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Environmental Awareness & Socio-economic development in Rural Area :Issues, Problems & Remedies

Pesticides and Integrated pest management of agricultural & horticultural economy from Beed district (M.S.) India.

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ABSTRACT

Globally India ranks fifth both in area & production of higher yield of crops yeild of crops from agriculture & horticulture. All economically important crops are attacked by several insect & non-insect pests including nematodes in various agro-climatic zones of the Beed district & therefore, a lot of pesticides belonging to different groups of chemicals are being used for suppressing their population below the economic Threshould Levels (ETLs) with the intention to minimise the damage from pests for obtaining high yield of pest-free crops. The application of such toxic pesticides in pest management programme is associated with a lot of residues problems ; especially, if their quantities remain above the maximum levels in crops, it was observed that the literature on pesticides residues of chlorinated, organophosphatic & carbamatic pesticides have been estimated by various workers from different part of the country Such studies sugget that persistant chlorinated or cyclodiene pesticides should not be applied in soil while managing soil pests like cutworms, white grubs, red ants, nematodes, fungi, bacteria, rodents, mites, weeds, insects etc. as their toxic residues are long lasting. On the other hand, the pesticides belonging to other two grops reffered above could be used for suppressing pest population if applied in suggested/recommended dosages/ concentrations at right time in proper manner & suggested waiting periods alongwith advocated storage durations & processings of crop grains for safeguarding the consummers from health hazards are strictly adhered.
The present paper deals with the I.P.M. associated with pests suppression from various agro-climatic area's of the the Beed district alongwith suggestions for minimising the magnitude of pesticides.

INTRODUCTION :

The acclimatization & improvements of the agricultural & horticultural crops are better to improve the national economy as compared to traditional cereals. These plants grow in almos all types of soils except in highly alkaline & saline soils. The different plants newly introduced in agriculture & horticulture are often tested & then introduced to prevent various plant diseases & pests are as follows-

1. **Crop Plants** :- Potato, tomato, sweet potato, cotton, soyabean, ground nut etc. from U.S.A., China, Central Asia & Russia.
2. **Fruit plants** :- Coconut, pineapple, pumpkin, banana, grapes etc. from U.S.A. & South Asia.
3. **Vegetable Plants** :- Cabbage, onion, lettuce, chilli etc. from Europe.
4. **Plants of other economic importance** :- Tea, coffee, cocoa, tobacco etc. from China, Africa & U.S.A. all these crops grow all the year round in one part or the other.

Nutritionally all the above mentioned agricultural & horticultural crops contains all major nutrients required for good health. The balance of proteins to calories, the balance of the more important aminoacids, minerals & vitamins make the crops second only to eggs in mutrutional value a good food source. Besides, it produces more well-balanced protein & more calories per unit area & time than any other major traditional food plants. These valuable crops are attacked by more than 100 species of arthropods & 88 species of Nematodes which in accordance with their mode of feeding & habitat are grouped into four categories - 1) Soil pests 2) defoliators/foliage feeders 3) sucking /sap feeders & 4) storage pests (simpson, 1977, Rataul & Misra, 1979, Saxena & Misra ; 1983, Misra 1992.)

For Controlling these pests, the chemical control is still considered as most effective & popular weapon for combating pests because of its quick action & assured protection to crops. Obviously, a lot of residue problems are associated with the use of toxic pesticides, especially when these are applied injudiciously i.e. without bothering for Economic Threshold Levels (ETLs) of pests & recommended dosages/concentrations. All these practicals & genuine problems have necessitated the studies on the determination of toxic residues on/in crops grown from insecticides treated fields with a view to safe-guarding the consumers from health hazards.
This reviews the work done on pesticides & integrated pest management in various agro-climatic zones of Beed district area (M.S.) India.

DISCUSSION :

After going through the literature of agricultural & horticultural plants the paper turned out to be the pesticides & IPM from Beed district (M.S.) India

The pests are groups of organisms like insects, rodents, nematodes etc. Which cause damage to cultivated crops. The cultivation of same types of plants in the same place years after years provided readily available hosts to various types of pests such as insects, nematodes, rodents, bacteria, fungi etc. Alongwith the development of agriculture, there

is simultaneous increase in pests attacking several agricultural &organization of united nations has estimated that 1/3 of all the food grown is lost to pests & diseases, either from growing crop in the field or in store after harvest. This demands the application of protective measures against the pests, one of them is use of pesticides.

On the basis of types of pests they control, pesticides are classified into folloing groups -

1.Fungicides
2.Bactericides
3.Insecticides
4.Herbicides
5.Nematicides
6.Rodenticides
7.Acaricides

On the basis of their chemical nature, pesticides are classified as

1. Organochlorines :- eg. DDT, BHC, dieldrin, lindane.
2. Organophosphates : eg. Parathion , melathion.
3. Carbamates :- eg. Carbaryl, pirimicarb.
4. Pyrethroides :- extracted from chrysanthemum spe. but recently being pro duced synthetically to provide new group of insecticides called synthetic pyrethroides.
5. Traizines : - Atrazine, ametryn.

Mode of action of pesticides :

On the basis of their mode of action, pesticides are classified as -

1. Stomach pesticides :-eg.Lead arsenate, paris green.
2. Contact pesticides :- eg. DDT, pyrethrum.
3. Systemic pesticides :- eg. Carbon tetrachloride (gas), hydrogen cyanide (gas), ethylene dichloride (vapour).

Benefits of pesticides : -

1.Increase the yeild of crops.
2.Improving public health programme.
3.To protect stored food grains in the godowns.
4.Other pests like domestic animal pests, Animal husbandry pests, pests of stored food, pests causing damages to books, wooden articles etc. can be kept under control by pesticides.

Hazards of pesticides :-

1. Due to toxic nature, they kill the domestic animals like cats, Dogs etc. economically important animals like honeybees, poultry birds etc. Some times human beings also.
2. pesticides pollute the air
3.Some pesticides polluting water.
4.Pesticides enter in the food chain & making entire ecosystem imbalanced.

Alternatives to pesticides :-

1.Machanical control : - eg. Cricket insects are killed by machinary or manual operations like X-rays, alpha-rays, gamma-rays.
2.Biological control :-
i) Predators :-Like frogs, hen, predaceous insects etc. attacking harmful pests.
ii) Parasites :- Nematodes as parasites on beetles, grasshoppers etc.
iii) Pathogens :- Fungi, Bacteria, viruses causing diseases to insects & animal pests.

3.Cultural practices :-

i) By rotation
ii) Deep ploughing
iii) Change in irrigaion system.

Integrated pest management (IPM) :- (Brader, 1979)

After going through the literature of IPM, any one of the methods so far the discribed is not fully effective in controlling the pests. Excess use of pesticides damage the ecosystem hence the concept of IPM in which all the methods are used in combination to cause minimum damage. IPM in its broadest sense embraces control of all the pests that includes plant diseases, weeds, insects & all other animal pests.

The essential components of IPM are as follows -

1.An understanding of the factors that regulates the pest population.
2.The determination pest damage threshould, i.e.manuring them just below dam aging levels.
3.Means of controlling populations of pests & their natural enemies.
4.Selective manipulation to minimise the pest populations.

Conclusions :-

After going through the literature on pesticides & IPM on/in plants of agricultural & horticultural economy from Beed district, it could be concluded, that persistant chlorinated & cyclodiene insecticides like DDT, BHC, lindane, aldrin, hepatochlor, chlordane, taxaphene etc. should be avoided to apply in soil for managing soil pests like cutworms

white grubs, red ants, termites etc. as they are known to leave their toxic residues on in plants to their MRLs for longer durations. Instead, some safer & potential insecticides like chlorpyriphos, carbaryl, quinalphos, endosulfan, phorate. carbofuran etc. could be used for this purpose.

Steps suggested for minimising the magnitude of pesticides :-

1. Awarness about adverse side effects & health hazards due to injudicious use of pesticides chemicals resulting excessive residues must be popularise among farming community & other pesticide users.
2. None of the pesticidal schedules, for managing the pests, should be recommended & release for use until & unless their residues are not estimated throughly through multilocational trials for different agro-climatic zones of the vast country like ours.
3. One should not simply play with the toxic pesticides being used for plant protection purposes without knowing their properties, mode of action & guidelines given on their containers.
4. The era of applying fixed pesticidal control schedules of any formulation without bothering for the appearance of pests, their magnitude of damage, economic threshold levels (ETLs) & cost benefit ratio has now gone hence only the practice of need based/ judicious use of pesticides should be followed.
5. Broad spectrum , safe & effective pesticides having low mammalian toxicity causing least ecological disturbance should be identified for limited use in IPM.
6. There is a vast scope for classical Biological control in India hence it must be exploited for reducing the pressure on chemical pesticides.
7. Cultural practices such as the use of resistant cultivators, right time planting & harvesting of crop at recommended depth, adaptation of suitable crop rotations, proper weeding, earthing & irrigation, clean harvesting, roguing & haulm (foliage) cutting etc. although appear simple but have significant role in pests suppression. Hence, these practices must be exploited via well linked extension services.
8. With the growing knowledge in genetic engineering & molecular biology, new techniques are fast evolving in the gene manipulation, gene magnification, creation of mutants etc. these could be exploited in expression of insect toxic genes, neuroinhibitors, virus protein genes, antisense gene ets. in cultivated plant species for evolving transgenic plants & minimising entire dependence on pesticides.
9. Instead of solely depending on toxic pesticides for pests management we should go for integrated pest management (IPM) by combining all the, economically effective & viable, pest control components i.e. cultural, physical, mechanical, ecological, legal with need based & bare minimum use of toxic pesticides. The IPM has saveral merits

(i) It fits into the national economy of developing countries like ours.
(ii) More efficient & long lasting cheaper control could be achieved.
(iii) It does not upset the balance in nature.
(iv) It avoids or atleast delays the development of pesticides resistants in pests &
(v) It minimises the residue hazards resulting from the use of toxic pesticide chemicals.

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REFERENCES :-

1. ATTRI B.S., Lal R., Dewan R.S. and Pandey S.Y. 1976 Residues of aldrin Etemon. 1(1) 55-58
2. Chawla R.P., Kalra R L.& JOLA B.S. 1981. absorption of residues of soil applied aldrin and hepatochlor in crops Indian J. Ent.43:226:271.
3. Dikshit A.K. and MISRA S.S.1985. Residues of endosulfan and carbary in crops at harvest and after storage. Indian J.Plant prot. 13(1) 105-108.
4. Dikshit A.K. MISRA S.S. and Lal L. 1985. carbary and endousulfan residues in crops pesticides. 19(9) 44-46.
5. Maini P collina A and passarini I) 1972 . Residues of chlorpyrifos in various crops. II)- Residues after field treatment. pesticide sci-3(5)533-538.
6. Majumdar S.K. 1971. Implications of pesticide residue in food and the development of selective protectants. In : proceedings of all India symposium on progress and problems in pesticide Residue analysis P.U.A., Ludhiana, India. PP.10-32.
7. MISRA S.S.1992 crop pests and their management past, present and futures In : Abstracts of first conference of Azra on Impact of Applied Zoological Researches, on food production and environment cuttack, Orissa, 22-24 December, 1992 PP 10-11.
8. MITRA S.N. & Roy S.C.1955 Residual DDT in preserved crops, Possibility of toxic hazards. J. Proc. Instn. chem. Indian 27:233-241.
9. PINGLE S.W. Muthu M.& Kapur N.S.1954. The effect of persistance of DDT & BHC residues on stored crops. Indian J.Ent. 16(2): 189-195.
10. Rataul H.S. & MISRA S.S.1979. Pests and their control pesticides 13(7) : 27-38 &42.