

Study of Various Bio-products Used as Pesticides and Fertilizers in Agricultural Practices - A Review

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ABSTRACT

Large amount of chemical fertilizers and pesticides are used to fulfill the demand of population which leads in to the different types of pollution. Tremendous use of chemical fertilizers and pesticides shows adverse effect on the health of human and animals. It also decreases the fertility of soil. Though the quantity of agricultural product is increased but the quality of agricultural products is getting down which directly affects the export value. In modern era farmers are turning towards the organic farming rather than the inorganic farming because they are aware about the side effect of chemical pesticides and fertilizers. The present study focuses on the use of bio-products as a pesticides and fertilizers to conserve the health of soil, farmer and environment.

Keywords : Bio-Products, Chemical Fertilizers and Pesticides

I. INTRODUCTION

To fulfill the demand of basic needs of exploited population farmers use chemical fertilizers and pesticides. Nowadays farming is the main business of rural people for economy. Lack of organic fertilizers and pesticides and also to get the more income in less time there is no option to use the chemical fertilizers and pesticides. The overuse of these chemical fertilizers and pesticides leads to water pollution, soil pollution and air pollution^{1,2}. Due to continuous used of these chemicals insect or pests developed their resistance power against chemical insecticides. To overcome these problems different chemical fertilizer and pesticides companies launch the new and deadly poisonous inorganic insecticides. The drawback of these chemicals is that these pesticides and fertilizers leave their residue in soil and also in plant products and because of this lots of health related problems in human and domestic animals arise². It also affects the export of the agricultural products. These chemicals also destroy the flora and fauna of the soil^{1,2,3}. To overcome these problems it is the time to come back towards organic farming Hence different workshops, seminars and research works are organized having the aim to develop and use different organic pesticides and fertilizers. Not only researcher but also some farmers developed their own techniques to formulate different bio products as pesticides and

fertilizers. Now it is essential to use bio products to increase the fertility of soil, pest control, and quality of crop yield, economical condition of poor farmer and also to control the pollution. The present review focuses on the use of bio-products as a pesticides and fertilizers to conserve the health of soil, farmer and environment.

II. METHODOLOGY

1. Information is collected from literature, different articles and research papers.
2. Discussion and interview with farmers who uses bio-products for farming.
3. Own farming practices.

III. DISSCUSSION

All the available bio-products used by farmers are presented in following tables

A. Bio-products used as pesticides

i) Plant Origin bio-products

Sr. No.	Name of bio-product	Source	Uses
1	Neem leaf extract	Neem(Azadirachta indica) tree	To control caterpillars, grasshoppers, beetles and mites
2	Neem seed oil	Neem(Azadirachta indica) tree	It used as a insecticides To control nematodes
3	Neem dry leaves	Neem(Azadirachta indica) tree	To control store grain pest
4	Dry leaf extract	Neem(Azadirachta indica) tree	As a Fumigant to control household pest
5	Neem bark and root extract	Neem(Azadirachta indica) tree	To control fleas and sucking pest in rice
6	Dry leaves	Garlic	To control store grain pest
7	Leaf extract	Garlic	To control root knot nematodes in tomato
8	Leaf powder of gram seed	Gram seed	To control the pulse beetle
9	Tobacco leaf powder	Tobacco plant	Leaf eating bugs and beetles, spiders and mites To control larvae pest
11	Nilgiri seed and leaf extract	Nilgiri tree	Used against Jassids, Aphids, Scales
12	Chilli powder	Red chilli plant	To control different pest, fruit borer, leaf eating caterpillar brinjal fruit and shoot borer
13	Lemon oil	Lemon fruit	To kill aphids, mites, fire ants, paper wasps and house crickets
14	Wood ash	Any tree	Use around the bottom of crop to control aphids Used as a insect repellent in chilli and tomato crops Use for preservation of seed
15	Dhatura plant extract	Dhatura plant	Use to control thrips, aphids, termites
16	Rui (calatropis gigantea) leaf extract	Rui plant	To control termites
17	Leaf extract	Lantana camera	Beetle and leaf minor
18	Peel extract	Orange fruit	As a insect repellent like mealy bugs, slugs, aphids, fleas, mites, fire ants, paper wasps
19	Dashparni arc	Different leafs	To control all type of insect, pest and caterpillar

ii) Animal Origin bio-products as pesticides

Sr. No.	Name of bio-product	Source	Uses
1	Vermiwash	Earthworm	Antibacterial, antifungal
2	Fish oil	Fish	Insect repellent
3	Human urine	Human	Herbicides
4	Cow urine	Cow	Fungicides Insecticides

B) Bio-products used as fertilizers

i) Plant Origin bio-products

Sr. No.	Name of bio-product	Source	Uses
1	Seed cake	Neem seed	Increased rate of photosynthesis Used as fertilizer and control the growth of harmful bacteria Increased the water holding capacity Maintain the nutrient value and fertility of soil
2	Drumstick leaves	Drumsteak (<i>Moringa oleifera</i>)	Growth stimulation of different crops
3	Tag	Whole plant of tag (<i>Crotalaria juncea</i>)	Used as fertilizer and weed controller
4	Slurry	Different grains	Used as fertilizer

ii) Animal origin bio-products used as fertilizer

Sr. No.	Name of bio-product	Source	Uses
1	Vermicompost	Earthworm (<i>Eisenia fetida</i>)	Used as fertilizer
2	Fish waste	All type of fish	As a fertilizer
3	Cow dung and cow urine	Cow	Used in preparation of different slurry
4	Mixture of milk egg and jaguar	Cow, Hen,	Used as a fertilizers
5	Cow urine	Cow	Growth stimulant antimicrobial agent
6	Jivaamrut		Growth stimulant Control the different pests

IV. OBSERVATIONS

1. Fish oil, Neem seed cake are readily available in market.
2. Different formulation such as Jivamrut, slury is available in market as well as farmers can easily prepare it for their own use.
3. Many vermiculture units (small scale and large scale) are maintained by the farmers.
4. Formulation of different useful bacteria are available in market.
5. Different plant extracts are freshly prepared and used by farmers.
6. Bio-products suppliers easily supply different bio-products as per demand at the village level.

V. CONCLUSIONS

All above bio-products are frequently used by farmers in Maharashtra

All these bio-products are beneficial, biodegradable and do not show any adverse effect on human and environmental health. Regular and excess use of these products is not harmful at certain level. All these products are easily available, economical and eco-friendly. Use of bio-products helps in improving soil fertility, and also helps to improve quality, quantity and nutrient value of the crop yield. Economical value of this crop yield is also high. Because of this economical condition of farmer will be better and it helps to reduce the suicide of farmers.

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