



Trends In Consumption Of Fertilizers And Pesticides In Haryana (2000-2021)

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Abstract:

Fertilizers and pesticides are essential for enhancing agricultural productivity and their consumption are influenced by various factors such as irrigation, high-yielding seeds, credit availability, cropping patterns, and nutrient requirements. The primary objective of the study is to analyze fertilizer (NPK) and pesticides consumption trends in Haryana (2000-2021). The study emphasizes the need to ensure proper fertilizer (NPK) and pesticides distribution to improve agricultural productivity and food security in Haryana.

Key words: Agriculture, Fertilizers, Productivity, Pesticides, Nitrogen, Phosphorus, and Potash.

Introduction:

Agriculture plays a very important role in the economy of Haryana. After the introduction of Green Revolution, Indian agriculture has made remarkable progress especially Haryana has achieved remarkable growth in its agricultural sector. High yielding variety seeds, pesticides, fertilizers and irrigation are also responsible for the higher production and productivity. But Fertilizers and Pesticides have played a significant role in producing large quantity of food. Pesticides are widely used all over the world to raise agricultural production, to control pests, diseases and other plant pathogens. The present level of three nutrient components that is nitrogen, potassium and phosphate seems to be not fully balanced. The imbalance is due to problems such as all the Nitrogen being used and lowers use of Phosphates and Potash by the soil. Many states are taking measures to correct the imbalances. Fertilizer consumption is influenced by various factors. According to the Food and Agriculture Organization (FAO), the potential for fertilizer consumption is dependent on the extent of available land, actual area cultivated, amount, distribution and reliability of rainfall, area under irrigation which determines the scope for multiple cropping, availability and adoption of fertilizer-responsive seed varieties, cropping pattern which determines the quantity of nutrients needed, soil characteristics and nutrient content.

Objective:

The main objective of the study:

1. To analyze fertilizer (NPK) and pesticides consumption trends in Haryana (2000-2021).

Study Area:

The study was conducted in Haryana state. Haryana is geographically located at 30.73° N and 76.78° E; it has a very fertile land and is called the Green Land of India.

Methodology:

To meet the objective of this study, secondary data was collected from the Department of Economic and Statistical Affairs, Haryana. The collected data was analyzed by using statistical tools like CAGR (Compound annual growth rate) to draw meaningful inferences and graphical techniques.

$$\text{CAGR} = \left[\left(\frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{\frac{1}{\text{Number of Years}}} - 1 \right] \times 100$$

Result and Discussion:**Trends in fertilizer nutrients consumption in Haryana:**

The perusal of data in Table 1 shows that the consumption of fertilizer continuously increased from 930.30 thousand tonnes in 2000-2001 to 1390.31 thousand tonnes in 2020-2021. Consumption of Nitrogen (N_2O) fertilizer increased from 714.31 thousand tonnes to 1064.95 thousand tonnes. Phosphorus (P_2O_5) fertilizer consumption also increased from 206.32 thousand tonnes to 282.99 thousand tonnes and Potash (K_2O) consumption has also grown 9.67 thousand tonnes to 42.37 thousand tonnes during 2000-01 to 2020-21. As the data shown in Table 2, CAGR of fertilizer consumption in Haryana was 14.33% during 2000-01 to 2020-21 (6.66% in 2000-01 to 2005-06, 6.35% in 2005-06 to 2010-11, -0.25% in 2010-11 to 2015-16 and 1.05% in 2015-16 to 2020-21). CAGR of Nitrogen (N_2O) fertilizer consumption was 5.86% during 2000-01 to 2005-06, 4.75% during 2005-06 to 2010-11, 2.11% during 2010-11 to 2015-16 and 0.89% during 2015-16 to 2020-21. CAGR of Phosphorus (P_2O_5) fertilizer consumption was 6.97% during 2000-01 to 2005-06, 9.98% during 2005-06 to 2010-11, -4.72% during 2010-11 to 2015-16 and -0.88% during 2015-16 to 2020-21. CAGR of Potash (K_2O) fertilizer consumption was 43.66% during 2000-01 to 2005-06, 18.44% during 2005-06 to 2010-11, -25.49% during 2010-11 to 2015-16 and 29.09% during 2015-16 to 2020-21. Trends shows consumption of NPK has increased 460.01 thousand tonnes from 2001 to 2021. But compound annual growth rate (CAGR) has decreased 5.61% from 6.66% (2000-01 to 2005-06) to 1.05% (2015-16 to 2020-21).

Table: 1**Fertilizer consumption (Nutrients) in Haryana 2000 to 2021.**

Year	N	P	K	Nutrients N+P+K (IN “000 Tonnes”)
2000-01	714.31	206.32	9.67	930.30
2005-06	847.43	252.57	28.67	1128.67
2010-11	974.05	335.95	47.63	1357.63
2015-16	1037.10	290.59	19.70	1347.39
2020-21	1064.95	282.99	42.37	1390.31

Source: Statistical Abstracts of Haryana.

Table: 2**Compound annual growth rate of fertilizer consumption (Nutrients) in Haryana**

Years	N (in percentage)	P (in percentage)	K (in percentage)	N+P+K (in percentage)
2000-01 to 2020-21	14.24	11.11	63.64	14.33
2000-01 to 2005-06	5.86	6.97	43.66	6.66
2005-06 to 2010-11	4.75	9.98	18.44	6.35
2010-11 to 2015-16	2.11	-4.72	-25.49	-0.25
2015-16 to 2020-21	0.89	-0.88	29.09	1.05

Trends in Pesticides (Technical Grade) consumption in Haryana:

Table 3 shows, consumption of pesticides (Technical Grade) in Haryana during 2000 to 2021. It shows 5025 tonnes pesticides used in 2000-01 and 4200 tonnes pesticides used in 2020-21 in Haryana. It has reduced by 825 tonnes. As per Table 4, CAGR of consumption of pesticides has decreased by -5.80 % during 2000-01 to 2020-21. During 2000-01 to 2005-06 CAGR has reflected negative growth i.e. -2.55% and during 2005-06 to 2010-11 it also negative growth i.e. -4.42%, but in 2010-11 to 2015-16 it reflects positive growth i.e. 0.33% and 0.81% in 2015-16 to 2020-21.

Table: 3**Consumption of pesticides (Technical Grade) in Haryana 2000 to 2021**

Year	Quantity (In Tonnes)	Area Covered (000 Ha.)
2000-01	5,025.00	8798
2005-06	4,650.00	8495
2010-11	4,060.00	7,110
2015-16	4,100.00	7,110
2020-21	4,200.00	7,100

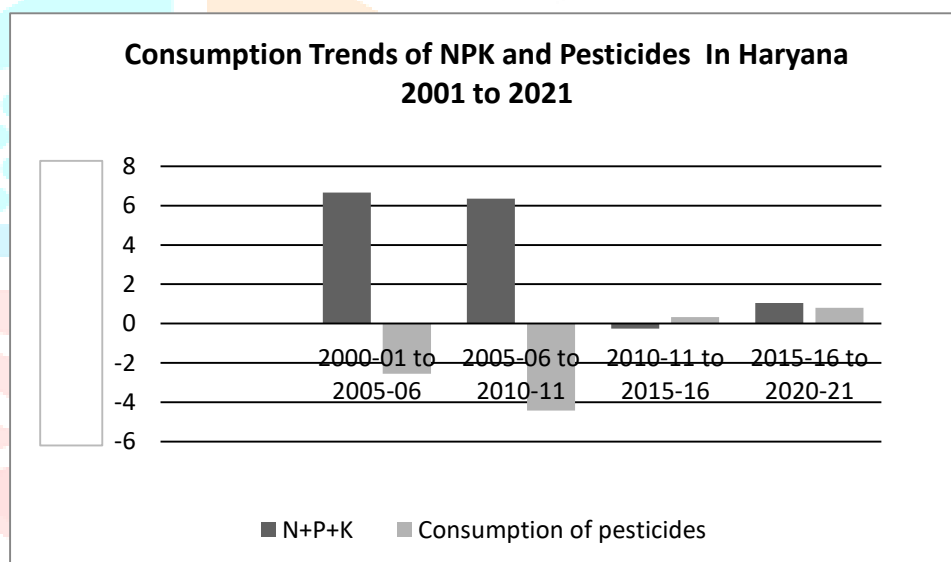
Source: Statistical Abstracts of Haryana.

Table: 4

Compound annual growth rate of consumption of pesticides (Technical Grade) in Haryana 2000 to 2021

Years	Pesticides (in percentage)
2000-01 to 2020-21	-5.80
2000-01 to 2005-06	-2.55
2005-06 to 2010-11	-4.42
2010-11 to 2015-16	0.33
2015-16 to 2020-21	0.81

Figure 1 shows consumption trends of NPK and Pesticides in Haryana during 2001 to 2021 as Table 5 reflects CAGR data of NPK consumption and Pesticides consumption during 2000-01 to 2020-21. It shows that during study period consumption of NPK CAGR was positively grown with the rate of 14.33 percent but consumption of Pesticides CAGR negatively grown with the rate of -5.80 percent.

**Figure: 1**

In the study period of 2000-01 to 2005-06 consumption of NPK CAGR positively grown with 6.66 percent and consumption of pesticides CAGR negatively grown with -2.55 percent. During the 2005-06 to 2010-11 consumption of NPK CAGR positively grown with 6.35 percent and consumption of pesticides CAGR negatively grown with -4.42 percent. But between the periods of 2010-11 to 2015-16 consumption of NPK CAGR negatively grown with -0.25 percent and consumption of pesticides CAGR positively grown with 0.33 percent. In 2015-16 NPK consumption CAGR and pesticides consumption CAGR both reflect positive trend i.e. 1.05 and 0.81 percent growth.

Table: 5

NPK (Nutrients) and Pesticides (Technical Grade) consumption Growth in Haryana 2000 to 2021

Years	N+P+K (CAGR in %)	Pesticides (CAGR in %)
2000-01 to 2020-21	14.33	-5.80
2000-01 to 2005-06	6.66	-2.55
2005-06 to 2010-11	6.35	-4.42
2010-11 to 2015-16	-0.25	0.33
2015-16 to 2020-21	1.05	0.81

Conclusion:

Fertilizers and pesticides consumption can be influenced by many elements like irrigation facilities, high-yield variety seeds, farmer's economic situation, etc. Chemical fertilizers are more effective on high-yielding cultivars. Nitrogen, phosphorus, and potassium (NPK) are the three most important elements that must be given to the soil in the form of Fertilizers. Our resources, such as land and water, are in serious crisis. In the future, fertilizers will play an important role in the growing of agricultural production. This paper shows that during the study period, growth of NPK consumption is decreasing, but from 2015-16 to 2020-21, it again starts increasing with a high amount of Consumption in Haryana, as well as the consumption of pesticides growth rate was also decreasing from 2000-01 to 2010-11, but from 2010-11 to 2020-21, trends show that it has started increasing. The price of fertilizers and pesticides can significantly influence consumption; higher prices can lead to reduced usage. The affordability also plays an important role in the farmer's decision-making process regarding fertilizers and pesticides utilization. Wheat and rice are the main crops that affect the fertilizers and pesticides consumption. This means fertilizers and pesticides consumption is also affected by the area under wheat or rice cultivation.

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