



Effect of new rice strains on rice production and reclaiming the barren uncultivated lands of Bahawalnagar

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Abstract

A field trial was conducted for two years 2015-2016, at Rice Research Station Bahawalnagar to screen out the potential of new high yielding paddy strains. 8 candidate strains were tested, first grown in nurseries then transplanted in a plot size of 4.5 x 8.25 ft. in last week of June. Recommended dose of N, P, K, Zn was applied. Lay out of the experiment was RCBD with three repeats. Physical parameters such as Days to 50 % flowering, Final plant height (cm). No of tillers per plant, Panicle length (cm), No of grains per panicle, 1000 grain weight (gm.) and yield data in kgs per plot were recorded. It was revealed from the recorded data recorded that the strain PK- 8649 gave maximum yield 5797Kgs per hectare, 143 no of grains per panicles; 23.23gm thousands grain wt and 18 no of tillers per plant which is more than the already approved variety PS-2. Based on these observations, this can easily be concluded that the strain PK-8649 may be considered as advance line of high yield potential under Bahawalnagar conditions. Moreover after rice harvesting soil analysis report shows considerable improvement in soil pH, Ec and organic matter.

Keywords: yield, paddy, flowering, panicle, strain

Introduction

Rice is the second largest staple food crop of Pakistan and is also an important exportable item. Rice is the second most cultivated cereal after wheat. It provides 20% of the per capita energy, and 13% of the protein consumed worldwide (Juliano, 1994) [3]. It accounts for 3.2 percent in the value added in agriculture and 0.7 percent of GDP. Rice was grown on an area of 2891 thousands hectare which produce 7005 thousands tones showing a growth of 3.0% over corresponding period of the last year's production which gave 6798 thousands tones. Rice (*Oryza sativa* L.) is an important staple food of more than half of the world population. It is dominantly produced and consumed in the Asia (Singh *et al.*, 2000) [5]. Under normal condition, rice growing on these soils performs poorly due Al³⁺, Fe²⁺ or H⁺ stress (Shamshuddin *et al.*, 2013, 2014) [6]. In upland cropping systems of subsistence farmers, input levels are generally low, and low yield is common due to poor soil fertility and weed competition (Rodenburg *et al.*, 2009) [4]. Organic acids released by rice roots under stress may play a major role in the Al³⁺ and Fe²⁺ tolerance mechanisms (Gerke *et al.*, 1994) [2]. Increasing rice productivity and production is essential to ensure national food security, reduce poverty, and safeguard against volatility of the rice market (Pandey *et al.*, 2012) [7].

A large rice area is still under traditional varieties where in absolute terms, HYV (high yielding variety) yield levels have been much higher than the traditional types. Rice production increased due to more area brought under cultivation, timely application of water, fertilizer, pesticide and sowing of high yielding rice varieties. Huge efforts on the part of research work and the Government, its production has not been increased according to the genetic potential of varieties. Average yield of fine grain rice varieties is much below than

its production potential. There are number of factors contributing to this yield gap (Ahmad, 1992) [1]. The rate of population growth and the level of rice consumption are still relatively high, demanding continuous production enhancement efforts from the state. Rice wheat cropping system is highly nutrient exhaustive and therefore, its continuous use has depleted inherent soil fertility, causing deficiency of several nutrients (Zia *et al.* 1997). The limiting factors which lowers rice yield can easily be minimized by growing new rice varieties. The result of this study will provide information to the farming community for sowing of new rice varieties.

Material and methods

The study was conducted at Rice Research Station Bahawalnagar during 2015-16. The experiment was laid out in randomized complete block design with three repeats. Eight new strains were tested in the trial, first sown in the nursery then transplanted in the field with a plot size of 4.5x8.25 ft. Recommended dose of NPK and Zn was applied. Data regarding 50% flowering, final plant height (cm), No of tillers per plant, Panicle length (cm), No of grains per panicle, Thousands grain wt (gm) and yield data kgs per hectare were recorded. Soil analysis before sowing of experiment and after harvesting of experiment was performed.

Result and discussions

The data revealed that maximum paddy yield (5797 kgs per hectare), panicle length (28.4 cm), no of grains per panicle (143) and thousands grain wt (23.23) was recorded in new strain

Pk-8649. The already approved variety PS-2 produced 3307 kgs/ha yield, 27.6mm panicle length, 116 no of grains per

panicle and 21.2gm thousand grain wt. Maximum plant height (Cm) was recorded in the strain (Cemb 1-6-3) while lowest plant height 112 cm was recorded in PS-2. Maximum no of tillers per plant 24 was recorded in strain 1/3/98 while lowest no of tillers 17 was recorded in PS-2.

Grain length (mm)

Maximum grain length 12.7mm was recorded in the strain PK-8649 while the lowest grain length was recorded in Bas-2000 with 10.08 mm.

Panicle length (cm)

Maximum panicle length was recorded in the strain PK-8649

with 28.4 cm while the lowest panicle length was recorded in Bas-515 with 25.1 cm.

No of grains per panicle

Maximum no of grains per panicle (143) was recorded in the strain PK-8649 while the lowest No of grains per panicle (105) was recorded in the strain Cemb 1-6-3.

Yield in KGS per hectare

Maximum yield in kgs per hectare was recorded in the strain PK-8649 with 5797 while the lowest yield in kgs per hectare (2667) was recorded in Cemb 1-6-3.

Table 1: Effect of New Rice Strains on Rice Production

Strains	Grain length mm	Days to 50% flowering	Plant height cm	No of tillers per plant	Panicle length cm	No of grains /panicle	Thousand grain wt gms	Yield Kgs/ha
1/3/83 B	12.1	58	125	23	27.4	123	22.1	4579
1/3/83 c	12.6	63	120	21	28.3	137	21.9	4985
1/3/98	12.1	68	114	24	26.9	122	20.44	4289
Bas-515	11.3	65	113	19	25.1	113	21.13	3709
Bas-2000	10.08	75	134	20	28.3	114	21.2	4348
Cemb 1-6-3	12.6	75	143	22	27.3	105	22.1	2667
PK-8649	12.7	76	133	18	28.4	143	23.23	5797
PS-2	12.4	71	112	17	27.6	116	21.2	3307

LSD 778.12 CV=11.23

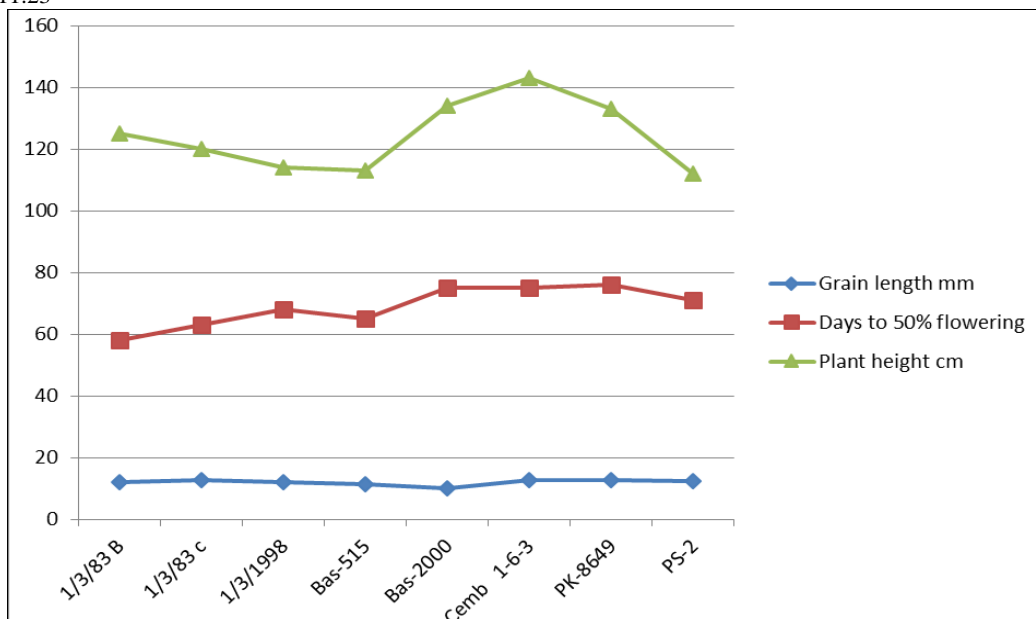


Fig 1

Table -1 shows that maximum yield thousand grain wt, no of grains per panicle, panicle length was obtained in new strain PK-8649 and was far better than the standard variety PS-2.

Table 2: Soil analysis report before sowing and after harvesting of rice crop.

Parameter	Values before rice sowing	Values after rice harvesting
pH	8.7	8.5
EC	3.6	3.2
Organic matter	0.96	1.08

It is revealed from the above data that after rice harvesting the pH, EC and organic matter of the soil improves considerably. So it can also be recommended that sowing of rice crop improves soil health.

Conclusion

It was concluded from the trial results that the strain PK-8649 gave maximum yield results, no of grains per panicle, panicle length, thousand grain wt than the other varieties included in the trial.

This can easily be concluded that the strain Pk-8649 may be

considered as advance line of high yield potential. Moreover soil analysis report after rice harvesting the pH, EC and organic matter of the soil improves considerably. So it can also be recommended that sowing of rice crop improves soil health.

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