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Screening of Coarse Varieties for Direct Seeded Rice

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Research Article

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ABSTRACT

A farmer test was directed to decide the suitable variety under DIRECT SEEDED RICE (DSR) without compromising the yield and quality of rice. Three varieties kala Shah Kaku (KSK-133, KS-282, and KSK-434) were tested. The most suitable coarse variety under Direct Seeded Rice was kala shah kaku (KSK-133) at local condition performed well in yield and quality as well. Coarse variety KSK-133 was better in improving the tillers, panicle length, 1000 grains weight, number of grains per panicle, and yield. It also reduces the sterility percentage along with quality parameters. Overall, in conclusion, for improvement of rice yield and quality Kala Shah Kaku (KSK-133) variety may be recommended as best one in Direct Seeded Rice (DSR) under local conditions.

INTRODUCTION

Rice (*Oryza sativa* L.) is a most essential staple nourishment of about portion of the total population. Asia is the leader in rice grows creation and claim to deliver over 90% of world rice. More than 75% of the world's rice is devoured by people in Asian countries and in this way the rice is of unfathomable hugeness for sustenance security in Asia. Rice being comprehensively imperative sustenance money trim holds a one of a kind status in Pakistan's farming. It is the second most essential staple sustenance edit after wheat and third biggest money trim after wheat and cotton in Pakistan. It is an imperative monetary product and its fare represented 4.9% of significant worth included farming and 1% of GDP. In introduce, Pakistan is developing rice on a territory of 2.57 m ha with a normal yield of 2396 kg·ha^{-1}. A promising technique for rice development is vigorous direct seeding instead of puddling and transplanting rice seedlings. Direct seeding is a substitute of rice transplanting system which requires only two laborer hours to sow a comparative zone. It requires less water, work and capital sources of capital inputs. Seeding thickness (seed rate) applies a lashing impact on rice grain yield, on account of its mighty impact initially in edit development and improvement and finally on rice yields [1]. To control the focused costs in neighborhood and universal items, it is basic to diminish the factor by embracing the proper planting methods for rice generation. For this reason, innovative work exercises were started on new rice foundation advances, for example, raised bed planting, coordinate seeding and oxygen consuming rice development in different parts of the world [2]. These frameworks are to be received in nations by virtue of the water lack in numerous parts of the country [3].

In Pakistan, rice transplantation is normally performed by employed costly work, which isn't particular to keep up the required plant populace to accomplish higher efficiency. To beat this trouble, coordinate seeding of rice appears to be just plausible options in protecting agriculturists [4]. This technique decreases labor requirement by over 25% in term of working hours. The info necessities and the interest in coordinate seeded rice are much lower than in transplanted rice [5]. Direct seeded rice, if oversaw appropriately, can yield as remarkable as transplanted rice [6]. The present examination was led to assess the execution of coarse rice assortments under DSR in the agro-climatic state of D I KHAN region, AGRI UNI, KPK, Pakistan. The upsides of the conventional transplanted puddled rice (TPR) arrangement of product foundation incorporate expanded supplement accessibility (e.g. press, zinc, phosphorus), weed concealment [7]. Simple seedling foundation and making anaerobic conditions to upgrade

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supplement accessibility [8]. The transplanted puddled rice (TPR), prompts higher misfortunes of water through puddling, surface vanishing and permeation [9]. Coordinate seeding in soaked soil has been generally embraced in southern Brazil, Chile, Venezuela, Cuba, some Caribbean nations, and in specific territories of Colombia [10]. DSR is being rehearsed with different changes of culturing/arrive readiness and harvest foundation (CE) which are utilized to suit site-particular prerequisites, however has not picked up fame, despite the fact that numerous exploration ponders propose its advantages over TPR [11,12]. Wet DSR is basically done under work deficiency circumstance and is by and large at present rehearsed in Malaysia, Thailand, Vietnam, Philippines, and Sri Lanka [13,14]. The rice cultivation system in the world is affected by water deficiency, less availability of suitable land and shortages of worker [15]. According to the currently statistics, 23% of world is using direct-seeded method for rice cultivation [16]. Labour saving of DSR method induced by preparation of nursery and TPR, causes the reduction of 11.2% in total production cost.

DSR strategies have a few focal points over TPR [17]. Notwithstanding higher financial returns, DSR crops are quicker and less demanding to plant, less work escalated and devour less water. To enhance introductory product foundation and the aggressiveness of direct-seeded rice, assortments with higher germination and speedier seedling rise with more overwhelming seedlings under dry direct-seeded conditions must be chosen to limit the dangers experienced in coordinate seeding [18]. Amid the vegetative stage, quick ground cover accomplished with early vegetative energy [19-21] can diminish soil dissipation and quicken root access to soil water and supplements [22]. Horticultural generation in the 21st century is anticipated to be more constrained due to bring down accessibility and expanded cost of water and supplement assets [23]. Decreased supplement take-up if there should arise an occurrence of nitrogen and phosphorus has been the most imperative factor for bring down yield in direct seeded development frameworks contrasted and overflowed frameworks of rice development [24] and is a specific worry in low-input rain bolstered frameworks. This underscores the direness of enhancing the rice root framework with the goal that plants can catch supplements more proficiently. Techniques of effective supplement obtaining incorporate root morphology for investigating supplements in soils through the development of hub roots with shallow points and more scattered sidelong roots [25], and the advancement of longer parallel roots with more root hairs [26]. Under current circumstance of water and work shortage, ranchers are changing either their rice foundation techniques just (from transplanting to coordinate seeding in puddle soil i.e. Wet-DSR) or both culturing and rice foundation strategies (puddle transplanting to dry direct seeding in unpuddled soil i.e. Dry-DSR). DSR is a noteworthy chance to change creation practices to accomplish ideal plant thickness and high-water profitability in water rare territories. Reception of DSR for swamp rice culture would essentially diminish expenses of rice generation [27].

The current study was conducted to evaluate the best suited variety in direct seeded rice system, in terms of yield and quality.

MATERIAL AND METHODS

Site description

This experiment was conducted at DIKHAN district, AGRI UNI, KPK, Pakistan. This farm is situated at 74.243°E 31.809°N and 214 meters above the sea level. The farm is consisted of 44 acres of fertile land designated for research experiments and seed productions of rice and other crops.

Experimental design

Sowing

Sowing of all three varieties was done by using hand drill on 20th May 2015, in well prepared moist field. Seed rate was used 37kg/ha for each variety. All other practices were same except different varieties (KSK-133, KS-282 & KSK-134). Nitrogen (230 kg/ha), Phosphorus & Potash (150 kg/ha) and Zinc (15 kg/ha) were applied according to recommendation in the form of Urea, DAP, MOP and Zinc sulphate 33%, accordingly. Phosphorus& Potash was applied as a basal dose along with 20% of total Nitrogen at the time of sowing. Remaining 80% nitrogen (Urea) was applied in two splits. One at 25 days after sowing (DAS) with Zn& was applied at 15 DAS (Active Tillering Stage).

Crop parameters

Germination Count was taken at 15DAS, while, Plant Height, Panicle length, filled grains, unfilled grains, total grains and sterility were measured at maturity 1000 grains weight, Yield & Quality Data were taken after harvesting.

Statistical analyses

The data were subjected to analysis of variance using MSTATC for a Randomized Complete Block Design (RCBD) and significant differences determined using Fisher's analysis of variance technique and LSD test at 5% probability was used to compare the differences among treatments [28].

RESULTS AND DISCUSSION

Boron application has great influence on filled grains per panicle, unfilled grains per panicle, add up to grains per panicle, Panicle length and sterility rate as shown in **Table 1**. It is quite obvious from the results that Basal+Foliar dose of Boron has great impact on filled grains, total grains, and panicle length and sterility %. As statistically evident that the application of Basal+Foliar

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dose of Boron (T3) resulted in maximum no. of filled grains, total grains and panicle length with minimum sterility %, followed by T4 and T3. However main sterility % was observed in T1 (Control) with limited no. of grains filled and short panicle length. Results are given in **Table 2**, which shows that T3 has highest 1000 grain wt (g), Yield Kg/plot, Yield Kg/acre and Yield Maunds/acre, followed by T4, T3 and T1 respectively.

Table 1. Effect of Boron application on filled grains per panicle, unfilled grains per panicle, add up to grains per panicle, Panicle length and sterility rate.

Treatments	Filled Grains/panicle	Unfilled Grains/panicle	Total grains/panicle	Panicle length	Sterility %
Control T1	104d	27a	131c	26.8a	20.6a
Basal dose of Boron T2	119c	14b	133bc	27.9a	10.5b
Basal+Foliar dose of Boron T3	142a	8d	150a	28.6a	5.3d
Foliar dose of B T4	128b	10c	138b	28a	7.2c

Table 2. Influence of Boron application on 1000 grains weight, yield.

Treatments	1000 grains wt (gm)	Yield (Kg/pot)	Yield (Kg/acre)	Yield (Maunds/acre)
Control T1	19d	768c	1536	38.4
Basal dose of Boron T2	21c	845b	1690	42.25
Basal+Foliar dose of Boron T3	24.6a	910a	1820	45.5
Foliar dose of B T4	23b	880ab	1760	44

Boron plays its part in sterility percentage as shown in **Figure 1**. This graph displaying that sterility percentage is maximum in T1 (control, no application of boron) followed by T2 (Basal application of boron 3 kg per acre), T4 (foliar application of 640 g of boron in 120 Liter of water) and T3 (Dual application of boron basal [3 kg per acre] and foliar [640 g of boron in 120 Liter of water]) respectively.

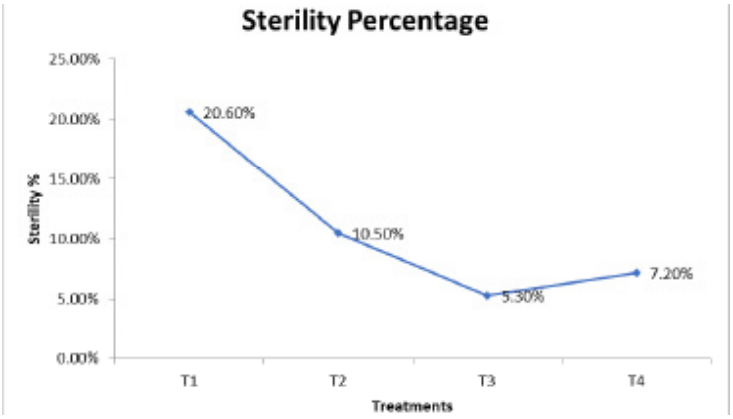

Figure 1. Effect of treatments on sterility percentage.

The comparison of yield in filled grains, unfilled grains and total grains per panicle in T1 (control, no application of boron), T2 (Basal application of boron 3 kg per acre), T3 (Dual application of boron basal [3 kg per acre] and foliar [640 g of boron in 120 Liter of water]) and T4 (foliar application of 640 g of boron in 120 Liter of water) respectively is given in **Figure 2**. According to the graph T3 (Dual application of boron basal and foliar) showed maximum filled grain and total grains followed by T4, T2 and T1.

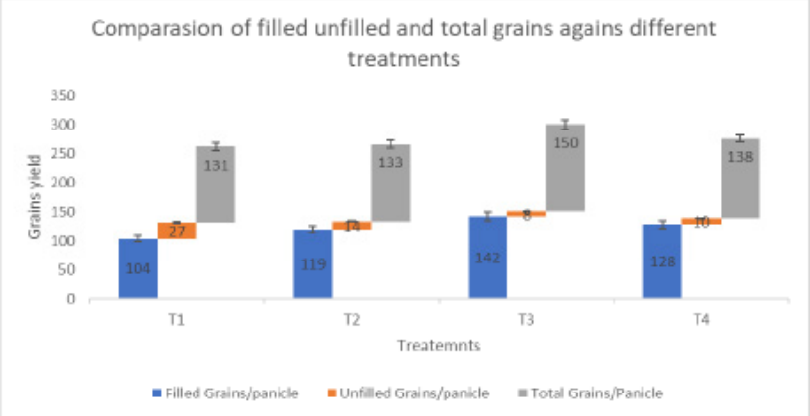

Figure 2. Effect of treatments on grains yield.

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CONCLUSION

DSR is reasonable practice that can possibly create exceptional returns and to defeat the issue of work and water deficiency. By comparing the traits of different coarse verities under Direct Seeded Rice culture practice, it can be inferred from the results that kala shah kaku (KSK-133) variety was proved excellent in terms of adjusting to local condition, yield and quality. It also reduces the sterility percentage along with quality parameters. Overall, in conclusion, for improvement of rice yield and quality Kala Shah Kaku (KSK-133) variety may be recommended as best one in Direct Seeded Rice (DSR) under local conditions. Both agronomic organization and a reasonable assortment with fitting characteristics are relied upon to achieve most noteworthy potential under DSR. It would be great if the abilities of agriculturists to oversee normal assets in practical way are upgraded and rice profitability is expanded through creating information and innovation of direct seeding by method for research and expansion exercises.

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