



Nutrient Deficiency Management in Mulberry Cultivation



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Chemical fertilizers

- Apply chemical fertilizers as recommended (NPK- 350:140: 140 kg ha⁻¹ year⁻¹ in 5 splits) and once the organic content improves (>0.65%), curtail 50% of fertilizers.

Fertilizer application schedule for late age commercial garden

Days	Activity
0	Prune all plants at 20-25cm height
3-5	Apply FYM: in two splits - 25 MT ha ⁻¹ year ⁻¹
22	Apply Chemical fertilizers NPK: in five splits - 350:140:140 kg ha ⁻¹ year ⁻¹
25	Seriboost spray (2.5 mL L ⁻¹) Or Poshan spray (7 mL L ⁻¹) one time
32	Seriboost spray (2.5 mL L ⁻¹)

Leaf harvest: 45th day

Fertilizer application schedule for chawki garden

Days	Activity
0	Prune all plants at 30 cm height
3-5	Apply FYM: in 4 splits - 40 MT ha ⁻¹ year ⁻¹ or 16 MT acre ⁻¹ crop ⁻¹ after every pruning
14	Apply Chemical fertilizers* NPK: in eight splits - 260:140:140 kg ha ⁻¹ year ⁻¹
25	Spray Seriboost: 2.5 mL L ⁻¹ Or Spray Poshan: 7 mL L ⁻¹
32	Spray Seriboost: 2.5 mL L ⁻¹
51	Chemical fertilizers as above dosage
60	Spray Seriboost: 2.5 mL L ⁻¹ Or Spray Poshan: 7 mL L ⁻¹
67	Spray Seriboost: 2.5 mL L ⁻¹

Leaf harvest on 35th and 70th day per crop;
 * pH > 6 Ammonium sulphate; pH <6 Urea

Recommendations for correcting nutrient deficiency

- Nitrogen, Phosphorous, Potassium: Apply chemical fertilizers as recommended (NPK- 350:140:140 kg ha⁻¹ year⁻¹ in 5 equal splits).
- Zinc: Spray 0.2% aqueous solution of ZnSO₄ @ 4.4 kg ha⁻¹crop⁻¹ over the leaves, 20-25 days after pruning.
- Iron: Foliar spray of 0.5% FeSO₄
- Manganese: Application of 5-10 kg MnSO₄ (to be mixed with FYM or tank bed silt) and placed between the plant row).
- Seriboost: Recommended for spraying twice per crop @ 2.5 mL L⁻¹ of water. First spray on 25 days after pruning or leaf harvest followed by a second spray one week after the 1st spray.
- POSHAN, the multi-nutrient formulation, can be sprayed @ 7 mL L⁻¹ once per crop per acre after 25-30 days of pruning or leaf picking in the morning hours between 8 and 11 a.m. The safety period of silkworm feed is 48 hours.

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Mulberry (*Morus* spp.) is an economically important perennial tree in sericulture and its foliage is the sole food source for silkworm, *Bombyx mori* L. Production of quality mulberry leaf is needed for rearing of silkworms for commercial production of raw silk. Growth, development and disease resistance in silkworms are greatly influenced by the nutritional quality of mulberry leaves. Poor and inappropriate fertilizer management, climatic changes, non-replenishment of soil nutrient, selection and use of inadequate fertilizer, etc., lead to the reduction in yield and quality of mulberry leaf. Plants need 17 essential elements for their growth and development. Nutrient deficiency can be identified by visual symptoms (hunger signs), soil and leaf analysis.

Management of nutrient deficiency

Integrated nutrient management (INM) practice including organic, bio- and chemical fertilizers is an effective method of producing quality mulberry leaf.

Organic fertilizers

Apply farm yard manure (FYM) @ 10 MT acre⁻¹ in two splits dosage. FYM may be curtailed to 5 MT acre⁻¹ in the subsequent years by augmenting it with organic manure (50%) such as sunhemp (*Crotalaria juncea*) dhaincha (*Sesbania aculata*), cowpea, horse gram, etc.

Biofertilizer

- Apply 8 kg Seri-azo and 2 kg Seri-phos acre⁻¹ year⁻¹ in 5 equal doses (Mix with FYM and apply).
- Bio-fertilizers are applied on 6th to 7th days after pruning.

Nutrient Deficiency symptoms

Nutrient	Deficiency symptoms
Nitrogen	Terminal growth is arrested, plants become stunted, quick yellowing occur in lower leaves and yellowing of the leaves starts from the margin of the leaves and premature leaf fall.
Phosphorous	Chlorosis occurs in young leaves, severely affected leaves show scorching in the margin and become yellow, irregular chlorosis in between veins, irregular lesions may observe below the margins and premature falling of leaves.
Potassium	Terminal growth is ceased, lower leaves turned yellow. Necrosis starts from margin and leaves fall off prematurely.
Calcium	Leaf shape get distorted, necrosis starts from leaf margin and tips. Plants become weak and lodged.
Magnesium	Prominent chlorosis in young leaves. Leaves show chlorosis between veins. Reddish-green patches appear on leaves.
Sulphur	Plants become stunted. Chlorosis and necrosis starts from younger leaves. Brownish oily spots appear all over the leaves.
Iron	Chlorosis occur in young leaves. Lower leaves turn to golden yellow with dusty look. Leaves look complete white colour
Zinc	Chlorosis, scorch yellow and brown colouration and sometimes with darkened veins.
Manganese	In young leaves, chlorosis starts from leaf margin and towards veins and spread to whole leaf. In mature leaves, margins are almost white.
Boron	Plant growth is ceased, veins and lenticels proliferate and protrude out, stems and veins of leaves are cracked.



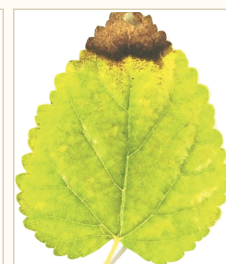
N



P



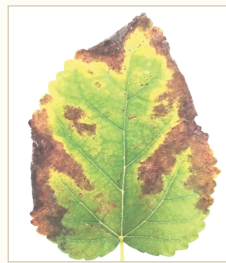
K



Ca



Mg



S



Fe



Mn

Nutrient deficiency Symptoms observed in mulberry leaves

- Apply near root zone, cover with soil and irrigate immediately.
- Apply biofertilizers 15 days before or after application of chemical fertilizers.

Neem oil cake (NOC)

- Apply neem cake @ 200 kg acre⁻¹ once during monsoon or in 5 split doses.

Poshan

- Spray Poshan, a multi-nutrient foliar spray @ 7 mL L⁻¹ after 25 days of pruning.