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Knowledge of Respondents about Bio-Fertilizers in Hisar District

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Abstract: ***A bio-fertilizer is a substance which contains living microorganisms which, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the host plant.. The study was conducted in two villages of block Adampur in Hisar district of Haryana. Sixty respondents (30 males and 30 females) were selected from each village. The data were collected with the help of developed inventory. The results showed that majority of respondents had overall low knowledge about bio-fertilizers.***

Keywords: Bio-fertilizers, knowledge, types, benefits, methods

1. Introduction

A bio-fertilizer is a substance which contains living microorganisms which, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the host plant **(1)**. Bio-fertilizers add nutrients through the natural processes. The microorganisms in bio-fertilizers restore the soil's natural nutrient cycle and increases soil fertility. Through the use of bio-fertilizers, healthy plants can be grown, while enhancing the sustainability and the health of the soil. It increases crop yield by 20-30%, replaces chemical nitrogen and phosphorus by 30%, and stimulates plant growth. It can also provide protection against drought and some soil-borne diseases. Bio-fertilizers are "eco-friendly" organic agro-input.

Rhizobium, Azotobacter, Azospirilium and blue green algae (BGA) are some bio-fertilizers used for agriculture. It maintains the natural habitat of the soil.

2. Review of Literature

Datta et al. (2006) [(2)] explained that the seed treatment with rhizobium leguminosarum and soil bunch with FYM one week before sowing of rajmash increased yield. Seed treated with rhizobium and FYM increases Nitrogen fixation with net positive balance of 42 and 84kg Nitrogen, respectively. It showed positive impact on growth stages of rajma.

Gaur (2006) [(3)] revealed that azotobacter promotes seed germination and growth. Azotobacter use with rhizobium + PSB (phosphate solubilising bacteria) for chickpea increased dry matter accumulation, crop yield, and chickpea's protein value, dry fodder yield of maize, nitrogen and phosphorus uptake and soil health.

Khalil and Gomaa (2014) [(4)] reported the pathogenic invasion of organic vegetables was dependent upon the usage of organic fertilizers, the bacterial inoculation dose and the plant species which varied widely.

Kumari et al. (2014) [(5)] reported that in human diet, the average intake of pesticide residues in mg/day/person in different countries were - USA 7.6, UK 12.0, Canada 13.3, Australia 20.0, Germany 149.0, Europe 156.0, Indian non-vegetarians 356.3 while Indian vegetarians intake was 362.5 which was the highest intake of pesticides residues. These chemicals affected the human health and created problems like affect on central nervous system, respiratory and gastro intestinal system, depression, insomnia, oral acetomatism, myoclonus and hyper reflexia, infant diseases, methaemoglobinemia, cancer, asthama, alzeimers and bone diseases, neurological toxicity, growth retardation, cognitive delay, kidney, damage in nervous and immune system, lungs

Soffer (2016) [(6)] explained that chemical pesticides contaminated air, water and soil and increased the health problems like many types of cancer, nervous system diseases, weak immune system in children and reproductive problems in the people. Chemical pesticides also damaged the soil health, killed the beneficial organisms and polluted the environment.

Objective

To study the knowledge level of respondents about bio-fertilizers

3. Methodology

The study was conducted in Hisar district of Haryana state selected. One block, Adampur from Hisar was selected randomly and from block, two villages were selected randomly. Sixty respondents (30 males and 30 females) were selected from each village through random selection and total 120 respondents were taken for the study. A well structured inventory was developed and the data were collected personally by the researcher. The collected data was quantified and interpreted by using statistical tools such as frequency and percentage.

4. Results

Knowledge of respondents about bio-fertilizers

Under bio-fertilizers, knowledge about types of bio-fertilizers, methods of application, precautions and benefits of bio-fertilizers were covered.

Types of bio-fertilizers

Table 1 revealed that 43.3 percent respondents had knowledge about rhizobium for legume crops followed by blue-green algae (BGA) and azolla for paddy (34.1%), azotobacter for non-legume crops (27.5%), phosphotika and azotobacter culture for enriched compost (27.5%), acetobacter for sugarcane (24.1%), celluloytic fungal culture (20.0%) respectively. Knowledge for use of phosphorous was reported by 18.3 percent respondents.

Table 1: Types of bio-fertilizers

Sr. No.	Statements	Hisar F (%) (n = 120)
i)	For nitrogen	
	Rhizobium for legume crops	52 (43.3)
	Azotobacter for non-legume crops	33 (27.5)
	Acetobacter for sugarcane	29 (24.1)
	Blue-green algae (BGA) and Azolla for paddy	41 (34.1)
	Phosphorous	22 (18.3)
ii)	For enriched compost	
	Celluloytic fungal culture	24 (20.0)
	Phosphotika and Azotobacter culture	33 (27.5)

Methods of applying bio-fertilizers

Table 2 brought to light that 46.6 percent respondents had knowledge about use of bio-fertilizers for seed treatment followed by seedling root dip (37.5%) and soil treatment (19.1%).

Table 2: Methods of applying bio-fertilizers

Sr. No.	Statements	Hisar F (%) (n = 120)
i)	Seed treatment	56 (46.6)
ii)	Seedling root dip	45 (37.5)
iii)	Soil treatment	23 (19.1)

Precautions for using bio-fertilizers

Data in table 3 presented that 37.5 percent respondents had knowledge about right combination of bio-fertilizers have to be used followed by no mixing of other chemicals with bio-fertilizers (34.1%), bio-fertilizers are living products so store in cool and dry place (26.6%), keep away from direct sunlight and heat (22.5%) and bio-fertilizers are not the replacement of chemical fertilizers (20.0%) respectively.

Table 3: Precautions for using bio-fertilizers

Sr. No.	Statements	Hisar F (%) (n = 120)
i)	Store in cool and dry place	32 (26.6)
ii)	Keep away from direct sunlight and heat	27 (22.5)
iii)	Right combination of bio-fertilizers have to be used	45 (37.5)
iv)	Do not mix with Other chemicals	41 (34.1)
v)	No replacement with chemical fertilizers	24 (20.0)

Benefits of bio-fertilizers

Data regarding benefits of bio-fertilizers reported that majority of respondents (47.5%) believed that bio-fertilizers are safe for soil health followed by harmless (41.6%), supplement to fertilizers (40.8%), reduces the cost of chemical fertilizers (38.3%) and 25.0 percent replace chemical nitrogen and phosphorus (36.6%), and respectively. Approximately thirty four percent respondents had knowledge about that bio-fertilizers restore natural soil fertility followed by save the plants from drought, soil born diseases (31.6%), eco-friendly and cost effective (30.8%), increase the quality of crop production (25.0%), stimulate plant growth (23.3%) and around 21.6% respondents had knowledge that bio-fertilizers increases crop yield respectively.

Table 4: Benefits of bio-fertilizers

Sr. No.	Statements	Hisar F (%) (n = 120)
i)	Safe for soil health	57 (47.5)
ii)	Increase the quality of crop production	30 (25.0)
iii)	Harmless	50 (41.6)
iv)	Increases crop yield	26 (21.6)
v)	Replace chemical nitrogen and phosphorus by 25%	44 (36.6)
vi)	Stimulate plant growth	28 (23.3)
vii)	Save the plants from drought and soil born diseases	38 (31.6)
viii)	Restore natural soil fertility	41 (34.1)
ix)	Cost effective	37 (30.8)
x)	Supplement to fertilizers	49 (40.8)
xi)	Eco-friendly	37 (30.8)
xii)	Reduces the cost of chemical fertilizers	(38.3)

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