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Performance of rice genotypes for high yield and weed competitiveness under wet direct-seeded condition

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Abstract

A field experiment was conducted during *kharif* season of 2022 at the Rice Research Station, Chinsurah, Hooghly, West Bengal to evaluate the weed competitiveness of different rice genotypes under wet direct-seeded condition. The experiment was laid out in a split-plot design with two weed management methods viz. moderate weed pressure (MWP) and low weed pressure (LWP) in main plots, and eight rice genotypes including four inbreds (Ajit, DRR Dhan 42, DRR Dhan 44 and Swarna Shreya), and four hybrids (27P37, 28P67, Arize 6444 Gold, and Arize 8433 DT) in sub-plots. The experimental field was infested predominantly with *Echinochloa colona*, *E. crus-galli*, *Cyperus difformis*, *C. iria*, *Fimbristylis miliacea*, *Commelina benghalensis*, *Eclipta alba*, *Euphorbia hirta*, *Marsilea quadrifolia*, and *Monochoria vaginalis*. The results revealed that total weed density and biomass at 60 days after sowing (DAS) under LWP were reduced by 47% and 53%, respectively, compared with those under MWP. Among the genotypes, the hybrid 'Arize 6444 Gold' recorded the lowest total weed density (28.67 m⁻²) and biomass (21.84 g m⁻²), exhibiting the highest weed control efficiency (69.68%) due to its weed competitive ability. It was followed by 27P37 and 28P67, whilst among inbreds, Ajit exhibited strong weed suppression and higher competitiveness. Yield performance was improved under LWP with competitive genotypes due to improved growth attributes viz. plant height, tillering ability, leaf area index, and root properties. Arize 6444 Gold produced the highest grain yield (5.87 t ha⁻¹) with benefit-cost ratio (1.75), followed by Ajit (1.68). Yield reduction to the extent of 25.84% was observed under MWP due to greater crop-weed competition. The study revealed that under MWP, adopting competitive rice genotypes such as Arize 6444 Gold, 27P37, and Ajit could reduce herbicide dependence, minimize hand weeding costs, and enhance productivity and profitability in wet direct-seeded system.

Keywords: Hybrids, inbreds, productivity, weed competitiveness, weed control efficiency, wet direct-seeded rice

Introduction

Over the past five decades, concerted efforts by different national and international research institutes, and all stakeholders have led to remarkable gains in global rice production. However, the pace of productivity growth must further accelerate in the coming years to meet the dietary and nutritional needs of an expanding population that relies heavily on rice as a staple food source (Mishra *et al.*, 2022) ^[13]. Global food demand is projected to rise from about 35% to 56% between 2010 and 2050 (Van Dijk *et al.*, 2021) ^[23]. Hence, supplying ever-increasing rice demand in a sustainable manner while using limited natural resources is a significant concern. Puddled transplanting, the traditional method of growing rice, requires large amounts of water, labour, and energy, making it increasingly unsustainable given the current shortage of resources (Kumar and Ladha, 2011) ^[10]. Wet direct-seeded rice (wet-DSR) is a viable and resource-efficient substitute for transplanting in many irrigated locations, particularly those with assured water supplies. In contrast to dry-DSR, which uses non-puddled dry soil for sowing, wet-DSR combines some of the agronomic benefits of both systems by planting pre-germinated seeds in puddled soil. When correctly managed, wet-DSR maintains yields comparable to transplanted rice while drastically reducing labour requirements and irrigation water use (by 6-12%) and also helped in early maturity (Rashid *et al.*, 2009) ^[17]. Additionally, it improves operational efficiency by enabling mechanized seeding, preventing transplant shock, and facilitating prompt

crop establishment. Weeds and rice seedlings emerge simultaneously due to a lack of standing water, resulting in a significant weed infestation under wet-DSR (Kumar *et al.*, 2023a) ^[11]. Season-long weed competition in wet-DSR caused 69.71% and 67.40% reductions in grain yield throughout the *kharif* and *boro* seasons, respectively (Raj *et al.*, 2013) ^[15]. Over-reliance on using a single herbicide results in the development of herbicide-resistant weed populations. When the crop establishment strategy is altered from puddled transplanted rice (PTR) to wet-DSR, the diversity of weed species and the intensity of weed infestation often change significantly (Chauhan, 2013; Kumar *et al.*, 2025) ^[2, 8]. Thus, an efficient weed management strategy is a necessity for the success of a wet-DSR crop and its efficient application. The introduction of weed-competitive rice genotypes is a low-cost approach that may reduce the need of chemical herbicides. Furthermore, using more competitive genotypes can reduce the production penalty and herbicide dependence since they inhibit weed growth, prevent future weed infestations, and integrate well into present agronomic techniques (Gibson *et al.*, 2003) ^[15]. Hybrids, given to their early vigour, may be able to supplement the limited set of competitive germplasm available for DSR. Weed competitive cultivars have stronger early vigour, larger leaf-area and biomass accumulation, quicker canopy ground cover, deep and prolific roots, more tillering capacity, taller plants, earlier maturity, and allelopathy (Dhillon *et al.*, 2021) ^[4]. The competitive abilities of different rice genotypes must be determined by evaluating the competitive effect of plants or their ability to suppress other individuals, as well as their competitive reaction or ability to avoid being suppressed. In herbicide-dominant systems, combining herbicides with crop species or genotypes with greater competitiveness can improve overall weed control efficiency (Mahajan and Chauhan, 2013) ^[12]. In light of these considerations, the present investigation was undertaken to assess the weed competitiveness of different rice genotypes for developing sustainable weed management strategies under wet-DSR system.

Materials and Methods

A field experiment was conducted during the *kharif* season of 2022 at the Rice Research Station, Chinsurah, Hooghly (Latitude 22°53' N, Longitude 88°22' E, and 8.61 m above mean sea level), situated in the Gangetic New Alluvial Zone of West Bengal. During the cropping season, the total rainfall receipt was 874 mm, with an average maximum and minimum temperature of 34.66°C and 24.13°C, respectively. The relative humidity ranged from a maximum average of 88.07% to a minimum average of 72.23%. The experimental soil was characterized as clay loam with 17.3% sand, 44.8% silt, and 37.9% clay, having 0.62% organic carbon. The available nutrient status of the soil was 291 kg N ha⁻¹, 80 kg P₂O₅ ha⁻¹, and 330 kg K₂O ha⁻¹. The experiment was laid out in a split-plot design with three replications. The main plot treatments consisted of two weed management methods, viz. moderate weed pressure (MWP) and low weed pressure (LWP). The sub-plot treatments comprised of eight rice genotypes, including four inbred varieties viz. Ajit, DRR Dhan 42, DRR Dhan 44, and Swarna Shreya, and four hybrids viz. 27P37, 28P67, Arize 6444 Gold, and Arize 8433 DT. Under MWP, a blanket post-emergence (PoE) application of Triafamone 20% + Ethoxysulfuron 10% WG (Ready Mix, 30% WG) was made at a rate of 45.0 + 22.5 g ha⁻¹ (pre-mix, 67.5 g ha⁻¹) at 15 days after sowing (DAS). The LWP treatment involved a similar PoE herbicide application at 15 DAS, followed by one hand weeding at 35 DAS to further reduce

weed competition. Pre-germinated seeds were sown manually under wet-DSR conditions at a spacing of 25 cm × 15 cm on the third week of June, 2022. The seed rate used was 30 kg ha⁻¹ for inbreds and 25 kg ha⁻¹ for hybrids. Fertilizers were applied in the form of urea, single super phosphate, and muriate of potash to supply nutrients at the rate of 80-40-40 kg N-P₂O₅-K₂O ha⁻¹ for inbreds and 90-45-45 kg N-P₂O₅-K₂O ha⁻¹ for hybrids. The full doses of P₂O₅ and K₂O were applied as basal during the final land preparation. Nitrogen was top-dressed in three splits: one-fourth at the early tillering stage, one-half at the active tillering stage, and the remaining one-fourth at the panicle initiation stage. In addition, all the experimental plots received a common application of farmyard manure (FYM) at 5 t ha⁻¹ during the final land preparation. To meet the micronutrient requirement, zinc sulphate (ZnSO₄·7H₂O) was also applied as a basal dose at 25 kg ha⁻¹. The crop was harvested at full maturity when about 85% of the grains turned straw to golden yellow. The harvested bundles were tagged, sun-dried, and threshed using a pedal thresher. Grains were cleaned by winnowing, sun-dried to 14% moisture, and weighed plot-wise, along with the corresponding straw yield after proper drying. At 60 DAS, weed observations were recorded using a 0.5 m × 0.5 m quadrat placed randomly at five locations per plot. All weeds within each quadrat were uprooted, sorted by different categories (grass, sedge and broad-leaved), and counted to determine weed density. The samples were then oven-dried to a constant weight to record total weed biomass. Weed competitiveness of the rice genotypes was evaluated using the weed competitive index (WCI) as proposed by Rezakhanlou *et al.* (2012) ^[18].

$$WCI = [V_{\text{infest}}/V_{\text{mean}}] / [W_i/W_{\text{mean}}]$$

Where, V_{infest} is the yield of the weed-infested genotype (i), while V_{mean} is the average yield of all genotypes in the presence of weeds. W_i represents the weed biomass of each genotype, while W_{mean} is the average weed biomass of every genotype. Weed control efficiency (WCE) of a genotype was measured by using the formula = {(Weed biomass in MWP - Weed biomass in LWP)/ Weed biomass in MWP} × 100. Ten randomly selected plants per plot were tagged for periodic observations. Growth parameters such as plant height, number of effective tillers, leaf area index (LAI), root length, and root volume were recorded at harvest. For LAI determination, leaves from the ten sampled plants were measured using a stationary leaf area meter, and values were expressed per unit ground area. Root samples were collected using a root auger, and roots were carefully washed to remove adhered soil following the procedure of Sewhag *et al.* (2011) ^[21]. Root volume (cc) was determined by the water displacement method as described by Bridgit and Potty (2002) ^[1]. The economic analysis was carried out by computing the benefit-cost ratio (BCR) as the ratio of gross return to total cost of cultivation. All collected data were statistically analyzed using OPSTAT software (CCS Haryana Agricultural University, Hisar). Analysis of variance (ANOVA) was performed to assess treatment effects, and mean differences were compared using the least significant difference (LSD) test at the 5% level of significance following a significant F-test.

Results and Discussions

Effect of treatments on weeds

The experimental field exhibited a diverse assemblage of grasses, sedges, and broad-leaved weeds under wet-DSR condition. Among these, *Echinochloa colona*, *E. crus-galli*, *Cyperus difformis*, *C. iria*, *Fimbristylis miliacea*, *Commelina*

benghalensis, *Eclipta alba*, *Euphorbia hirta*, *Marsilea quadrifolia*, and *Monochoria vaginalis* were predominant, contributing to the overall weed diversity, of which grass, sedge, and broad-leaved weeds constituted 29.38%, 12.66%, and 57.96% of the total weed biomass, respectively, at 60 DAS. Weed density at 60 DAS varied markedly with both weed management practices and rice genotypes (Table 1). Among the management treatments, LWP resulted in a pronounced decline in the population of grass (10.93 m^{-2}), sedge (7.57 m^{-2}), and broad-leaved weeds (8.93 m^{-2}) as compared to MWP, which recorded substantially higher counts across all weed categories. Overall, total weed density under LWP (27.44 m^{-2}) was almost 47% lower than that observed under MWP (51.07 m^{-2}). This reduction could be due to lower weed emergence and growth under wider crop canopy coverage. Similar findings were reported by Mahajan and Chauhan (2013) [12], who discovered that maintaining optimal crop stand and early canopy closure greatly reduced weed development in wet-DSR systems. Significant genotypic differences were also evident. Arize 6444 Gold consistently exhibited the lowest density of grasses (11.20 m^{-2}), sedges (7.87 m^{-2}), and broad-leaved weeds (9.60 m^{-2}), resulting in the minimum total weed density (28.67 m^{-2}). This was closely followed by 27P37, which was statistically comparable to 28P67 and Arize 8433 DT in terms of total weed density, indicating their greater ability to suppress weed emergence and establishment. Hybrids were reportedly more competitive than inbreds because of their rapid early growth, increased tillering capacity, and faster canopy coverage (Rao *et al.*, 2007; Chauhan, 2013) [16, 2]. LWP recorded significantly the lowest biomass of grasses (5.86 g m^{-2}), sedges (2.39 g m^{-2}), and broad-leaved weeds (11.29 g m^{-2}) as compared to MWP (Table 1). This reduction was approximately 53% lower than that under MWP in terms of total weed biomass. Among the genotypes, significantly the lowest total weed biomass was recorded in Arize 6444 Gold (21.84 g m^{-2}), followed by 27P37 (27.59 g m^{-2}) and 28P67 (28.43 g m^{-2}), confirming their superior weed-suppressive capacity. These findings highlight the superior competitiveness of rice hybrids in minimizing early-season weed infestation under wet-DSR. Similar results were reported by Dhillon *et al.* (2021) [4]. Among the hybrids, Arize 6444 Gold exhibited the highest weed control efficiency (WCE) of 69.68%, which was significantly superior to all others (Figure 1). It was followed by 27P37 (62.50%), Arize 8433 DT (58.13%), and 28P67 (52.05%), which also maintained comparatively high WCE values. Among the inbreds, Ajit recorded the highest WCE (50.54%), closely followed by DRR Dhan 44 (49.24%) and Swarna Shreya (49.19%). In contrast, DRR Dhan 42 exhibited the lowest WCE (38.35%), reflecting its relatively poor ability to suppress weed growth and maintain a competitive canopy under wet-DSR conditions. Across all genotypes, Arize 6444 Gold recorded the highest weed competitive ability (WCA) under both MWP (1.20) and LWP (1.37), demonstrating its superior competitiveness against weeds (Figure 2). Among the inbreds, Ajit and DRR Dhan 44 exhibited relatively higher competitiveness, closely followed by Swarna Shreya. In contrast, DRR Dhan 42 consistently recorded the lowest WCA values (0.88 under MWP and 0.75 under LWP), reflecting its poor competitive ability against weeds. Hybrids had a higher WCA due to their increased early vigour, extended root system, and effective resource utilization (Dhillon *et al.*, 2021) [4]. Overall, the findings confirmed that hybrids proved to be more weed competitive than inbreds, making them ideal candidates for wet-DSR where weed pressure is a key constraint.

Effect of treatments on growth attributes of crop

Growth attributes of rice were significantly influenced by both weed management methods and genotypes at harvest (Table 2). LWP recorded significantly higher values for all growth parameters compared with MWP. Under LWP, plants attained greater height (130.65 cm), produced a higher number of effective tillers (316 m^{-2}), and exhibited increased leaf area index (2.77), root length (24.1 cm), and root volume (48.52 cc) as compared to MWP (126.81 cm, 225 m^{-2} , 2.15, 22.98 cm, and 44.14 cc, respectively). Effective tiller percentage was increased to 40% when weed pressure was reduced from moderate to low. The improvement under LWP could be attributed to reduced crop-weed competition and better utilization of available resources. Among the genotypes, the tallest plant height (136.23 cm) was recorded in 28P67, which was statistically at par with 27P37 and closely followed by Swarna Shreya. The hybrid Arize 6444 Gold exhibited significantly the highest number of effective tillers (310 m^{-2}), leaf area index (2.79), root length (25.16 cm), and root volume (48.14 cc) among all genotypes, including both hybrids and inbreds. It was followed by 27P37 and 28P67, which also demonstrated superior growth performance, reflecting their strong vigour and efficient resource utilization under wet-DSR conditions. Taller plant height was described as one of the most important factors for weed competitive ability of the crops (Kumar *et al.*, 2016) [9]. This could be because of the benefits of certain additional morphological features, such as broader leaves that help shade developing weeds' deep roots for improved water absorption (Schreiber *et al.*, 2018) [20]. Rice genotypes with early vigour, rapid development, high leaf area index, and other characteristics had been identified to be responsible for crop competitiveness (Dass *et al.*, 2017) [3]. Among the inbreds, Ajit produced a significantly higher number of effective tillers (260 m^{-2}) and also recorded the highest leaf area index (2.36), which was statistically at par with DRR Dhan 44 and Swarna Shreya at harvest. Genotypes with higher biomass generated more number of tillers during the vegetative growth stage and demonstrated a significant ability to suppress weeds (Saito *et al.*, 2010) [19]. In terms of root length, Ajit and Swarna Shreya were found to be significantly superior to the other inbreds, indicating better root elongation and soil exploration ability. For root volume, Ajit and DRR Dhan 44 performed significantly better than the remaining inbreds. Deeper and more extensive root systems are advantageous in DSR, as they enhance plant stability and competitiveness against weeds by improving early growth and resource capture (Kumar *et al.*, 2020) [7]. The characteristic features related to root system development are reported to be significant in terms of increased nutrient absorption by crop plants (Schreiber *et al.*, 2018; Shekhawat *et al.*, 2020) [20, 22].

Effect of treatments on yield attributes and yield of crop

The yield attributes, productivity, and economic performance of rice were significantly influenced by both weed management methods and genotypes (Table 3) where the, LWP produced significantly higher panicle length (27.51 cm) and panicle weight (3.30 g) compared with MWP (24.91 cm and 2.82 g, respectively). Among genotypes, significantly the highest panicle length (27.38 cm) and panicle weight (3.26 g) was found in Arize 6444 Gold which was statistically at par with 27P37, 28P67 and Arize 8433 DT. Although test weight of grains remained statistically unaffected due to weed management methods but significantly differed among genotypes where Arize 6444 Gold had the highest test weight (24.99 g), remaining on

par with DRR Dhan 44, 28P67 and 27P37. LWP recorded higher grain yield (5.92 t ha^{-1}) and straw yield (7.13 t ha^{-1}) as compared to MWP (4.39 and 5.49 t ha^{-1} , respectively). A yield reduction of 25.84% was observed under MWP relative to LWP, primarily due to increased crop–weed competition. Irrespective of weed management methods, the hybrid Arize 6444 Gold produced significantly the highest grain yield (5.87 t ha^{-1}) and straw yield (7.07 t ha^{-1}), followed by 27P37, 28P67, and Arize 8433 DT, outperforming all the inbreds. Among the inbreds, Ajit produced significantly higher grain and straw yields, which were statistically comparable with DRR Dhan 44 and Swarna Shreya, indicating their relatively better performance. According to Moukoubi *et al.* (2011) [14], there was a strong positive correlation between weed competitiveness and tillering, plant height, and grain yield. The interaction effect between weed management and genotypes on grain yield (Table 4) was found to be significant, with Arize 6444 Gold under LWP registering the highest grain yield (6.78 t ha^{-1}). All genotypes produced significantly higher yields under LWP than MWP, confirming the adverse effect of weed pressure on productivity. A higher

BCR was also obtained under LWP (1.77) compared with MWP (1.44), indicating better economic returns under reduced weed pressure. Among genotypes, the highest BCR (1.75) was recorded in Arize 6444 Gold, which was statistically at par with Ajit (1.68). Similar kind of results was reported by Kumar *et al.* (2023b) [6].

The study demonstrated that reducing weed pressure significantly enhanced the growth, yield attributes, and productivity of wet-DSR. Under moderate weed pressure, hybrids such as Arize 6444 Gold and 27P37 along with the inbred ‘Ajit’ exhibited strong weed-suppressive ability, higher weed control efficiency, and superior yield performance. These genotypes can be effectively recommended for cultivation under moderate weed pressure conditions to minimize herbicide use and reduce the cost and labour requirements of manual weeding, particularly in areas facing labour scarcity and high weed infestation. Their adoption can contribute to sustainable and economically viable weed management practices in wet-DSR systems.

Table 1: Effect of weed management methods and rice genotypes on weed density (no. m^{-2}) and weed biomass (g m^{-2}) at 60 DAS under wet-DSR condition

	Weed density (no. m^{-2})				Weed biomass (g m^{-2})			
	Grass	Sedge	Broad leaved	Total	Grass	Sedge	Broad leaved	Total
Weed management methods								
MWP	4.58 (20.44)	3.79 (13.90)	4.15 (16.73)	7.18 (51.07)	3.55 (12.07)	2.42 (5.34)	4.96 (24.10)	6.48 (41.52)
LWP	3.38 (10.93)	2.84 (7.57)	3.07 (8.93)	5.29 (27.44)	2.52 (5.86)	1.70 (2.39)	3.43 (11.29)	4.48 (19.53)
S.Em $\pm$	0.04	0.03	0.02	0.05	0.04	0.02	0.02	0.04
CD (p=0.05)	0.26	0.17	0.13	0.28	0.22	0.11	0.14	0.22
Genotypes								
Ajit	4.13 (16.54)	3.44 (11.33)	3.72 (13.34)	6.46 (41.21)	3.15 (9.41)	2.14 (4.08)	4.33 (18.28)	5.68 (31.78)
DRR Dhan 42	4.33 (18.27)	3.63 (12.67)	3.95 (15.07)	6.82 (46.01)	3.39 (10.97)	2.32 (4.89)	4.74 (20.99)	6.19 (37.85)
DRR Dhan 44	4.19 (17.07)	3.52 (11.87)	3.79 (13.87)	6.58 (42.81)	3.20 (9.74)	2.19 (4.30)	4.42 (19.04)	5.79 (33.08)
Swarna Shreya	4.27 (17.74)	3.57 (12.27)	3.88 (14.53)	6.71 (44.54)	3.26 (10.15)	2.23 (4.47)	4.49 (19.63)	5.89 (34.24)
27P37	3.83 (14.13)	3.18 (9.60)	3.52 (11.87)	6.01 (35.61)	2.91 (7.98)	1.97 (3.37)	4.09 (16.24)	5.30 (27.59)
28P67	3.91 (14.80)	3.24 (10.00)	3.55 (12.13)	6.12 (36.94)	2.98 (8.35)	2.01 (3.52)	4.13 (16.56)	5.38 (28.43)
Arize 6444 Gold	3.42 (11.20)	2.89 (7.87)	3.18 (9.60)	5.40 (28.67)	2.59 (6.18)	1.78 (2.65)	3.67 (13.01)	4.73 (21.84)
Arize 8433 DT	4.03 (15.74)	3.28 (10.27)	3.57 (12.27)	6.23 (38.28)	3.07 (8.94)	2.04 (3.65)	4.16 (16.80)	5.47 (29.39)
S.Em $\pm$	0.06	0.04	0.03	0.06	0.05	0.03	0.04	0.05
CD (p=0.05)	0.19	0.12	0.09	0.19	0.15	0.08	0.11	0.15

Table 2: Effect of weed management methods and rice genotypes on crop growth parameters at harvest under wet-DSR condition

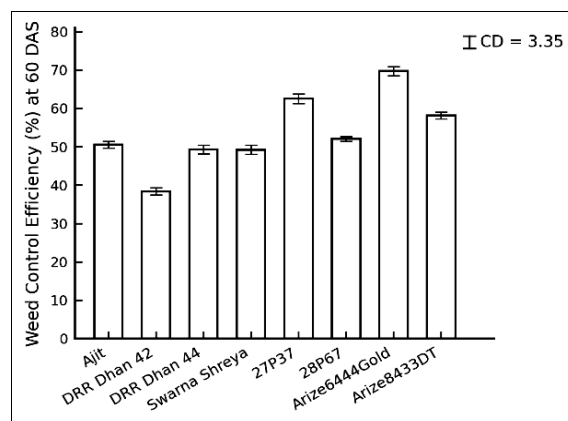
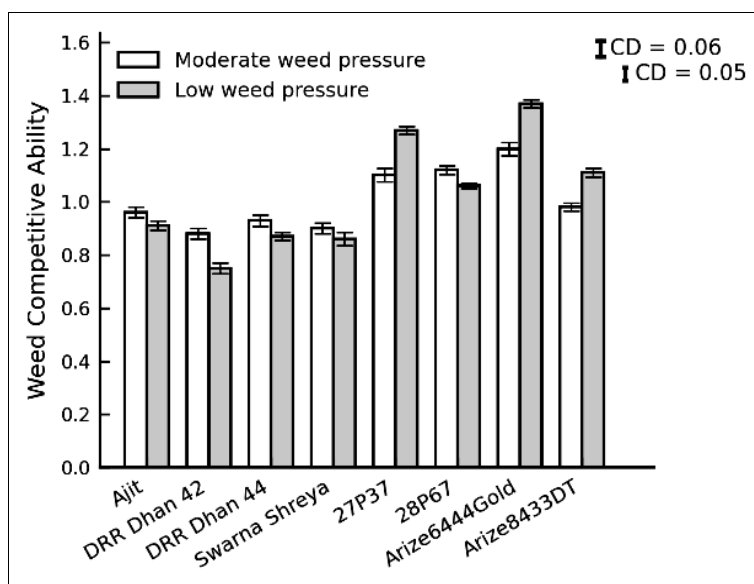
	Plant height (cm)	Effective Tiller (number m^{-2})	Leaf area index	Root length (cm)	Root volume (cc)
Weed management methods					
MWP	126.81	225	2.15	22.98	44.14
LWP	130.65	316	2.77	24.10	48.52
S.Em $\pm$	0.31	1.20	0.01	0.04	0.07
CD (p=0.05)	1.89	7.33	0.09	0.26	0.41
Genotypes					
Ajit	120.45	260	2.36	22.80	45.90
DRR Dhan 42	125.12	243	2.26	21.78	44.91
DRR Dhan 44	127.75	257	2.33	22.28	45.62
Swarna Shreya	132.45	252	2.31	22.75	45.24
27P37	134.45	284	2.57	24.75	47.14
28P67	136.23	282	2.55	24.71	46.98
Arize 6444 Gold	129.95	310	2.79	25.16	48.14
Arize 8433 DT	123.43	276	2.49	24.11	46.71
S.Em $\pm$	1.04	2.94	0.03	0.10	0.14
CD (p=0.05)	3.01	8.53	0.09	0.29	0.40

Table 3: Effect of weed management methods and rice genotypes on yield attributes and benefit cost ratio under wet-DSR condition

	Panicle length (cm)	Panicle weight (g)	Test weight (g)	Grain yield (t ha ⁻¹)	Straw yield (t ha ⁻¹)	BCR
Weed management methods						
MWP	24.91	2.82	24.06	4.39	5.49	1.44
LWP	27.51	3.30	24.12	5.92	7.13	1.77
S.Em±	0.13	0.03	0.13	0.03	0.04	0.01
CD (p=0.05)	0.80	0.19	NS	0.19	0.21	0.05
Genotypes						
Ajit	25.97	3.02	23.91	4.95	6.10	1.68
DRR Dhan 42	25.42	2.92	23.27	4.72	5.85	1.58
DRR Dhan 44	25.81	2.99	24.79	4.89	6.03	1.62
Swarna Shreya	25.58	2.96	22.63	4.84	5.98	1.63
27P37	26.63	3.15	24.44	5.39	6.56	1.63
28P67	26.50	3.12	24.59	5.34	6.52	1.49
Arize 6444 Gold	27.38	3.26	24.99	5.87	7.07	1.75
Arize 8433 DT	26.41	3.09	24.13	5.23	6.39	1.53
S.Em±	0.35	0.06	0.25	0.08	0.08	0.02
CD (p=0.05)	1.02	0.17	0.72	0.24	0.23	0.07

Table 4: Effect of interaction between weed management methods and rice genotypes on grain yield under wet-DSR condition

Genotypes (G)	Grain yield (t ha ⁻¹)	
	Weed management methods (W)	
	MWP	LWP
Ajit	4.28	5.63
DRR Dhan 42	4.10	5.35
DRR Dhan 44	4.22	5.57
Swarna Shreya	4.13	5.55
27P37	4.52	6.26
28P67	4.65	6.03
Arize 6444 Gold	4.97	6.78
Arize 8433 DT	4.28	6.18
W × G		
S.Em±	0.12	
CD (p=0.05)	0.34	

**Fig 1:** Effect of weed management methods and rice genotypes on weed control efficiency at 60 DAS under wet-DSR condition**Fig 2:** Effect of weed management methods and rice genotypes on weed competitive index at harvest under wet-DSR condition

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