

*Short Communication*

**BG 374: A NEW RICE VARIETY SHOWING COMPARATIVELY HIGHER YIELD POTENTIAL FOR GENERAL CULTIVATION OF SRI LANKA**

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**INTRODUCTION**

Rice cultivation in Sri Lanka is very important for food security as it is the staple food of Sri Lankans. The Department of Agriculture has officially released 84 rice varieties since 1958. However, only around 20 varieties are popular among farmers due to many reasons such as yield potential, pest and disease resistance, adaptability to diverse agro-climatic conditions and consumer preference. Many farmers are used to cultivate rice varieties of 3 1/2 months maturity duration due to less water requirement for longer duration and comparatively high yield potential. To ensure the national food security in future, it is essential to improve yield potential of our rice varieties further. However, yield potential is not the only determinant, but good pest and disease resistance and adoptability over diverse environments with better cooking and eating quality characteristics should be considered.

Bg 352, At 362, Bg 94-1, Bg 359 and Bg 366 are the most popular rice varieties in the 3 ½ month maturity group, grown in larger extents covering almost all rice lands of Sri Lanka (RRDI, 2015). All these varieties belong to Intermediate Bold (IB) and Long Medium (LM) grain type. Each of these varieties have their own genitival problems for which farmers are requesting new replacement varieties. Therefore, one of the objectives of the rice breeding program at RRDI is to develop rice varieties having comparatively higher yield potential under irrigated conditions with pest and disease

resistance and acceptable grain quality. Newly developed varieties should also possess wide adoptability over diverse environments in a target region. Thus, the Objective of the present study was to develop a rice variety in 3 ½ month maturity group with comparatively higher yield potential and pest and diseases resistance having consumer accepted grain quality attributes and wider adoptability over diverse environments in the Dry and Intermediate zones and the Wet zone of Sri Lanka.

### **Methodology**

Breeding objective of 3 1/2 month Rice variety improvement program mainly concern about the comparatively higher yield potential with resistance to major pest and disease and good grain quality attributes having farmer acceptance. To address this issue, hybridization and selection program was initiated using the parental combination of Ld 12-38-1 / Bg 360 in early 2005 *Yala* season. Generations of this cross combination was advanced using modified bulk method. In 2007 *Yala* and 2007/08 *Maha* individuals and their progenies were selected and line number Bg 08-2398 was promoted to Preliminary Yield Trial Preliminary Yield Trial (PYT) in 2008 *Yala* season. It was tested with other lines of PYT with four replicates in a Randomized Complete Block Design (RCBD) at RRDI, Bathalagoda in 2008 *Yala* season. It demonstrated a good yield advantage over Bg 357, which was the standard check variety. After two testings, it was promoted to Major Yield Trials (MYT) conducted in 2009 *Yala* and 2009/10 *Maha* seasons. Then, the line was screened against Brown Plant Hopper (BPH), Rice Gall midge and Rice blast in NCRVT programs in 2010 *Yala* to 2011 *Yala* seasons and resulted in with Moderate resistance to Brown Plant Hopper, Rice Gall midge and Blast. Also it was evaluated for Response to different nitrogen fertilizer levels from 0 to 150 N/ha in replicated yield trials in 2011/12 *Maha* and 2012 *Yala* seasons at RRDI. The results of candidate variety performance particularly to nitrogen: 150N/ha represented in Table1. Grain Quality assessment was done with Bg 352 raw rice in 2011 *Yala* season. The test line showed an acceptable grain quality attributes and cooking qualities over the standard check variety. Line was nominated to National Coordinated Rice variety Trial (NCRVT) to test the adaptability in different Agro-climatic zones representing Dry and

Intermediate Zones and Wet Zones of Sri Lanka from 2009 *Yala* to 2011 *Yala* under research management. It was tested with other lines in NCRVT four replicates with Randomized Complete Block Design (RCBD). The mean grain yield of Bg 08-2398 across different locations within agro-ecological zones are presented in table 2. In the Dry Zone trials were conducted in Mahailuppallama, Aralaganwila, Vaunia, Sammanturei, Ambalantota and Girangurukotte research stations. Also in Bathalagoda represented Intermediate Zone and Bombuwala, Benthota and Labuduwa represented Wet Zone of Sri Lanka.

Due to promising yield performance in NCRVT and pest and Disease resistance testing programs, the candidate variety was promoted to Varietal Adoptability trial (VAT) level conducted under farmer field conditions in different agro-climatic zones of Sri Lanka. Because of very good yield advantage in farmer fields in VAT, it was promoted to Large Scale VAT in Dry, Intermediate and Wet zones of Sri Lanka. In 2012 *Yala*, 2012/13 *Maha*, 2013 *Yala* seasons and it was tested in LSVAT resulting excellent yield performance in farmer fields.

## RESULTS AND DISCUSSION

Mean grain yield of Bg08-2398 and the standard check Bg 357 in station Major Yield Trial (MYT) at RRDI (Transplanted) over 2009 *Yala* and 2009/10 *Maha* seasons. In station yield trial showed that the candidate variety Bg 08-2398 recorded comparable yields to the standard check variety Bg 357.

**Table 1. Response of candidate variety with check variety to Nitrogen level at RRDI, Bathalagoda**

Variety	Yield (t/ha)	
	2011/2012 <i>Maha</i>	2012 <i>Yala</i>
Bg 08-2398	3.82a	4.18a
Bg 366(Standard)	3.58a	4.29a
LSD	0.79	1.19

The candidate line performed well with the standard check variety and it has good response to added nitrogen level of 150 N/ha over the standard control of Bg 366.

**Table 2. Mean grain yield and adaptability rank of Bg 08-2398 in comparison to the standard checks Bg 357 and Bg 366 in NCRVT over 3 seasons in Dry, Intermediate Zones and Wet Zone locations**

Season	Agro ecological zone and number of Locations	Mean Grain yield (t/ha)	
		Bg 08-2398	Standard check
2010 <i>Yala</i>	Dry & Intermediate Zone - 6 loc.	4.91 (3)	5.59 (1) (Bg 357)
	Wet Zone - 3 loc.	4.01 (1)	3.77 (4) (Bg 357)
2010/11 <i>Maha</i>	Dry & Intermediate Zone - 7 loc.	4.62 (1)	4.41 (2) (Bg 357)
	Wet Zone - 2 loc.	3.77 (2)	3.80 (2) (Bg 357)
2011 <i>Yala</i>	Dry & Intermediate Zone - 7 loc.	4.80 (2)	5.07 (1) (Bg 366)
	Wet Zone - 3 loc.	2.86 (3)	3.18 (1) (Bg 366)

Adaptability rank based on variance component method is given in parentheses

Almost in all the locations, the candidate variety Bg 08-2398 recorded comparable yields and adaptability in comparison to the standard check variety Bg 366. The candidate variety Bg 08-2398 recorded adaptability rank 2 in 2012 *Yala* and 2012/13 *Maha* seasons in all agro ecological zones in VAT and found to be a comparable to the standard check Bg 366 producing higher grain yield. Almost all locations in LSVAT, the candidate variety Bg 08-2398 has resulted high average grain yield than the standard check variety.

## CONCLUSION

This Bg 08-2398 Advanced candidate rice line showed very good yield performane, pest and disease resistance and grain and cooking quality characters. Also it showed a wide adaptability to different agro- ecological zones of Sri Lanka. It responds well to added chemical nitrogen fertilizer. The new rice line, Bg 08-2398 was released as Bg 374 in 2016 Variety Release Committee as a new rice variety for general cultivation in Sri Lanka.

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