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Efficacy of various IPM modules on biotic pressure and green forage yield in a forage production system (cowpea + BN Hybrid – berseem mixed with mustard + BN Hybrid)

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Introduction

Various control measures by themselves are not free from one or the other limitations to provide safe, economically viable and efficient in pest population suppression. The economics is much more relevant when we talk of low value commodity like forage crops. Viewing this multifaceted problem and inherent limitations of each control method the ultimate solution lies in integrated pest control expedient. The connotation of the approach is to utilize all the possible methods of control including maximum exploitation of naturally existing populations and regulating factors in as compatible manner as possible to keep the pest population levels below economic threshold. Earlier, IPM in fodder crops has been worked out by Shri Ram and Gupta, 1989; Pandey *et al*., 2000; Shah *et al*., 2011.

Materials and Methods

An experiment with fifteen IPM modules was laid out in three replications with split plot design at Central Research Farm of IGFRI, Jhansi. In main plots various sowing dates while in subplots different treatments including eco-friendly ones were experimented. Seed treatments were thiomethoxam + pencycurone (@ 0.5gm/kg seed); thiram + carbendazim + carbofuran (@0.025%); tricho XP (@ 5gm/kg seed); N S P (neem seed powder) @ 50gm/kg seed and no seed treatment while the sprays were imidacloprid + tebuconazole (@ 0.025% conc.); endosulfan (@0.07%) + mancozeb (@0.09%); azacel (@ 0.15%conc.); NSKE (neem seed kernel extract) @ 3 % and no spray. The varieties planted were BN hybrid (IGFRI-10), cowpea (BL1), Berseem (JHB-146) and mustard (local).

Results and Discussion

Of various sowing dates 1st week of July sowing in combination with seed treatment of thiomethoxam + pencycurone and foliar spray of imidacloprid + tebuconazole on 45 days old crop was found to be the most effective IPM module (62.31% reduction in the root rot (*Rhizoctonia bataticola* (Taub.) Butler) intensity, 47.83% reduction in leaf spot (*Cercospora cruenteae* Sacc.), 34.30% reduction in flea beetle (*Pagria signata* Motsch.) incidence, 61.30% reduction in semilooper (*Plusia nigrisigna* Walker) damage, 67.65% in grasshopper (*Hieroglyphus nigrorepletus* Bolivar) damage and 40.62% reduction in plant parasitic nematodes (*Meloidogyne incognita* Goldi.) in cowpea and 64.52% reduction in leaf blast (*Pyriculareae graceae* Herbert) and 40.39% in grasshopper (*Hieroglyphus nigrorepletus* Bolivar) damage in BN hybrid was recorded. This treatment yielded maximum GFY (69.03 t/ha, an increase of 13.84% over control) (Table-1). During Rabi, IPM module having first week of November sowing + seed treatment of thiomethoxam + pencycurone along with foliar spray of imidacloprid + tebuconazole 10 days after each cut of berseem was found to be the most effective as this module significantly reduced biotic pressure on the crop (56.41% reduction in the root rot intensity caused by *Rhizoctonia solani* Kuhn. and *Fusarium semitectum* Berk. in berseem, 75.88% reduction in aphid population (*Lipaphis erysimi* Kalt.) and 53.04% reduction in plant parasitic nematodes (*Tylenchorhynchus vulgaris* Upadhyay) and yielded maximum GFY (88.35 t/ha, an increase of 18.10% over control) (Table-2). The effect of various eco-friendly micro-organisms and earthworms were also studied. It was observed that in all the IPM modules studied the population of bacteria, Fungi, Actinomycetes and predatory nematodes were increased. The presence of earthworms was also higher in all the modules experimented. Thus the eco-friendly approach of pest management indicates no unsound effect on beneficial micro-organisms.

Conclusion

The research outcome suggests the aptness of IPM for the management of biotic stress factors. The economics of experimented IPM modules also works out to be adequate in low value commodity like Forage crops.

References

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