

HARMFUL EFFECTS OF AGROCHEMICAL APPLICATIONS TO HUMAN HEALTH

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ABSTRACT:- The industrialization of the agricultural sector has increased the chemical burden on natural ecosystems. Pesticides are agrochemicals used in agricultural lands, public health programs, and urban green areas in order to protect plants and humans from various diseases. However, due to their known ability to cause a large number of negative health and environmental effects, their side effects can be an important environmental health risk factor. The urgent need for a more sustainable and ecological approach has produced many innovative ideas, among them agriculture reforms and food production implementing sustainable practice evolving to food sovereignty. It is more obvious than ever that the society needs the implementation of a new agricultural concept regarding food production, which is safer for man and the environment.

KEYWORDS:- Agrochemicals, Environmental health and Food sovereignty.

INTRODUCTION:-

Soil, the basic need of farming may happen to pollute by the accumulation of various heavy metals, through emissions by industries, mining process, disposal of high metal wastes, gasoline, application of fertilizers, sewage sludge, pesticides, wastewater irrigation, coal combustion residues, etc. Historically, a large amount of chemicals is annually applied at the agricultural soils as fertilizers and pesticides. Such applications may result in the increase level of heavy metals, particularly Cd, Pb, and As in the soil (Atafar et al. 2010). Usage of pesticides, insecticides and other various chemicals in agriculture is very easy, quick and inexpensive solution for controlling weeds and insect pests. However, use of chemicals comes with a significant cost. They have contaminated almost every part of our environment and

their residues are found in soil, water, land and air. Kumar et al. (2013) concluded that pesticides are often considered a quick, easy and inexpensive solution for controlling weeds and insect pests in urban landscapes. Pesticides have contaminated almost every component of our environment. Pesticide residues are found in soil and air, and in surface and ground water across the nation, and urban pesticide uses contribute to the problem. Pesticide contamination poses significant risks to the environment and non-target organisms ranging from beneficial soil microorganisms, to insects, plants, fish, and birds. Contrary to common misconceptions, even herbicides can cause harm to the environment.

The use of chemicals in various industries and household products has increased greatly over the years. However, many of these chemicals can have harmful effects on human health when not used or handled properly. Chemical exposure can cause a range of health issues, from short-term symptoms such as skin irritation and respiratory distress to long-term effects such as cancer and reproductive harm. It is important to understand the potential dangers associated with chemical exposure and take necessary precautions to protect human health. Chemical exposure can have various negative impacts on human health, including:

- Toxicity and poisoning
- Cancer and reproductive harm
- Respiratory issues
- Hormonal disruption
- Neurological damage
- Skin irritation and allergic reactions
- Environmental pollution.

This current review aims at highlighting the urgent need for a new concept in agriculture involving a drastic reduction in the use of chemical pesticides. Given the fact that the health effects have been extensively

discussed in the current literature, this paper focuses on the major chronic health effects and recent findings regarding health effects that have been associated with exposure to common classes of chemical pesticides, i.e., organochlorines, organophosphates, carbamates, pyrethroids, triazines, and neonicotinoids. More emphasis is given to the widely used herbicide “glyphosate,” which is an organophosphate pesticide very closely related to current agriculture (Baylis AD, 2000). The important health effects, as discussed below, reveal the urgent need for implementing alternative solutions.

MATERIALS AND METHODS :-

To study the harmful effects of chemical applications on human health, researchers typically use a combination of observational and experimental methods. Observational methods include:

- Case studies
- Surveys
- Retrospective studies
- Cohort studies
- Experimental methods include:
 - In vitro studies using cell cultures
 - In vivo studies using animal models
 - Controlled human exposure studies

Both observational and experimental methods have their strengths and limitations, and researchers often use a combination of methods to obtain a comprehensive understanding of the harmful effects of chemical exposure on human health. Additionally, various analytical techniques such as chemical analysis, biomonitoring, and imaging may be used to measure chemical levels in biological samples and assess the impact on human health.

RESULTS AND DISCUSSION :-

The need for protection against pests is a given and has its roots in antiquity, when both organic and chemical substances were applied as pesticides (Panagiotakopulu E et al., 1995). Since then, numerous chemical pesticides

have been produced, and now multinational agrochemical companies, which mostly control global food production, apply new chemical substances with pesticide properties and implement biotechnological advances, thus diverging from traditional agricultural methods. Furthermore, current agricultural practices are based on the wide use of chemical pesticides that have been associated with negative impacts on human health, wildlife, and natural environment (Pimentel Dand Burgess M. 2014, Goulson D. 2014).

Agrochemicals are chemicals that are used in agriculture to improve crop yields and protect them from pests and diseases. While they can be effective in increasing crop production, the use of agrochemicals can also have harmful effects on human health. Here are some examples of these effects:

Pesticide exposure: Pesticides are chemicals used to kill insects, weeds, and other pests that can harm crops. Pesticide exposure can lead to acute poisoning, respiratory problems, cancer, and neurological disorders.

Soil and water contamination: Agrochemicals can enter the soil and water, contaminating these resources and posing a risk to human health. This can result in food and water contamination, leading to health problems like cancer, reproductive disorders, and developmental issues.

Food contamination: Agrochemicals can also contaminate food, either during production or through improper storage and handling. This can lead to health problems like cancer, neurological disorders, and hormonal imbalances.

Antibiotic resistance: The use of antibiotics in agriculture to promote growth and prevent disease in livestock can contribute to the development of antibiotic-resistant bacteria. This can pose a serious threat to human health by making infections harder to treat.

Occupational hazards: People who work in agriculture and are exposed to agrochemicals on a regular basis can experience acute poisoning, respiratory problems, and other health issues.

The use of agrochemicals can have harmful effects on human health, including pesticide exposure, soil and water contamination, food contamination, antibiotic resistance, and occupational hazards. It is important to take measures to minimize these risks, such as using safer, more sustainable agricultural practices and implementing strict regulations on the use of agrochemicals.

It is important to note that the effects of chemical exposure may not be immediately apparent and can take years or even decades to manifest. Moreover, the effects can also be cumulative, meaning that repeated exposure to low levels of chemicals can have a greater impact over time. The results of studies on the harmful effects of chemical exposure underscore the importance of using chemicals safely and responsibly to protect human health and the environment.

The discussion of the harmful effects of chemical applications on human health highlights the need for further research to fully understand the complex relationships between exposure and health outcomes. One of the major challenges in studying the effects of chemical exposure is the large number of chemicals in use and the lack of information about their toxicity. Many chemicals are used in everyday products, but have not been thoroughly tested for safety. Another challenge is the variability in susceptibility among individuals, as some people may be more sensitive to the effects of chemical exposure. Moreover, the interactions between chemicals and the synergistic effects of multiple chemical exposures are not well understood.

It is also important to consider the sources of chemical exposure, such as occupational exposure, environmental exposure, and exposure through consumer products. Effective interventions and regulations to reduce exposure and protect public health will require a better understanding of these sources. Finally, the discussion of the harmful effects of chemical exposure highlights the need for continued efforts to develop safer alternatives to potentially toxic chemicals. This may include the use of green chemistry principles to design less toxic

chemicals, as well as the development of alternative products and technologies that reduce the use of hazardous chemicals. The discussion of the harmful effects of chemical exposure underscores the importance of continued research and action to protect human health and the environment.

CONCLUSION:-

In conclusion, chemical exposure can have a range of harmful effects on human health, from short-term symptoms to long-term consequences. Despite ongoing research, many remains unknown about the complex relationships between exposure and health outcomes, and effective interventions to reduce exposure and protect public health will require further research and action. It is important to be aware of the potential dangers associated with chemical exposure and take necessary precautions to protect oneself and the environment. This may include reducing exposure through safer products and technologies, as well as advocating for stronger regulations and policies to protect public health and the environment. The conclusion highlights the need for continued attention and action to address the harmful effects of chemical applications on human health.

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