

Insect Pest management through Organic Amendments in Pulse Crops

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Introduction

Indiscriminate use of chemical pesticides in agriculture has resulted in several associated adverse effects such as ecological imbalances, environmental pollution and climate change which are the serious issues being faced by many developing countries. For managing the

insect pests of pulse crops, farmers rely on chemical insecticides. Effects of these synthetic insecticides are well documented in the context of the resurgence of sucking pests, resistance to the pesticides, adverse effects on non-target organisms (Sharma, 2014).

What is organic farming?

It is holistic production management system that promotes and enhances health of agro ecosystem, including biodiversity, biological cycles and soil biological activity. Organic farming is a production system that sustains the health of soil, ecosystem and people (FAO, 1999).

- An organic amendment is any material of plant or animal origin that can be added to the soil to improve its physical properties including water retention, permeability, water infiltration, drainage, aeration, structure *etc.*
- Organic farmers claimed that plants grown with organic amendments are much more resistant to insect pests and

diseases than plants grown with synthetic inorganic fertilizer amendments.

- The use of organic amendments applied to soil not only enhances its nutrient status but also reduces the incidence of pest (Adilakshmi *et al.*, 2006).
- Neem cake contains better terpenoids mainly azadirachtin which is responsible for the antiovipositional, antifeedants, growth distrusters, fecundity and fitness reducing properties on the insect apart from plants nutrients (Alam, 1993).
- Organic amendments have effective suppression of specific insect attacks by various forms (Patriquin *et al.* 1995).

Advantages of organic amendments

- Eco-friendly in nature
- Resistance development is less common
- They have no proven environmental hazards, have low mammalian toxicity
- Naturally occurring
- No or little adverse effect on beneficial

insects and plants

- It is effective against insecticide resistance species of insects
- Rapid degradation so has less residual activity

Disadvantages of organic amendments

- It requires long term planning
- Labour intensive

- Should be applied at specific time and specific stage

- Slow mode of action
- Require continuous use
- No complete control

- Limited application
- Lack quick knock down effect

Management

Patel et al. (2010) studied the effect of various organic manures with inorganic fertilizers on insect pest of cowpea and found that alone FYM application is quite effective to reduce major sucking pest population as compare to combine application of manure and fertilizer. Neem cake shows efficient results into reducing mean pod borer as well as sucking pest population in cowpea.

Irulandi et al. (2012) studied the effect of organic amendments on the incidence of pod borer (*Lampidars boeticus*) in French bean and stated that FYM, neem cake, different biofertilizers and inorganic fertilizers show good result with the application of neem oil @ 2% in reducing the pod borer damage at a great extent.

Parsaeyan et al. (2012) evaluated the effect of LC₂₀ concentration of diatomaceous earth and spinosad on preimaginal duration and adult longevity of *Callosobruchus maculatus* shows that highest percentage of mean reduction in adult longevity done by diatomaceous earth treatment. The effect of LC₂₀ concentration of

diatomaceous earth and spinosad on fecundity and fertility of *Callosobruchus maculatus* shows that diatomaceous earth causes great reduction in mean fecundity rate and egg hatching rate.

Bommesha et al. (2014) tested various organic manures and found that among different organic manures, poultry cake and neem cake is effective to reduce the population of pod bug and pod fly in pigeon pea respectively. PM and NC also showed synergistic effect to reduce pod bug and pod fly population.

Bhist (2020) observed that desi cow urine, neemastra, jivamrit and panchgavya were found very effective for the management of gram pod borer, *H. armigera* infestation on chickpea without affecting its natural enemy, *Campolrtis chloride* population. These formulations were also found very effective as growth retardant against *H. armigera* under controlled conditions. Cow urine products having strong antifeedant action which causes very low mean pupal and adult weight compared to untreated pest.

Conclusion

Today's aim is to manage soil health so organic amendments are major ingredient for improving soil fertility as well as managing the pest. Application of organic amendments viz., FYM, vermicompost, different cakes and other organic matter, reduce the population of different insect pests in pulses and other crops, it can also reduce the soil insect pests and also

reduce the problem of residue, resistance and soil pollution. Diatomaceous earth used against different stored pulses. These practices also improve the soil condition and enhance the uptake of nutrients and after a long period this strategy certainly is helpful to the farmers which are compatible with IPM programmes.

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