

Studies on Pesticides Residual Effect on Maize and Lucern Green Fodder

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ABSTRACT: The presence of pesticide residues in feed and its animal products is in the focus at the present scenario in the view of WTO. The residues not only affect the public health but also cause economic losses to the livestock industry. Not only these affect the health of livestock and human beings but also affect the quality of animal products. Pesticide residues accumulate in the animals either by direct contact with pesticide or by indirect contact with environment. Considering same present investigation, entitled “Studies on pesticides residual effect on maize and lucern green fodder” was conducted at Department of Animal Husbandry and Dairy Science, Post Graduate Institute, Dr PDKV, Akola for period 90 Days. Three treatments were studied namely T₁ – Nutrient management through organic manure and bio-pesticide for maize fodder, T₂ –Nutrient management through fertilizer and IPM for xv maize fodder and T₃ – Nutrient management through fertilizer and pesticide for maize fodder.

The results of metarhizium and neem seed extract application on term of residues on Maize and Lucerne fodder under treatment T₁, T₂, T₃, T₄ was below level of quantification, while- coragen pesticide application residues treatment in T₅, and T₆ was recorded i.e. 0.144 and 0.050 mg per kg, respectively.

Keywords : FYM, Chemical fertilizer, Pesticides, IPM, Residual effect.

INTRODUCTION

Green fodders play important role in the profitability of the livestock production. The objective of the increased milk production can be met only through ensuring availability of good quality fodder in balanced ratio. Success of dairy farming is largely depends on the feed and fodder of high nutritional value, which accounts for 65-70 per cent expenses incurred over the animal feeds. The demand of green and dry fodder will reach to 1012 and 631 million ton of by the year 2050 respectively. At the current level of growth in forage resources, there will be 18.4 % deficit in green fodder and 13.2% deficit in dry fodder in the year 2050. In the country, there is major problem of low quality crop residues for forage requirement of livestock which is not enough for maintenance of animal health and productivity (Kumar *et al.*, 2012). Cereal-legume intercropping has been recognized as a beneficial crop production system for higher fodder production per unit area per unit time (ICAR-IGFRI, 2015). Maize and Lucerne are highly demanding fodder crops grown as fodder crop. In India having highest population of different livestock and it require feeds and fodder. Maize crop good nutritionally quality and digestibility to livestock. Pests and diseases must also be managed to minimize their impact on productivity. Excessive and imbalanced use of pesticides their residual effect in fodder affects health,

production and reproduction in livestock in addition to this chemical fertilizers has adversely affected the soil causing a decrease in organic carbon reduction by microbial flora of the soil, and increasing use of nitrogen fertilizer is contaminating water bodies thus affecting fish fauna and causing health hazards to human beings and animals. Begum, (2003); Mannivannan *et al.*, (2001) reported that pesticide affect the quality of dairy products by inhibiting the metabolic activities of starter bacteria. Reddy and Reddy (2015) noted that fodder maize and jowar retained residues even during harvesting which were sprayed during early stages of growth. Prasad and Chabra (2001) reported that concentrate to be an important source of pesticide residue intake by animals. Sandhu (1980) and Unnikrishnan (1998) reported that apart from pesticides used for crop production, their indiscriminate usage during storage also play a role in the case of oil cakes, grains and milling products. Hence the efforts were made in the present investigation to grow maize and lucern under organic and inorganic condition and find out its residual effect in the fodder.

MATERIAL AND METHODS

The present investigation was carried out in the Department of Animal Husbandry and Dairy Science, Dr. PDKV Akola, during the year 2019-20 for a period

of 90 days. Treatment Details: T₁ – Nutrient management through organic manure and bio-pesticide for maize fodder, T₂ –Nutrient management through fertilizer and IPM for xv maize fodder and T₃ – Nutrient management through fertilizer and pesticide for maize fodder. The field with well fertile and good water holding capacity soil was selected followed by tillage operation i.e. ploughing operation was carried on before research work start. At that time applied FYM (Farm Yard Manure) @ 5 tonnes as per the treatment of research plot .Then other tillage operation was carried like harrowing on the ploughed plot. African tall variety was selected for sowing of maize fodder The sowing performed on 1 hectare field area required 75 kg seed of maize fodder. Application dose of fertilizer for particular treatment i.e 100: 50:50 kg NPK per hectare was applied for maize fodder. At the time of sowing applied half nitrogen, full phosphorus and potassium. Remaining nitrogen dose applied 40 days after sowing of maize fodder. The pest attack was observed on maize fodder after 60 days of sowing .The pheromone traps use at the time pest infestation in the maize fodder. Most of the seedling leaves and growing point infestation of armyworm pest observed. Therefore,

applied the spray of metarhizium @ 4 ml per 10 litre of water on treatment plot T₁. Other spray the Neem Seed Extract @ 4 ml per 10 litre of water, clean the weed and burned the plant debris on treatment plot T₂. Also spray the coragen @ 4 ml per 10 litre of water on treatment plot T₃. The yield of fodder obtained from cutting of fodder crop weight in ton. The sample was taken at 50 % flowering of green fodder. The green fodder seedling cut down and collected the sample of five seedlings of each treatment for analysis. The collected sample make quartered and taken the green fodder sample having weight 1000 gm in the plastic bag having pouch. Collected maize and Lucerne sample were send to National Horticultural Research and Development Foundation, Pesticide Residue Analysis Laboratory Chitegaon phata, Darna Sangvi Tq. Niphad, District Nashik (Maharashtra).

RESULTS AND DISCUSSION

The data pertaining to pesticide spraying residue on maize and Lucerne fodder at different treatments are presented in Table 1.

Table 1: Pesticide residue level of green fodder.

Treatments	Replications				Mean (mg/kg)
	R-I	R-II	R-III	R-IV	
T ₁	BLQ	BLQ	BLQ	BLQ	BLQ
T ₂	BLQ	BLQ	BLQ	BLQ	BLQ
T ₃	BLQ	BLQ	BLQ	BLQ	BLQ
T ₄	BLQ	BLQ	BLQ	BLQ	BLQ
T ₅	0.147	0.141	0.145	0.143	0.144
T ₆	0.054	0.049	0.047	0.051	0.050

(BLQ= Below the level of quantification)

It was observed that the metarhizium and neem seed extract spraying residues was below level of quantification in the treatment T₁, T₂, T₃ and T₄ and level of quantification was 0.001 mg/kg respectively. The below level of quantification residue analysis was not recorded in machine. However, coragen pesticide residues were recorded in T₅ and T₆ treatment and mean level of quantification was 0.144 and 0.050 mg /kg. The results recorded in the present investigation are also supported and in agreement with results recorded by NHRDF (2020) reported that coragen pesticide residues on maize fodder were 0.147 mg/kg and coragen pesticide residues on Lucerne fodder was 0.054 mg/kg at 50 percent flowering stage of green fodder. Kaur and Nagra (2006) who observed that insecticide residues detected in green fodder were HCH, DDT, endosulphan, chloripyrifos, aldrin and chlordane with mean residue level 0.51, 0.33, 0.12, 0.37, 0.08 and 0.01 mg/kg respectively. Upadhyay *et al.*, (2021) also reported that Biological control agents are the core to Integrated Pest and Disease Management (IPDM) strategy with a defined objective of sustainable agriculture. With the current food production strategy involving lots of chemical input raised the cost of produce and threat to the environment leading to the foundation of biological management practices. He

further suggested that Bio control agents reduce acute and long-term impacts of chemicals on humans, animals, non-target organisms as well as environment. It also reduces the specific risk to water and the environment in ecological term. It behaves like homoeopathic medicines, i.e. has the capacity for permanent reduction of soil and foliage borne pathogen. No need of safeners thus cutting its costs and danger to the farm workers. Also surging organic food demand by consumer is pulling their use till now. Biological management techniques are also being used in domestic applications as mosquito abstract. Example: Citronellol oil. Example: The risk of pest resurgence is lower (Moazami, 2019, Cumagun, 2012).

CONCLUSION

The results of metarhizium and neem seed extract application on term of residues on Maize and Lucerne fodder under treatment T₁, T₂, T₃, T₄ was below level of quantification, while- coragen pesticide application residues treatment in T₅ and T₆ was recorded i.e. 0.144 and 0.050 mg per kg respectively.

FUTURE SCOPE

Such type of research and their findings are useful to identify the proper ways and means in respect to use of

chemical fertilizers, chemicals and their effect on the quality of fodder. Residual effect of pesticides, chemicals in the fodder is defiantly hazardous for the health of animals. Research in this field will give directions and help to produce chemical free and safe good quality fodder for the animals.

Conflict of interest. To produce good nutritional quality and safe fodder for the livestock.

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