

Some Findings from Yield Estimation Survey of Wheat Crop for the Year Rabi 2002-2003, District Faisalabad

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Abstract: This field study was conducted in District Faisalabad during the year Rabi 2002-03, to determine the factors Sowing period, effect of seed rate on yield, use of fertilizers, number of irrigations, effect of spray on yield, effects of soil type on wheat yield. The effect of sowing period is significant. Highly significant difference, the effect of seed rate, use of fertilizers and number of irrigations on the yield of wheat crop. Effect of spray and effects of soil type on wheat yield is highly significant.

Key words: Sowing period, seed rate, fertilizer, irrigation, spray, soil

INTRODUCTION

Wheat (*Triticum aestivum* L.) is grown in Pakistan on an area of 8009 thousands hectares with annual production of 19235 thousands tonnes average yield is 2384 kg ha⁻¹ [1].

Wheat yield per acre is far below as compare to other countries. Among the various yield determining factors. Sowing period, effect of seed rate on yield, use of fertilizers, number of irrigations, effect of spray on yield and effects of soil type on wheat yield are of primary importance. The role of fertilizer is well recognized because there are easy to handle and product quick results. Sachan *et al.* [2] found for wheat cv. Hira grown with fertilizer treatment 0,50,100,150 and 200 kg that yield increased with the application of fertilizer.

This study shows that wheat treated with four irrigation gives maximum yield. Thakur *et al.* [3] found that wheat treated four irrigations at the crown-root-initiation, maximum tillering, root and milk stages recorded the highest grain.

Wheat yield can be increased either by bringing more area under cultivation or by increasing its yield per unit area. In prevailing situation the only alternatives is to increase wheat production in country by obtaining higher yield per acre by different combination of Sowing period, effect of seed rate on yield, use of fertilizers, number of irrigations, effect of spray on yield and effects of soil type on wheat yield. Hegde [4] conducted experiment that there was a declining trend in the yield of rice and wheat crop in different soil types due to general decline in soil fertility.

Pandey *et al.* [5] found that the seed rate of 150 kg ha⁻¹ increased the yield. Further increase in seed rate failed to produce any significant effect on these parameters.

Treatment with 100% of the recommended rate of fertilizers significantly increased all yield attributing indices grain yield, straw yield and protein content in grain.

The present research was undertaken to determine the effect of sowing period, use of fertilizer and number of irrigation etc. at farmers level under agro-ecological conditions of Faisalabad.

MATERIALS AND METHODS

The present study was conducted to investigate various relationships between wheat crop production, on the basis of yield estimation survey for the year Rabi 2002-03. To investigate the relationships between wheat crop production and other factors were studied which are as under:

Sowing period: There are three levels of sowing period i.e. early, mid and late.

Seed rate: There are different levels of seed rate i.e. 40 kg/acre, 45 kg/acre, 50 kg per acre and 60 kg/acre.

Use of fertilizer: There are five levels of fertilizer that the farmers used i.e. 50, 75, 100, 150 and 200 kg per acre.

Number of irrigation: There are five levels of irrigation.

Sprays: The farmers use the spray or not on the wheat crop.

Soil: There are four types of soil:

1. Kolarathee
2. Raintlee
3. Chiknee
4. Maira

This study relates to district Faisalabad which contains three tehsils. These are 820 total number of villages in district Faisalabad. I selected 45 villages with systematic random sampling technique from the total number of villages in each tehsil. Three wheat growers were selected from each village by using simple random sampling techniques and thus the sample of this study consisted of 135 respondents then the data was collected from each of the selected growers in their selected villages. Some important variables has been taken for the purpose of study on yield of wheat crop which were recorded. The collected data was analyzed by applying statistical techniques:

- i) Step wise regression
- ii) Multiple regression
- iii) Simple regression
- iv) Mean and standard deviation to determine the comparisons between the variables and standard error.

RESULTS AND DISCUSSION

Sowing period: Table 1 relates to yield and sowing time, there are three sowing time, i.e. Early, Mid and Late. Early sowing time is 20th October to 15th November, Mid sowing time is 15th November to 30th November, Late sowing time is 1st December to onward. The Data reveals that there is significant effects of sowing time on the yield of wheat crop. These findings support the conclusion of other scientists. Tiwari *et al.*^[6] sowing wheat on the Fourth week of November proved significantly better than the earlier or late sowing dates.

Seed rate: The equation No. 1 indicated that the Regression equation of seed rate which is obtained to estimate the yield of wheat crop at different levels of these factor. This equation has highly significant estimated regression.

This indicates that the seed rate/acre has highly significant on the yield of wheat crop in farmers field. Similar findings are also reported by Thakur *et al.*^[7]. Seed rate at 200 kg ha⁻¹ recorded significantly higher grain and straw yields than 150 and 100 kg seeds ha⁻¹. Tripathi and Chauhan^[8]. The regression equation is given below:

$$Y = 14.80 + 0.37X^{**} \quad ** \text{ means significant at } p < 0.01$$

(5.60) (0.12)

Where:

Y = Yield/acre

X = Seed rate/acre

The values in parentheses () are standard errors.

Table 1: Effect of sowing period on the yield of wheat crop

| Sowing period | Cases | Mean | S.E. |
|---------------|-------|-------|------|
| Early | 13 | 32.57 | 3.85 |
| Mid | 104 | 33.17 | 0.76 |
| Late | 18 | 26.37 | 2.52 |

Table 2: Varietal Comparisons among Farmer's fields.

| Variety | Cases | Mean | S.E. |
|---------|-------|---------|------|
| Inqlab | 55 | 31.6713 | 1.39 |
| Watan | 54 | 32.3530 | 1.12 |
| Aqqab | 6 | 37.8917 | 1.75 |
| Iqbal | 4 | 36.0425 | 2.20 |
| Pak-81 | 8 | 25.2487 | 2.87 |
| Pasban | 2 | 35.8400 | 5.81 |
| Punjab | 3 | 40.1500 | 0.73 |
| Misc | 3 | 31.0733 | 5.66 |
| OVERALL | 135 | 32.2062 | 0.77 |

Table 3: Source of seed

| | Case | Mean | S.D. |
|-------------|------|---------|--------|
| Home | 134 | 32.1257 | 9.0995 |
| Corporation | 1 | 42.9900 | 0.000 |

Table 4: Mean and S.E. of irrigation on wheat yield

| Value label | Cases | Mean | S.E. |
|---------------------|-------|---------|------|
| 1 | 3 | 20.00 | 8.07 |
| 2. | 10 | 27.55 | 3.98 |
| 3. | 42 | 29.45 | 0.29 |
| 4. | 54 | 34.3381 | 1.14 |
| 5. | 25 | 35.4250 | 1.54 |
| Within groups total | 135 | 32.2062 | 0.74 |

Table 5: Effects of spray on wheat yield

| Value lable | Cases | Mean | ±S.E. |
|-------------|-------|-------|-------|
| No. | 98 | 30.45 | 0.94 |
| Yes | 37 | 36.85 | 1.08 |
| Total | 135 | 32.20 | 0.34 |

Table 6: Effects of soil on wheat yield

| Value label | Cases | Mean | ±S.E. |
|---------------------|-------|---------|-------|
| Kolarathee | 12 | 22.5092 | 2.74 |
| Raintlee | 24 | 33.0577 | 1.38 |
| Chiknee | 95 | 33.0838 | 0.92 |
| Maira | 4 | 35.3475 | 4.65 |
| Within groups Total | 135 | 32.2062 | 0.74 |

Use of fertilizer: The equation No. 2 depicts regression equation of fertilizer which is obtained the yield of wheat crop at fertilizer used per acre of this factor. This equation has highly significant.

This means that the use of fertilizer per acre has significant effect on the yield of wheat crop in farmers fields. These results agree with Tripathi and Chauhan^[8]. The application of fertilizers recorded significantly higher grain yield. Multiple regression equation No. 2 is given below:

$$Y = 24.95 + 0.062 X^{**} \quad ** \text{ means significant at } p < 0.01$$

(1.76) (0.01)

Where:

Y = Yield/acre

X = Fertilizer/acre

The values in parentheses () are standard errors.

The data (Table 2) indicated that the varietal comparisons among farmers fields. The data shows that there is a significant difference between the varieties. It means that different varieties gave different results.

Table 3 relates to source of seed, there is two source of seed, home and corporation. The data indicates that there is a significant difference between the home seed and corporation, so the corporation seed is better than home seed. It gives more better results than the others.

Number of irrigation: Table 4 shows that yield of wheat and number of irrigation, the data indicates that there is significant difference between the number of irrigation on yield of wheat, the yield effects due to number of irrigation.

Similar results have been already reported by Hati *et al.*^[9] the grain yield increased significantly with the increase in irrigation level.

Impact of fertilizer and irrigation on yield: The equation No. 3 revealed the Multiple Regression of fertilizer and irrigation on the yield of wheat crop for the year Rabi 2002-03. This regression equation has been derived to estimate the yield for different levels of these factors. This equation has highly significant estimated regression. This indicates that the use of fertilizer and number of irrigation have significant effect on the yield of wheat crop in farmer's fields. However, the lower value of adjusted R² indicates high variation from one field to another may be because of variation in soil or individual behaviour. The regression equation No. 3 is given below:

$$Y = 18.03 + 0.05 X_1 + 2.38X_2 \quad ** \quad ** \text{ means significant at } P < 0.01$$

(2.92) (0.014) (0.81) R² adjusted = 0.17

Where:

Y = Yield/acre

X₁ = Use of fertilizer

X₂ = Number of irrigation

The values in parentheses () are standard errors.

Effects of sprays: Table 5 shows that the use of spray on the wheat crop has highly significant effects on the yield of wheat crops.

The data reveals that there is significant difference between the use of spray and unspray. It means that sprayed crop gives more better results than unsprayed.

Soil effect: Table 6 studies the effect of kinds of soil on wheat yield, there are four types of soil, 1-kolarathee 2. Raintlee 3. Chiknee 4. Maira.

The data shows a highly significant effect of kinds of soil on the yield of wheat crop. It means that type of soil effects on the yield significantly and soil type gave different yield.

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