
The Trends in consumption of NPK and Production of Food grains in Haryana

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Abstract

Fertilize and pesticides play a vital role in the modern agriculture. Use of fertilizer in agriculture is as old as agriculture it's self. Fertilizers are the main variable deciding the cost and the quality of the production. With the innovation in agriculture sector NPK become a great substitute of traditional fertilizers. In present research study an attempt has been made to examine the trends and correlation of NPK and productivity. The study is based on secondary data collected from different sources. Study concludes that ratio of NPK was not according to the ideal standard in 1966-67 and not even in 2014-15. The growth of use of NPK remained high as compared to area and production which indicates that per hectare consumption of NPK increased. Further a more strong correlation has been found between use of NPK and productivity as comparison to use of pesticides and productivity.

KEY WORDS- Fertilizers, Pesticides, Production, Area, Agriculture

INTRODUCTION

An agriculture input plays an important role in production cost. The main agriculture inputs are seeds, machinery, irrigation facilities and fertilizers. In present scenario uses of fertilizers and pesticides and their quality is becoming an exclusive issue among different policy makers and environment scientist. In India this situation became more challenging for our economist as the supply of main fertilizers (NPK) is highly dependent on our imports which increase the foreign liabilities.

Fertilizers and pesticides play a vital role in the modern agriculture. Use of fertilizer in agriculture is as old as agriculture it's self. It has changed their form with the changes in demand of output and innovation of new technology from ancient time to mid 20th centuries as in ancient time mainly the natural fertilizers were used by farmers. These fertilizers were prepared by farmers with the help of raw natural material or different kind of wastage at their farm level. Dung secured highest position among traditional fertilizer commonly used by farmer in India.

With the innovation in agricultures sector NPK became a great substitute of traditional fertilizers.

NPK is the comprised form of the Nitrogen (N), Phosphorus (P) and Potassium (K), these are the macronutrients considered as most required nutrients for plant's growth and increase in the fertility of soil. Where Nitrogen is needed to make plants strong, Phosphorus helps in the growth of roots and flowers and Potassium is needed for the overall growth of plants. The ideal ratio of NPK for India is considered at 4:2:1. But the NPK ratio in the country has reached up to 6.5:2.9:1 in 2011-2012 as stated by the fertilizer association of India (FAI).

On the other hand, pesticides are the chemical solution used to solve the problems of insecticide, fungicides and moluscides faced by a plant. Usually the pesticides are also included in the category of fertilizers, but on the basis of their impact on soil and plants they belong to a separate category. In India the BHU plant near Calcutta started production of pesticides in 1952. At present India scores second position in production of pesticides after china. Although the uses of pesticides always remain controversial due to its unwanted and negative effects on our soil, water and spices including human being. But this fact does not reduce the

importance of use of pesticides in agriculture production.

The role and trends in use of fertilizers and pesticides have been studied by many authors and scholars from time to time. **Jaga and Patel (2012)** examined the consumption of fertilizers in India. The main objective of the study was to examine the growth pattern of fertilizers. The study was based on secondary data. The study revealed that the fertilizer consumption in the country increased from 65.6 thousand tonnes in 1951-52 to 2649 million tonnes in 2009-10. One the other end, the per hectare consumption of fertilizers increased from less than one kg in 1951-52 to 135 kg in 2009-10. **Sharma and Thaker (2011)** have highlighted the determinants of fertilizer consumption in their study. Secondary sources of data have been used for the study. The study revealed that the area under high yielding varieties, gross irrigated area, fertilizer price, procurement price of wheat and rice (as these are the main users of fertilizers) and credit facilities were the main determinants of fertilizer consumption. The researchers also revealed that the demand for fertilizers would be about 41 million tonnes by the year 2020. **Chakrabarty A. (2014)** highlighted the use of pesticides and fertilizers for crop production in Tangli district of Bangladesh. The study was based on primary

and secondary data. The study concludes that for increasing the production farmers are fully dependent on fertilizers and pesticides. Besides this, the study concludes that most of the farmers were not aware about the proper use of these chemicals. **Majumdar, K. (2015)** has examined the impact of bio fertilizers on Indian agriculture. The study was based on secondary data. Researcher revealed that bio fertilizers have the potential for sustainable agriculture across the country. But there was inequality in use of bio fertilizers. The Study suggested that there is need to examine proper production and distribution of fertilizers.

The present research work is an attempt in this direction and examines the trends, and correlation of fertilizers, pesticides, area and production of food grains in Haryana. Following are the objectives of present research paper-

- I) To examine the trends in uses of NPK and pesticides, and production of food grains in Haryana

- II) To examine the correlation between use of NPK, pesticides and production of fertilizers.

Research Methodology-

The study is based on secondary data collected from various published and unpublished sources. Data regarding use of pesticides, fertilizers and production have been taken from Statistical abstract of Haryana. Data on the use and ratio of NPK has been collect from the official website of Agriculture ministry of India. Statistical tools like mean, SD, CV, pearson's correlation and CAGR (compound annual growth rate) have been used.

Result discussion

- A) This section of the paper discusses about the trends of NPK, pesticides, area and production since 1966-67.

Table 1.1
Trends of NPK, Pesticides, Area and production

year	N	p	K	total NPK	Pesticidies	Area	production
1966-67	12626	574	147	13347	273	192	223
1970-71	60,972	6860	2228	70060	412	269.2	460
1980-81	187385	31340	12098	230823	2150	483.9	1259
1985-86	296394	69639	6154	372187	3608.26	584	1633
1990-91	443245	138004	5042	586292	5164.53	661.2	1834
1995-96	587045	133582	3160	723787	5100	830	1847

2000-01	714308	206319	9668	930295	5025	1054.3	2695
2005-06	847427	252570	28674	1128671	4650	1046.6	3194
2010-11	974045	335950	47627	1357622	4060	1243.3	3465
2014-15	1013267	254437	36199	1303903	4070	1277	4007
CAGR	9.36%	5.19%	11.89%	9.80%	5.67%	3.94%	6.07%

Source- Statistical Abstract of Haryana 2015-16

Figures of NPK and pesticides are in Tonnes

Figures of Production are in 000 Tonnes

Figures of Area are in 000 Hectares

Table 1.1 explains the trends and CAGR of V of NPK, pesticides, area and production. Table shows that the consumption of NPK in 1966-67 was of 12626, 574 and 147 tonnes, respectively, where the consumption of pesticides was 274 tonnes. Area under cultivation was 192000 hectares and the production was 223000 tonnes at the time of inception of Haryana. The ratio of NPK was 9.5:4:1 at that time which was far away from the ideal ratio (4:2:1) as suggested by FCI of India.

Table future indicates the same aggregates for the year of 2014-15. Table shows that the consumption on NPK was 1013267, 254437 and 36199 tonnes, respectively, where the consumption of pesticides was 4070 tonnes. Area under cultivation was 1277000 hectares and the production was 4007000 tonnes. The ratio of NPK was 7.8:1.9:2 in 2014-15 which was far away from the ideal ratio as suggested

by FCI of India. Table future shows the CAGR (Compound annual growth rate). The CAGR was higher in case of NPK followed by production, pesticides and area. In NPK Potassium (K) growth was higher and the lower growth rate was found in case of area.

The results of the table 1.1 conclude that the ratio of NPK was not according the ideal stand in 1966-67 and not even in 2014-15. The results also indicate that there were some reforms in the ratio in 2014-15 as compare to the results in 1966-67. The growth rate was higher in NPK as compared to area and production which indicates that per hectare consumption of NPK increased. The growth rate of production was higher than the area which shows that per capita productivity also increased. We can conclude that there has been a positive relation between consumption of NPK and production.

Table 1.2
Descriptive Statistics

	N	Mean	Std. Deviation
N	10	513671.4000	370163.10923
P	10	142927.5000	116640.68821
K	10	15099.7000	16462.02399
TotalnPK	10	671698.7000	498369.67567
Pact	10	3451.2790	1867.17377
Area	10	764.1500	387.98983
Producton	10	2061.7000	1260.90488
Valid N (listwise)	10		

Table 1.2 shows the descriptive statistics of variables. Table shows that SD values of NPK were higher followed by production area and pesticides. Mean value of the NPK variables was also high followed by pesticides production and area.

B) This section of the research paper highlights the correlation between NPK, pesticides, area and production.

Table 1.3
Correlation between NPK, Pesticides, Area and Production

		Correlations						
		N	P	K	totalnPK	pact	area	producton
Pactoids	Pearson	.750*	.711*	.335	.734*	1	.766**	.725*
	Correlation							
	Sig. (2-tailed)	.013	.021	.343	.016		.010	.018

Area	Pearson Correlation	.992**	.963**	.805**	.989**	.766**	1	.983**
	Sig. (2-tailed)	.000	.000	.005	.000	.010		.000
production	Pearson Correlation	.982**	.949**	.845**	.979**	.725*	.983**	1
	Sig. (2-tailed)	.000	.000	.002	.000	.018	.000	
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source- Statistical Abstract of Haryana 2015-16

Table 1.3 shows the correlation between NPK, pesticides, area and production. Table shows that production and area was highly correlated with NPK. In case of pesticides table shows that the pesticides were also highly correlated with area, NPK and production. We can conclude that if NPK and pesticide are considered, the degree of correlation was higher in case of NPK as compare to pesticides with area and production. It indicates that NPK was more correlated to production as compare to pesticides. Among all variables area and production was highly correlated than other variables.

Concluding Remarks- Study concludes that the ratio of NPK was not according the ideal stand in 1966-67 and not even in 2014-15. The results also indicate there were some reforms in the

ratio in 2014-15 as compared to the results in 1966-67. The growth rate was higher in NPK as compare to area and production which indicates that per hectare consumption of NPK increased. The growth rate of production was higher than area that shows that per capita productivity also increased. We can conclude that there is a positive relation between consumption of NPK and production.

In case of correlation study concludes that NPK was more correlated to production as compare to pesticides. Future we can concludes that in case of NPK and pesticide the degree of correlation was high in case of NPK as compare to pesticides with area and production

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