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Effect of varietal performance on growth and yield of rice

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Abstract

An experiment was conducted with nine treatment combinations comprised of three date of transplanting and three varieties in split plot design. Three date of transplanting viz. 15 July, 25 July, and 5 August were kept in main plot and three varieties viz. Sarju 52 NDR-359 and Swarna were kept in sub plots. The experiment was replicated four times. The 40 kg seed are used for nursery raising. Crop was fertilized with recommended dose of fertilizer of 120 kg N 60 kg P₂O₅ and 60 kg K₂O. The variety Swarna was found suitable for rice cultivation as to harvest the higher yield.

Keywords: Transplanting, fertilizer, split, cultivation

Introduction

Rice (*Oryza sativa* L.) is one of the most important food grain crops of more than 60 percent of the world's population. About 90 percent of all rice grown in the world is produced and consumed in the Asian region. It is the world's leading food crop in terms of area and production. Among the rice growing countries, India has the largest area followed by China and Indonesia. India ranks second in production after China. Andhra Pradesh, Bihar, Uttar Pradesh, Madhya Pradesh and West Bengal are leading states in the area of rice. In India, it is grown over an area of 43.79 million hectares having production of 112.91 million tonnes with average productivity of 2578 kg ha⁻¹. In Uttar Pradesh, it is grown on 5.95 million hectares area with production of 13.27 million tonnes and productivity of 2230 kg ha⁻¹ (Anonymous 2018).

Materials and Methods

The experiment was conducted during *Kharif* 2015 at Agromet Research Farm of Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh India. The field was well levelled having good soil condition. Geographically, Faizabad (Kumarganj) falls in subtropical climate and is situated at 26^o.47' North latitude, 82^o12' East longitude with an altitude of 113 meters above mean sea level. The experimental site is situated in main campus of University on Faizabad- Raibarelli road at the distance of 42 km from Faizabad district headquarter.

Summary and Conclusion

Plant height was influenced by varieties was at all the stages of crops of the crop. Significantly higher plant height was recorded where NDR-359 was given & it remained at par with sarju-52. Finally, it resulted in to growth of plant faster as compared to other treatments tested during the course of investigation. The lowest plant height was recorded with Swarna at all growth stages.

Varieties had significantly effect on number of tillers/hill and leaf area index. The significantly higher number of tiller/hill and leaf area index was recorded with NDR-359 which was at par with Swarna as compared to rest of the treatment. It is mainly due to late maturity varieties to obtain longer period for vegetative and reproductive growth. The lower number of tillers and LAI was recorded under Sarju-52 at all the growth stages.

Varieties had significantly effect on the dry matter accumulation at all the growth stages 30, 60, 90 and harvest stages, Higher dry matter accumulation was recorded under Swarna which was at par with treatment NDR-359 as compared to rest of treatment. This might be due to the long duration varieties provide proper time for increased plant height, produced more number of shoot and leaf area index. Lower dry matter accumulation was recorded under treatment sarju-52 at all growth stages.

The yield attributes viz; number of effective tiller/hill, length of panicle, and number of grains/panicle were influenced significantly due to varieties. However, significantly higher

value of these yield attributes were recorded with the Swarna which was at par with NDR-359. Grain and straw yield were affected significantly due to various varieties. Significantly higher grain and straw yield of rice were obtained with the Swarna which was at par with NDR-359 as compared to rest of treatments. This might be due to increased yield attributes viz-number of effective tillers, length of panicle, number of grains/panicle, weight of grain/panicle which resulted in higher yield. The long duration and suitable varieties which contributed to increased dry matter production. Lowest grain and straw yield were recorded with Sarju-52.

Table 1: Yield attributes and yield of rice as affected by different date of transplanting and varieties

Treatment	No. of effective tillers/m ²	Length of panicle (cm)	No. of grains/panicle	Test weight (g)	Grain yield (q/ha)	Straw yield (q/ha)	Harvest index (%)
Date of transplanting							
15 July	436.5	10.4	167.3	26.6	48.7	72.7	40.1
25 July	410.4	9.8	155.6	25.2	46.1	69.2	40.0
5 August	368.0	9.5	141.9	24.9	40.4	63.8	39.9
S.Em±	12.08	0.23	4.47	0.04	1.35	1.75	
C.D. at 5%	38.08	0.72	14.09	NS	4.28	5.53	
Varieties							
Sarju-52	376.36	7.25	147.6	24.47	43.7	64.28	39.98
NDR-359	409.90	9.93	154.3	25.17	44.9	67.02	39.99
Swarna	418.74	10.63	163.9	26.10	48.5	74.45	40.01
S.Em±	8.45	0.19	3.07	0.09	0.90	1.47	
C.D. at 5%	24.68	0.56	8.98	NS	2.64	4.31	

Table 2: Dry matter accumulation (gm⁻²) of rice as affected by different date of transplanting and varieties

Treatment	Dry matter accumulation (g m ⁻²)			
	30 DAT	60 DAT	90 DAT	At harvest
Date of transplanting				
15 July	147.7	501.9	887.8	1009.8
25 July	138.8	466.9	832.3	1040.3
5 August	124.4	425.8	768.1	960.1
S.Em±	3.52	13.42	21.91	30.89
C.D. at 5%	11.11	42.28	69.06	97.33
Varieties				
Sarju-52	127.2	442.7	784.0	980.0
NDR-359	144.9	488.8	885.7	1007.1
Swarna	138.6	463.0	818.4	1023.0
S.Em±	2.75	9.23	16.09	20.93
C.D. at 5%	8.03	26.93	46.97	61.10

Table 3: Number of tillers (m⁻²) of rice as affected by different date of transplanting and varieties

Treatment	Number of tillers (m ⁻²)			
	30 DAT	60 DAT	90 DAT	At harvest
Date of transplanting				
15 July	226.3	610.1	626.2	613.7
25 July	212.8	570.4	587.0	575.3
5 August	190.8	567.5	541.8	530.9
S.Em±	5.08	11.07	15.45	14.72
C.D. at 5%	17.59	38.31	53.49	50.96
Varieties				
Sarju-52	205.2	538.1	553.0	541.9
NDR-359	212.5	562.8	577.3	565.7
Swarna	222.3	594.1	624.7	612.3
S.Em±	4.21	10.54	11.35	11.13
C.D. at 5%	12.52	31.34	33.72	33.08

Table 4: Leaf area index of rice as affected by different date of transplanting and varieties

Treatment	Days after transplanting		
	30 DAT	60 DAT	90 DAT
Date of transplanting			
15 July	2.13	4.53	4.92
25 July	2.01	4.22	4.62
5 August	1.80	3.85	4.26
S.Em±	0.04	0.12	0.12
C.D. at 5%	0.15	0.38	0.38
Varieties			
Sarju-52	1.84	4.00	4.35
NDR-359	2.00	4.18	4.54
Swarna	2.10	4.42	4.91
S.Em±	0.04	0.08	0.08
C.D. at 5%	0.11	0.24	0.26

Conclusion

It has been concluded based on the study that the variety Swarna was found suitable for rice cultivation as to harvest the higher yield.

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