>
- After one crop of tannia, avoid the land for growing tannia for the next 1-2 seasons