

ADVERSE EFFECTS OF CHEMICAL FERTILIZERS AND PESTICIDES ON HUMAN HEALTH AND ENVIRONMENT

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ABSTRACT

The greatest challenge of today's agriculture is to feed the growing population and restore the natural resources. Global food production needs to be doubled by 2020 and just to maintain the present precipitate food consumption. Uncontrolled population growth in developing countries accelerated the imbalance between human needs and sustainable use of land. Though by virtue of chemical fertilizers the production and productivity of crops has increased, the increased use of pesticides has posed many environmental and health problems. The chemical fertilizers and pesticides used over a long period of time have adverse toxic effects on the production potential of the land and the ultimate consumers of the products. The intent of this paper is to cover some adverse effects of chemicals on health of the consumers as well, how these affect the future generations by logging high residues of poisonous chemicals in the soil. It is therefore most necessary to reduce the dependence on chemical inputs in agriculture. This is possible only through ecofriendly approaches of farming system.

Key words: chemical fertilizers, ecofriendly, pesticides.

INTRODUCTION

One of the major concerns in today's world is the pollution and contamination of soil. More than 300 million pounds of different chemical poison are now produced in the form of fertilizers and pesticides under different brand names (Tomkins & Bird, 2002). Excessive use of synthetic fertilizers and pesticides has caused tremendous harm to the environment as well affects human population indirectly. Continues use also results in developing resistance of the pest, which become difficult to control by other means. The use of synthetic chemical fertilizers leads to imperfectly synthesized protein in leaves, which is responsible for poor crops and in turn for pathological conditions in humans and animals fed with such deficient food (Talukdar *et.al.*,2003).

Results and Discussion

Toxic residues of agricultural chemicals entering the human diet are of major concern today. The average dietary intake of pesticide residues in mg/day/person in various countries is as follows.

Countries	Pesticide residues in mg/day/person
USA	7.6
UK	12.0
Canada	13.3
Australia	20.0
Germany	149.0
Europe	156.0
India -Non vegetarians	356.3
Vegetarians	362.5

(Source: Organic horticulture, TNAU)

Indians take about 40 times more pesticides through food items than the average American intake. Excessive use of chemical fertilizers causes environmental pollution both at the manufacturing and application sites. When water soluble nitrogen fertilizers are applied to the soil, a good portion of added nutrients does not become available to the plants, but is lost to the ground water through leaching or run off. The excess nitrate leached in to rivers or ponds encourages the growth of organisms and thus a lot of organic matter produced which on decomposition lead to bad smell, which has an adverse effect on health.

Foods grown with chemical fertilizers caused various deteriorating health hazards in animals as well as human beings. The following are some of the effects:

- Residues of pesticides and herbicides affect the central nervous system, respiratory and gastro intestinal system of human beings. Some pesticides can also cause wheezing and nausea by irritating the lungs if large amounts are inhaled.
- Chemical residues also cause depression, insomnia, oral acetomatism, myoclonus and hyper reflexia of man.
- Accumulation of excess nitrogen in plants causes an infant disease, methaemoglobinemia
- Amines produced from the nitrogenous fertilizer cause cancer in human beings
- Aluminum at high levels leads to birth defects, asthma, alzheimers and bone diseases.
- Calcium toxicity results in developmental and neurological toxicity, growth retardation, cognitive delay, kidney, nervous and immune system damage.
- Cobalt only at high levels leads to lung damage.
- Boron causes low sperm count, nose, throat and eye irritation.

- Manganese is suspected to damage the respiratory reproductive and gastro intestinal systems.
- Lindane can cause breast cancer and acts as nerve poison. It also affects the reproductive system and is known as carcinogen.
- Chloropyripos can cause fetal malnutrition, pneumonia, muscle paralysis and even death to respiratory failure.
- Malathion can damage nervous system, if it enters the body.
- DDT (Dichloro diphenyl trichloro ethane) a common insecticide, affects the nervous system and could acts s a carcinogen. Women diagnosed with breast cancer were six to nine times more likely to have the pesticides DDT or hexa chlorobenzene in their bold streams compared to women who did not have breast cancer. There is a strong association between breast cancer and exposure to chemical pesticides.
- The excessive application of potassium fertilizers decreased vitamin c and carotene content in vegetables an excessive application of nitrogenous fertilizers increased the incidence of pests and diseases in crop plants. 60 percent of all herbicides (weed killers), 90 percent of all fungicides (mold killers) and 30 percent of all insecticides (insect killers) are potentially cancer causing.

It is therefore most necessary to reduce the dependence on chemical inputs in agriculture. The following remedial measures can be taken up gradually to fight against these problems.

Remedial measures

Eco-friendly approaches for farming system:

The following eco-friendly approaches are as:

A. Organic farming: Organic farming is a production system, which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. To the maximum extent feasible, organic farming system rely upon crop rotations, crop residues, animal manures, lagumes, green manures, off-farm organic wastes, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control to maintain soil productivity and tilth, to supply plant nutrients, and to control insects, weeds, and other pests.

B. Biological farming: Biological farming allows the use of selected chemical fertilize3rs (avoiding disruptive materials such as anhydrous ammonia and potassium chloroxide) and adopts low-inputs approaches to use of herbicides and insecticides. (diagnostic instruments to monitor plant and soil conditions are frequently used in biological farming. These include refract meters to monitor sugar content (Brix) in plant tissue sap; electrical conductivity meters to monitor ERGS (or energy releasedper gram of soil); ORPS meters (or oxygen reduction potential of soil); and radionics.)

C. Regenerative Agriculture: In regenerative agriculture bunds on nature's own inherent capacity to cope with pests, enhance soil fertility, and increase productivity. It implies a continuing ability to recreate the resources that the system requires. In practice, regenerative agriculture uses low-input and organic farming systems as a frame work to achieve these goals.

D. Permaculture: Permaculture is the harmonious integration of landscape and people providing their food, energy, shelter and other material and non- material nedds in a sustainable way. Permaculture is concerned with designing ecological human habitats and foodproduction systems, and follows specific guidelines and principles in the design of these systems. To the extent that permaculture is not a production system, per se, but rather a land use planning philosophy, it is not limited to a specific method of production. Thus, practically any site-specific ecological farming system is amenable to permaculture.

Conclusion

The small amounts of pesticides that remain in the food supply will cause no immediate reaction but could cause health problems if routinely consumed over a long period. An answer to this is the bio fertilizers, an environmentally friendly fertilizer which is being used in many countries. Hence, there is an urgent need to transfer this technology on the farmer's field and in to an industry by producing these fertilizers on large scale.

References

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