

Water jetting technology: An eco-friendly approach towards managing sucking pests

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Sucking insects are considered to be most notorious group of pests. They possess piercing and sucking type mouth parts with slender needle like stylet to pierce the plant cell in order to suck the juice from leaves and stems. These pests considered being more severe in damaging crop and their complexes are identified until advanced stages of infection. They are also responsible for fungal growth as they secrete honey dew which promotes growth of black sooty mould on plant leaves that also attract Ants. These sap suckers deplete the nutrient value of the leaves and makes the leaves unpalatable and in case of severe incidence growth of plant stunted. Some of them also inject toxic materials into the plants while feeding, which lead to wilting of plants. They also act as vector and transmit plant diseases.

Natural control of Sucking Pests

Sucking pests are naturally controlled during rainy season. When it rains heavily, many small insects get dislodged from plant surfaces by the combined effect of wetness, kinetic energy of the rain drops and strong winds. This observation gave an idea to researcher of Silk Board to develop a water

jetting package which attempt to apply the physical force of water against the sucking pest menace in mulberry cultivation.

Water Jetting Technology as a new component of IPM

Spraying strong jet of water is one of the component recently added in IPM. It is recommended to manage the sucking pests like thrips, aphids and mites etc., under both agricultural and horticultural crops. In this technology, the pests are dislodged and washed-out from the plants with strong jet of water and the pest population kept below economic injury level (EIL). This practice is effective and eco-friendly, but it consume bulk quantity of water which is a serious constraint for many agro-ecological regions. Care should be taken during flowering stage of the crop. This approach can be utilized by diverting irrigation water for jetting. This technology also conserves natural enemies in ecosystem.

Water jetting system in Mulberry Garden

Water jetting concept utilizes spray of strong jet of water to manage the sucking pests. This technology is found to be highly successful against major sucking pests of mulberry viz., pink mealybug, *Maconellicoccus hirsutus*,

papaya mealybug, *Paracoccus marginatus*, mulberry thrips, *Pseudodendrothrips mori*, spiralling whitefly, *Aleurodicus dispersus*, mulberry whitefly, *Dialeuropora decempuncta*, jassid, *Empoasca flavescens* and mites etc. These sucking pests cause severe damage to mulberry leaf yield and quality. This technology found to be effective for control of these pests in mulberry garden in which a portion of irrigation water from the main pipeline was diverted through a garden hose for jetting.

Study Results of water jetting technology Vs Chemical measures

Sakthivel et al studied comparative efficacy of water jetting technique (by diverting a portion of irrigation water) with chemical measures against some major sucking pests of mulberry. The results shows that the water jetting at 15 and 25 days after pruning (DAP) of mulberry plants was found to be effective in controlling sucking pests. It is also observed that chemical measures drastically reduced the population of insect pest for a short period of time but at long term shows detrimental effect on natural enemies. Highest population of natural enemies were observed in the water jetted plots with slight or no deleterious effect on predatory coccinellids and spiders. Hence it is more viable option for sustainability, especially for

region where water availability is not a big constraint.

Benefits of Technology

Farmers' supply water for irrigation as well as sufficient flow quantity can use for generating water pressure to hit the lethal pests and wash them out from plants. Farmers' who do not have pipeline across the garden can establish the system for one acre at a cost lesser than that of the cost of a high volume sprayer. In case of sericulture, chemical measures to control pests in mulberry garden are not possible after initiation of silkworm rearing. But water jetting can be done at any moment if pest incidence is noticed even after initiating silkworm rearing. Another benefit of water jetting is that it removes dust from the leaves which increase photosynthetic activity and silkworm also prefers dust free quality leaves which results in increased silk productivity and income of farmers.

Conclusion

Water jetting technology is highly effective, eco-friendly, user-friendly, economic and could bring solution to the pesticide issues which possess' great threat to environment. Chemical measures are not sustainable for long term as its use lead to development of resistance, especially in case of sucking pests. At the same time, it destroys natural

enemy complex because of their high sensitivity towards chemicals. The repeated chemical measures often results in the sudden outbreak of sucking pests i.e., resurgence. Hence this technology can be included in IPM package of practice for managing sucking pests.

References

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