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How to collect Soil sampling for testing?

Correct diagnosis of soil status depends on correct method of collection of representative soil samples. Number of soil sample to be collecting depends on uniformity of the land. Divide the plot into sub-plots that look different in appearance, soil type etc. Mark 4-5 spots in each sub-plot. Clean the surface, dig a pit of 30x30x30 cm. Scrape a thin layer of soil from top to bottom on all sides of the pit and collect about 250 g. soil sample from each spot. Mix soil samples of a sub-plot thoroughly and spread it on a paper. Divide the sample into four equal parts and reject two opposite parts. Repeat the process and collect 250 g. samples in a polythene cover for testing. In case of problematic soil, collect soil samples at 0-30 cm, 30-60 cm depths. Do not collect soil samples from the extreme corners of the field or immediately after rain or after the application of fertilizer. Label properly and send the samples for analysis.

How to produce Vermicompost?

A thatched shed of approximately 7.5 x 6.0 meters on a slightly elevated ground is sufficient for utilizing sericultural waste from one hectare mulberry area. All around the shed stone bund is to be prepared to prevent infestation of predators. In the shed, eight trenches measuring 2.4 x 0.6 x 0.45 meteres in two rows of four trenches each side are to be made. The trenches are to be lined with polythene sheet. For every tone of waste add 5 kg cow dung / biogas slurry and mix in 100 litres of water in an open pit for about 7-10 days for partial decomposition. Later, fill each trench with 200-300 kg semi-decomposed sericultural waste having 30-40% moisture. Introduce a mixed culture of earthworms into the feed @ 1.5 kg/metric tonne of waste and leave for 6-7 weeks. Sprinkle water regularly to maintain moisture around 30-40%. After 6-7 weeks, the casts appear as loose granules. Harvest the vermi-compost and sieve through wire mesh to separate earthworms.

What are the reasons for low sprouting percentage in nursery bed?

Low sprouting percentage in nursery bed is due to the nursery diseases. The nursery diseases can be controlled effectively by he integration of the following cultural, biological and chemical methods.

1. Cultural methods: [a] Plough the land deeply and expose to the hot sun for about a month. Level the land properly to avoid the water logging. [b] Keep the land free from weeds during establishment of saplings / plants.

2. Biological method: Nursery Guard (a bio-formulation of Trichoderma pseudokoningii developed by CSR&TI, Mysore) can be used for long-term protection and better survivability

and growth of saplings / plants. [a] Mix 1 kg of Nursery Guard (NG) with 60 kg of finely powdered, well decomposed farm-yard manure (FYM). Moisten the mixture with water to about 30% moisture and store it for about a week under shade in the form of a heap, covering with old gunny cloth or newspapers. This enhances the colonization and establishment of biocontrol agent (T. pseudokoningii) in the mixture. [b] For nursery raising, broadcast the activated NG + FYM mixture @ 2 kg/m2 over the well prepared nursery beds and thoroughly incorporate it to the soil by light digging or forking. [c] For direct plantation in the main fields, apply the activated NG + FYM mixture in planting pits @ 50g/pit.

3. Chemical method: [a] Prepare 0.1% solution of Dithane M-45 (Mancozeb 75% WP) by mixing 1 gram of Dithane M-45 powder with 1 litre of water. [b] Soak the stem-cuttings in Dithane M-45 solution (0.1%) for half an hour. [c] Plant the soaked cuttings in nursery beds or in planting pits pre-dusted with Nursery Guard, immediately followed by irrigation.

What are the advantages of VAM in mulberry cultivation?

[a] Vesicular Arbuscular Mycorrhizal (VAM) inoculation for new mulberry plantation: Soil based inoculum of VA-mycorrhiza containing mixed culture of Glomus mosseae and G. fasciculatum is used for raising mycorrhizal mulberry saplings in nursery beds. About 5-6 months old mycorrhizal saplings are transplanted to the main field along with nursery soil containing VAM spores. Phosphorus can be used @ 60 kg / ha / yr instead of 120 kg / ha/ yr after one year of establishment. The VAM inoculation ensures 50% curtailment of chemical phosphorus application in mulberry cultivation without any loss in leaf yield and quality.

[b] Inoculation of established mulberry garden with VA-mycorrhiza: To inoculate an established mulberry garden (more than 2 years old) with VA-mycorrhiza, at first the garden is pruned and intercultural operations are completed. VAM inoculum is applied @ 1000 kg / ha making furrows to a depth of 7.5 - 10 cm in between mulberry rows. After the application of VAM inoculum, maize seeds (local variety) @ 20 kg/ha are sown in furrows at a distance of approximately 5-10 cm from each other for multiplication of VAM in the roots of maize plants and covered immediately. After 40-45 days growth of maize , the plants are cut at the height of 20-30 cm and allowed to grow for another 30-40 days. After 80-85 days, the maize plants are cut to the ground level and maize roots colonized by VAM are incorporated in the soil by ploughing. From the next crop onwards, phosphorus is to be applied @ 60 kg/ ha/ yr in place of 120 kg/ ha/ yr.

What are the advantages of Drip irrigation?

Drip irrigation is the latest method of water management in mulberry. The microtube system of drip is recommended. In spacing of 60 60 cm, 90 90 cm and paired row system one lateral is placed in between two mulberry rows laterally placed . Placement of microtubes in between 4 plants has been found to be economical. The system is run on alternate days. The average peak demand for water in mulberry (in dry season) is worked out as 1.2 litres / plant / day (60 60 cm) and 2.0 litres / plant / day (90 90 cm). FYM is applied in between plant rows in furrows and covered. Fertilizers are applied in pits just below the point of water dripping (between 4 plants).

What are the advantages of Seriboost?

Seriboost is a growth promoter which enhances the growth of mulberry and also overcome

the deficiencies due to micronutrients. Spray schedule : 2 sprays / crop.

1st spray 500 ml in 200 litres of water - 25 days after pruning / leaf harvest.

2nd spray 500 ml in 200 liter of water - 32 days after pruning / leaf harvest.

How to control Jassids?

JASSIDS will be occurring in all seasons. This will suck the mulberry leaf.

Control measures :

Physical measures: By adopting light trap

Chemical measures: By spraying 0.15 % of DDVP (2 ml in 1 litre of water)

First application: 100 ml (after 10 days of bottom pruning).

Second spray: 100 ml (after 25 days of bottom pruning).

Repeat the application for every crop.

How to control Tukra disease in mulberry?

Tukra disease is caused by mealy bug (*Maconellicoccus hirsutus*) and is considered as the most serious pest of mulberry. The pest sucks the sap from the tender leaves and shoots, which results in the malformation of the apical shoot. The affected plants show wrinkling of leaves, reduced inter-nodal distance resulting in stunted growth and reduction in yield. The incidence of tukra is severe during summer months. The integrated management measures for control of this pest involves the following :

1. Clipping the Tukra affected apical portion of mulberry and burning it.

2. Keep the plot and its surroundings free from weeds, which may serve as host plants to mealy bug.

3. Spray 0.2% DDVP prepared in 0.5% soap solution after pruning / harvesting of plants twice at an interval of 10 days (safe period 17 days).

4. Release predatory ladybird beetle Cryptolaemus montrouzieri @ 250 adults/acre.

What are the control measures for root rot disease?

Now a days, root-rot disease is becoming very serious and is caused by the fungus Fusarium solani and F.oxysporum. The disease appears in all types of soil and climate throughout the year. The disease appears in isolated patches in the garden and spreads quickly to surrounding areas. Infected plants show the symptoms of sudden withering of leaves followed by drying / death due to decaying of root.

Control measures:

1. As soon as the symptom appears, uproot the infected plants and burn it. Remove the soil up to one foot from the infected spot. Dust the pits with 3-4 g Dithane M-45 and plant new sapling after treating the root system in 0.1% Dithane M-45 solution for 30 minutes.

2. Raksha - a bio-fungicide developed by CSR&TI, Mysore for effective control. (i) For established garden : Mix 1 kg of Raksha (for 100 plants) with 50 kg FYM and store under shade for a week maintaining 30% moisture content and apply the mixture @ 500 g / plant around the root zone (ii) While replanting in the failure pits, apply 500 g of mixture per pit, plant the saplings treated with 0.1% Dithane M-45 solution for 30 minutes and cover with soil followed by irrigation.

How to control Root Knot disease?

Root knot caused by a nematode, Meloidogynae incognita is one of the most serious and widely distributed diseases of mulberry. It is more prevalent in sandy soil under irrigated farming system. The disease is soil borne in nature and spreads through contaminated saplings, implements and cultivation of susceptible crops along with mulberry. The affected plants show stunted growth, marginal necrosis and chlorosis of leaves. The under ground symptoms include the formation of knots / galls on the roots.

Control measures: As mulberry is a perennial crop, it is difficult to control the disease by a single method. Therefore, integrated approach is recommended.

1. Apply neem / pongamia oil cake @ 2 MT / ha/year in four split doses.

2. Apply Bionema, a bionematicide of Verticillium chlamydosporeum developed by CSR&TI, Mysore. Mix 1 kg of Bionema with 24 kg Neem oil cake and 200 kg FYM and store for a week in shade maintaining 30% moisture content. Apply the mixture @ 200 g/plant around root-zone and cover with soil followed by irrigation.

3. In severe cases, apply nematicide Furadan 3 G (Carbofuran) @ 40 kg/ha/year or Sebufos @ 30 kg/ha/year in four split doses for effective control of disease (Safe period 40 days).