

## **Integrated Pest Management in Indian mustard (*B.juncea* L. Czern Coss)**

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### **Introduction**

Brassica juncea L. Czern. and Coss., alternatively known as Indian, Oriental or Brown mustard, is widely believed to be one of the earliest domesticated plants, with mustard known as a condiment (spice) since early times. It is described in Sanskrit and Sumerian texts from as early as 3000 BC (Hemingway 1995). *B. juncea* initially spread to Europe in the Middle Ages as a medicinal crop and was later grown as a vegetable for human consumption. Today, *B. juncea* is used world wide as an oilseed, a condiment and a vegetable. In terms of area and production mustard stands in second place among oilseeds in The average yield of mustard and Toria in India is 7.5 quintal/hectare.

In Indian mustard major losses are due to diseases, insects and pests which restrict the production. To overcome this a scientific approach is must require which is known as Integrated pest management (IPM).

### **What is IPM?**

IPM is such an approach which entails ideal use of the most effective, economically safest, ecologically sustainable and sociologically acceptable combination of physical, chemical and biological methods to limit the harmful effects of crop pests.

### **Important facts about IPM**

- In 1967 term 'IPM' was given by R.F.Smith and R.Vanden Bosch.
- Term 'IPM' was formalized by U.S. national academy of sciences in 1969.
- IPM was adopted as policy by various world governments during the 70's and 80's including the USA(1972).

- In 1985 India declared IPM as official ministerial policy.

### Objectives of IPM

Rapeseed and mustard are most important rabi oilseed crops of our country. Major bottleneck in it's production is reduction of yield due to pest attacks. Insects and diseases are appears important limiting factors which restrict the fast expansion of cultivation and productivity of these crops.

One of the major concerns in enhancing and stabilizing the yield of Rapeseed and mustard is the incidence of insects and diseases which are causing the damage to crop at different stages and responsible for huge yield losses to a extend ranging from 10 to 90%. So our main concern is to prevent our crop from these losses by the use of various prevention techniques of IPM.

### Application of Ipm

In mustard there are much losses occurred by several diseases, insects and weeds so ultimately production falls down. IPM provides various methods and ways to normalize the condition and in this techniques we used a combination of methods. Now, how it control or manage the problems, let's know-

**(1) Insects:** Mustard is highly vulnerable to large number of insect pests. About 50 insects are known to damage brassica crops. Among these insects Mustard aphid (*lipaphis erysimi*) is the key pest of brassica crops while saw fly (*Athalia proxima*), painted bug(*Bagrada cruciferarum*) causing yield losses.

Yield losses due to aphid may be up to 97% and saw fly and painted bug up to 15% and 30% respectively. The period of peak activity for aphids is January- February. The economic thresh hold level (ETL) for aphid in rapeseed-mustard for different states has also been worked out.

**Management:-** Crops should be sown at optimum time recommended for particular area. The mustard sown before 15<sup>th</sup> October in North India often escapes aphid damage. Use balanced dose of fertilizers, overuse of fertilizers particularly nitrogen attract more aphids.

Plucking and destruction of infested twigs or plants at initial stage of attack is very useful. Plucking the infested leaves and bury them in soil helps in the reduction of the pest.

- (2) **Diseases:** Expression of full inherent genetic potential of a genotype is governed by inputs that go in to the production system. Production has to be increased vertically taking in to account the exploitable yield reservoir. The losses in oilseed crops due to biotic stresses is about 19.9%, out of which diseases cause severe yield reduction at different growth stages. Various plant pathogens are reported to affect the crop. Among them, 18 are considered to be economically important in different parts of the globe. In India, the following diseases cause considerable yield losses. Disease like Alternaria blight and white rust cause about 10-70% damage.

**Management:-** Choosing the sowing time is very important as it affects the disease incidence significantly. Deep summer ploughing. Use of disease resistant or tolerant or early maturing disease escaping cultivar. Use of good quality seed. Seed treatment with biocontrol agents viz., *T. viride*, *G. virens* or botanicals like *Allium sativum* bulb extract (1 % w/v) or carbendazim @ 0.1% a.i. or mixture of carbendazim with Apron 35 SD (6 g/ kg). There is a need for mixture of fungicides for avoiding resistance development in pathogens to fungicides. Use of biocontrol agents is advantageous as they are often effective against a wide range of soil-borne pathogens. Moreover, they are ecofriendly, cost effective and their use avoids the risk of development of resistance in the pathogen towards the control agent. Application of recommended doses of N, P and K fertilizers with split application of N<sub>2</sub> Maintaining optimum plant population with recommended spacing. Proper drainage to avoid water stagnation.

- (3) **Weeds:** Weeds in mustard; *Phalaris minor*(28.2%), *Avena ludoviciana*(25.2%) and *Lolium temulentum*(19.2%). Broad leaves weeds like *Vicia sativa*, *Coronopus didymus* and *Anagallis arvensis* as a whole constituted 26.7% of total weed Flora. Yield losses due to crop-weed competition in Rapeseed and mustard have been estimated to the tune of 10-50% (Gill et al.1989, Bhan 1992, Banga and Yadav 2001)

or even beyond 23-70% depending upon the type, intensity and duration of competition in gobhi sarson(Chopra and Saini 2007).

Competition by weeds at initial stages is a major limiting factor to its productivity. Manual weeding at 3-4 weeks after sowing is the most common practice to control weeds in Indian mustard.

The most common herbicidal weed control measure recommended in Indian mustard is the pre- emergence application of pendamethalin (0.75kg/hectare).

### **Conclusion**

Most of the farmers are unaware about IPM technologies. The knowledge regarding of IPM technologies should be higher than other methods. IPM is to be used at the farmer's level and therefore it needs to be converted from a scientist-oriented to a farmer- oriented concept. Extension efforts need to be intensified to educate farmers about different methods of IPM technologies, its application according to topography and nature of crops.

There is a distorted view of IPM as pest control without chemical or biological control, in fact IPM is based on the optimization not elimination of chemical pesticides. The IPM approach encompasses all available control techniques to contain and combat the pest infestation with the aim of lessening the pesticides load in the environment.