

Pesticide Consumption on Agriculture in Western Maharashtra: A Geographical Perspective

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Abstract: *The role of pesticide is most significant among various agrochemicals in the sense that these act as protective umbrella for other inputs. After using other inputs such as H.Y.V. seeds, irrigation fertilizers machinery, etc. the crop is destroyed by pest and diseases; the entire investment is lost. The farmers in study region are aware of the importance of this input in agriculture. But farmers have inadequate knowledge for using intimaie and quantity too. The use of pesticides for Jawar, Wheat, Rice, Soyabean, Sugarcane, Grapevine cultivation, Pesticide may be classified as insecticides which control insects, fungicides which kill pathogens causing diseases to the plant rodent cider to kill rodent's weedicides or herbicides to control unwanted plants and nematicides to control nematodes. The Western Maharashtra region is located in Maharashtra State. It covers an area of 57235 Sq .Km With comprise five district i.e Pune, Satara, Sangli, Kolhapur and Solapur and population of about 23449049 as per 2011 census. The major river system is Bhima and Krishna. In this present analysis, both primary as well as secondary data have been used. The high consumption (above 30gm/hectare) Tasgaon,Kagal,Hatkanagale,Wai,Phatltan,Panhala,Karveer,Bhudargad,Bawda,Shirol,Walwa,Palus ,Mahabaleshwar tehsils of the region. The Research paper is examined Pesticide technology in the region*

Keywords: Consumption, Insects, Fungicides, herbicides

1. Introduction

The success of planning in India rests critically on increasing production in the agricultural sector. The scope for further extension in cultivable land having nearly been exhausted any further increase in agricultural production has to emanate from improving the productivity of agricultural sector. The Extension of area under the high yielding varieties of crops has empty demonstrated that their higher yield potential can be realized only if a adequate plant protection measures are adopted (1)

The pesticides are generally used by farmers for many improved varieties ranging from food grains to many commercial and horticultural crops. They cannot be afforded by small farmers and especially farmers in dry farming areas where income level of farmers is insignificant. However, there is regional disparity in the distribution of these pesticides. In view of this, the study of spatial variations in the consumption of pesticide has been attempted. Besides this an efforts have also been made here to examine the use of pesticides for grapevine cultivation. It is because grape vine cultivation. It is because grapevine cultivation absorbs greater quantity of pesticides.

It includes, apart from legislative controls, the use of chemical pesticides in the post world war period, quick and easy method of plant protection become available to the farmers. Chemical measures gained importance thereafter as the principal method of pest control in agriculture. The term pesticide encompasses all chemical material used for controlling of pests. Based on their principal usages, pesticide may be classified as insecticides which control

insects, fungicides which kill pathogens causing diseases to the plant rodent cider to kill rodent's weedicides or herbicides to control unwanted plants and nematicides to control, nematodes.

2. Problem

The present Research paper is examined Pesticide Consumption in western Maharashtra

3. Data Base & Methodology

In this present analysis, both primary as well as secondary data have been used. The primary data have been generated from sample villages. The selection of sample village is based on random sampling method and accordingly to zone in which consumption of pesticides are high. Further the farm level study is attempted for that randomly and purposefully selected farm to collect primary data through schedule method. The secondary data obtained from records maintained by Zilla Parishad and Agriculture Department of Solapur, Sangli, Kolhapur, Pune, Satara districts. (2)However, some limitations have been set for data availability which has restricted the scope of study data pertaining to the consumption of pesticide per hectare for earlier period i.e. in 2015 was available. Besides it is difficult to assess crop wise consumption of pesticides because of its scattered nature. The Pesticide data were abstracted for the present analysis from the published records of Zilla Parishad and Agricultural department of Solapur, Sangli, Kolhapur, Pune, Satara districts. The data thus obtained were analyzed with the help of following

$$\text{Formula } Ipe = \frac{TP}{DP} \times 100$$

Where,

Ipe = Index of pesticide consumption

TP= Pesticide consumption in the tehsil (gm/hectare)

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DP = Pesticide consumption in the districts (Western Maharashtra) (gm/hectare)

The Region

The Western Maharashtra region is located in Maharashtra State. The Study region western Maharashtra extends between 15° 45' North to 19° 24' North latitudes and 73° 19' East to 76° 15' East longitudes. It covers an area of 57235 Sq .Km With comprise five district and 58 tehsils and population of about 23449049 ,and density 357 per sq km person as per 2011 census..Bhima and Krishna is Master river system in the region Fig No 1.1In the west the Average height 900 meters above sea level, central part of the region 600 meters height, eastern portion descends 450 to 600 meters height.

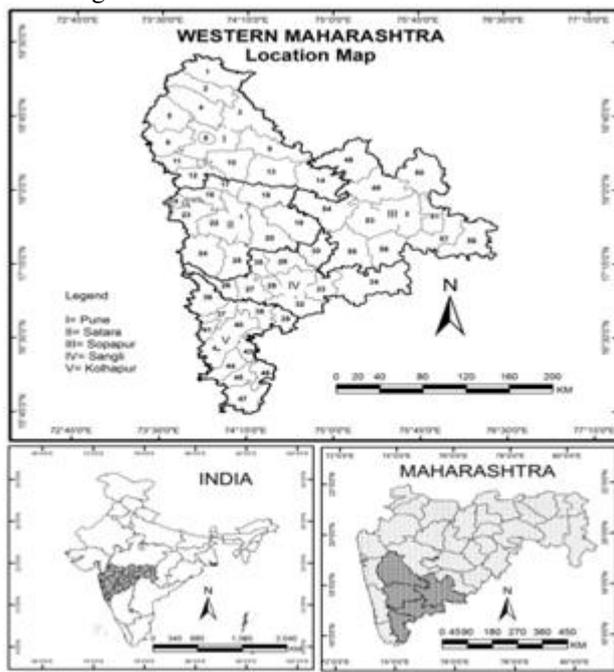


Fig. 1.1

Crop wise Use of Pesticide Technology:

The role of pesticide technology is most significant of the various agro chemical in the sense that these act as protective cover for other inputs. A crop is usually attacked by a number of pests which are often selective in the sense that they appear at different stage of growth of crop but their virulence varies widely. The loss sustained by the crop depends on the extent and virulence of pest attack. Timely and Judicious use of pesticides can save the crop from such disease in the region under study. A cursory glance at Table 1 reveals the fact that there are various pests and diseases attached to different crops grown in Solapur, Sangli, Kolhapur, Pune, Satara (tehsil) districts. Further the farmers use to control them by adopting pesticide technology as and when diseases influence the standing crop. Due to lack of tehsilwise data the picture of entire region is developed here.

As far as Jawar crop is concerned. Insect like stem border, earthed webbing and caterpillar along with grain, smut, downy mildew diseases are affecting this crop adversely every year. The farmers use indosulphon maletheon to control them.

In case of sugarcane, Pyrilla, topborer, stemborer are commonly observed which harm standing crop resulting into appreciable decrease in yields per unit area. Carboril, indosulphon dymethoet are the pesticides used by the farmers. In grape vine cultivation there are many diseases like davnimildew anthracnose, mildew and insects like herpes, mile's millbugs are taking heavy toll during leafy and flowering season. In fact, several types of pesticides are used in grapevine in the central eastern and eastern dry zones where it is located. There are also heavy doses used to control various diseases. Besides Boro mixture of lime and copper has been traditionally used as effective measures to this cash crop. (3) it is estimated that more than 80 per cent pesticides are adopted for this crop as it is delicate vine and requires the use of pesticide technology in time. Any delay in spraying pesticides may result into heavy damage of vines leading to economic loss of farmers. Generally farmers are not using pesticide technology largely to food grains. However, in view of extensive use of seed technology in the form of improved seeds, the farmers adopt pesticide technology as these varieties are susceptible easily to diseases.

4. Regional Pattern of Pesticide Consumption:

It is observed that there are some regional variations in the consumption of pesticide. The tehsils have been grouped under three categories –

1) Region of high consumption (above 30gm/hectare)

The covers the area of 13 tehsils located in central and north eastern parts of the Krishna and Panchganga river of the tahsils of Tasgaon, Kagal, Hatkanagale, Wai, Phaltan, Panhala, Karveer, Bhudargad, Bawda, Shirol, Walwa, Palus and Mahabaleshwar tehsils of western Maharashtra. The zone has been characterized by assured supply of water dominance of sugarcane, Grapevine and Soyabean Cultivation, location of Sugar factories and after all close network of village level co-operatives. Except Mahabaleshwar tehil Strawberry Fruits were cultivated. As a result this zone possesses high level of pesticide consumption.

2) Region of moderate consumption (between 15 to 30 gm/hectare)

It includes 19 tehsils of eastern, northern parts of the region, Jaoli, Daund, Radhanagri, North, Solapur, Indapur, Gadhigraj, Karmala, Miraj, Baramati, Sangola, Malshiras, Pandharpur, Velhe, Shahawadi, Ajara, Kadegaon Shirala, Karad and Khandala tehsils of western Maharashtra. The tehsils located in eastern and northern parts are endowed with the developments in irrigation mainly from wells lift and canal irrigation and presence of this region dominance of Grapevine, Pomegranate and Kardai, pulses are cultivation has attributed to the moderate level of consumption and these tehsils were developed to domestic oil mills due to the oil seeds production.

3) Region of Low Consumption (below 15 gm/hectare)

It includes 26 tehsils namely Havali, South Solapur, Akkalkot, Madha, Ambegaon, Satara, (tehsil), Mohol, Koregaon, Mangalwedha, Man, Khanapur, Mulshi, Maval, Khed, Shirur, Kavthemahankal, Chandgad, Bhore, Khatav,

Junner, Barshi, Purandhar, Atpadi, Patan, Jat and Pune city tehsils of western Maharashtra. In that tehsils frequent drought conditions meager water supply dependence on

rainfall has led to the poor economic status of farmer which has constrained the consumption of pesticide



Table 1: Crop wise Diseases and Insects and Pesticides Used to Control Them in Western Maharashtra

S.No.	Crops	Insect	Diseases	Pesticides
1	Jawar	Steam borer, earhead, webbing cuter pillar	Grain, Smut, downy, mildew	Indosulphon Maletheaon
2	Wheat	Cutwrms, blue beetle	Yellow rust	Zyaben 75, Mencozeb
3	Rice	Gundhybugs , leaf hooprs, caseworm hispa army worms	Blast, steam rot, helminthos porium	Farrest, Syperme Threen, Monocrotoyos
4	Soyabean	White fly, Jassid, semi 100 per, Girdle Beetle	Soyabean mosaic Bacterial pustules root-rot	Forret, Indosulphon, Queen holfos
5	Sugarcane	Pyrilla, topborer, stem borers	Red rot, smut	Carboril, Indosulphon, Dymethoet
6	Grape Vine	Therpse mitles millibugs	Davinimildue , Anthracnose mildew	Malthuon Bordo, Bina Pakril

Source – Zilla Parishad and Agricultural Department of Western Maharashtra Districts 2015

5. Conclusions

The role of pesticide is most significant among various agrochemicals in the sense that these act as protective umbrella for other inputs. After using other inputs such as H.Y.V. seeds, irrigation, fertilizers, machinery, etc. the crop is destroyed by pest and diseases; the entire investment is lost .(4) The farmers in Solapur, Sangli, Kolhapur, Pune, Satara districts are aware of the importance of this input in agriculture. But farmers have inadequate knowledge for using intimaie and quantity too. The pesticides are generally used by farmers for many improved varieties ranging from food grains to many commercial and horticultural crops.

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