Booklet is subject to Seasonal Review

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Guyana Rice Development Board

Management Guidelines for the Cultivation of GRDB 16

MANAGEMENT GUIDELINES FOR GRDB 16

1. **Synchrony in Sowing**

- It is critical to sow within the sowing period which is (sowing must be completed) during the periods November 15 - December 31 (first crop) and May 15 - June 30 (second crop).
- All attempts must be made for farmers in an area to sow during the prescribed period so that maximum sunlight is available during flowering and grain filling.

Sowing of Seed Paddy

2. **Land Preparation**

- Do not prepare the land hurriedly.
- During preparation, the land must be allowed to rest for at least 3 days between activities.
- All stubbles, old roots, etc. must be removed during land preparation and before sowing.

3. **Seed Source**

- Only use seeds that are approved by GRDB.

Characters	*GRDB 16 (FG12-259)*
Agronomic and Morphological	
Head Rice Recovery (HRR)- Paddy	58.0 ± 3.0 (%)
Total Rice Recovery (TRR)- Paddy	69.0 (%)
Head Rice Recovery (HRR)- Brown	82.0 (%)
Total Rice Recovery (TRR)- Brown	88.0 (%)
Grain Expansion- Length (GEL)	75.21 (%)
Grain Expansion- Width (GEW)	67.17 (%)
Cooking Time (White rice)	15-18 mins
Cooking Time (Parboiled)	18-20 mins
Alkali Spreading Value (ASV)	5

Breeder's Remarks

GRDB 16 (Breeding line FG12-259) provides a good option for farmers to stabilize and enhance their yield and quality. Good crop management is required throughout the life of the plant to ensure high level of productivity. It is crucial that special care must be taken to ensure availability of balance nutrition during the crop cycle to achieve a healthy crop which produces high yields with good quality grains.

It is foreseen that this variety will be a good economic choice for the farmers and there will be a rapid expansion of acreage across the country. It would not be surprising to see this variety claim 30% of the cultivation in the next six seasons. With the release of this high yielding variety and the rapid adoption by farmers, it is expected that the national productivity will increase to 6.5t/ha in the next four to six seasons. It is expected that this variety along with the GRDB 10 and 15 will occupy the majority of the farmlands across the country in the next few seasons.

Dr. Mahendra Persaud, A.A.
Chief Scientist/Plant Breeder

Characters	*GRDB 16 (FG12-259)*
Agronomic and Morphological	
Phenotypic Acceptability (PAcp)	Excellent
Awning (An)	Short and partly awned
Awn colour (AnC)	Straw
Apiculus Colour (ApC)	Straw
Stigma colour (SgC)	Yellow
Lemma and Palea colour (MPC) [Grain Colour]	Straw
Lemma and Pubescence (LmPb)	Short hairs
Sterile Lemma Colour (SLmC)	Straw
Sterile Lemma Length (SLmL)	Medium
Days to Flowering	75 - 78
Days to complete Flowering	80- 83
Dormancy (Days)	0-7
Maturity (Mat)	110-112 days
Grain Yield Potential (bag/ac, t/ha)	7-8 t/ha 9 (45-51 bags/ac)
Harvest Index (HI)	42%
Disease	
Blast (*Pyriculariagrisea*)	Resistant to Highly Resistant
Brownspot (*Cochliobolus miyabeanus* (*Bipolarisoryzae, Drechsleraoryzae*).	Moderately Resistant
Sheath Blight (*Thanethoporuscucumeris*, *Rhizoctonia solani*)	Moderately Resistant
Sheath Rot (*Soracladium oryzae*)	Moderately Resistant
Grain	
Grain Length (GrL)	10.0-11.0 (mm)
Grain Width (GrW)	2.6-2.7 (mm)
Brown Rice Length (BrLn)	[7.8mm ± 0.3] (Long to Extra Long)
Brown Rice Width (BrW)	[2.3mm ±0.05]
Brown Rice Shape (BrS)	Slender (over 3.0)
White Rice Length (WrLn)	7.20 ± 0.3 mm
White Rice Width (WrW)	2.0 mm
1000 Grain Weight (GW)	28-30g
Chalkiness (Clk)	2.0 (%)- Small

4. Seed Treatment

Treating of seeds before sowing will reduce the infestation of water weevil and leaf miner. “Cruiser” can be used at a rate of 1.25 mls/kg of seed at least 7 days before soaking. Fipronil at a rate of 1.98 mls/kg seed after soaking seeds, but before germination begins.

5. Germination

- Use clean water only. Do not use muddy or stagnant water when soaking seeds.
- Soak seeds for 24 to 30 hours. At the end of the soaking period remove/drain off excess water.
- Incubate (*press*) seeds for 36 to 48 hours, when broadcasting by hand. NB: 24 hours will be sufficient if broadcasting by aircraft.
- Light wetting (watering) may be necessary during incubation.

Germinated Seed Paddy

6. Seed Rate

On fairly level and uniform fields, sow only 100 to 110 lbs per acre (112.2 to 123.4 kg/ha) of clean seeds.

7. Water Management

- After final land preparation, allow 2 to 3 days for suspended sediments to settle before sowing the pre-germinated seeds in standing water.
- Drain fields 2-3 days after sowing. Fields can then be flooded 6 to 7 days after draining.
- Grow the crop through flooded conditions of 3" to 4" (7.5 cm to 10 cm) if your field has a history of weed (red rice and grasses) problems.
- Ideally, water should be completely drained for the application of fertilizers or post emergence herbicide
- Maintain adequate water level (3" to 4" or 7.5 cm to 10 cm) until around 90-95 days after seeding., then drain the field completely, for harvesting.

8. Weed Management

- Weeds are controlled most effectively by the use of an integrated programme, which combines different control methods.
- Good weed management practices include cleaning of machinery and implements; good land preparation; appropriate seed rate; good water management; field sanitation; and the appropriate fertilizer application.
- Varietal character (excellent early vigor, good tillering ability, early canopy) of this genotype enhance weed management.
- Water management is crucial for managing weeds in rice. Maintain 3" to 4" of water throughout the crop.
- Chemical control: weed control must be undertaken early. Herbicide application around 14 to 18 days after sowing (DAS) is best recommended so that it can facilitate fertilizer application and

Some Characters of the GRDB 16

Characters	*GRDB 16 (FG12-259)*
Agronomic and Morphological	
Seedling Vegetative Vigour(Vg)	Extra vigorous
Tillering Ability (Ti)	Low (5 - 7)
Culm Strength (Cs)	Moderately Strong
Lodging Incidence (Lg)	0-5 (%)
Plant Height (Ht)	Semi dwarf (less than110)
Leaf Senescence (Sen)	Intermediate
Leaf Length (LL)	50 cm
Leaf Width (LW)	12 mm
Leaf Blade Pubescence (LBP)	Pubescence
Leaf Blade Colour (LBC)	Dark Green
Basal Leaf Sheath Colour (BLSC)	Green
Leaf Angle (LA)	Erect
Flag Leaf Angle (FLA)	Erect
Ligule Length (LgL)	18 mm
Ligule Colour (LgC)	White
Ligule Shape (LgS)	Cleft
Collar Colour (CC)	Light Green
Auricle Colour (AC)	Light Green
Culm Length (CL)	90.6 cm
Culm Number (CN) per plant	7
Culm Angle (CmA)	Erect (<30°)
Diameter of Basal Internode (DBI)	5.6 mm
Culm Internode colour (CmIC)	Green
Panicle Length (PnL)	27-29 cm
Panicle Type (PnT)	Intermediate
Secondary Branching of Panicles (PnBr)	Absent
Panicle Axis (PnA)	Slightly Drooping
Panicle Exertion (Exs)	Well exerted
Panicle Treshability (PT)	Easy
Spikelet Fertility (SpFert)	Fertile (86%)

12. Roguing

- Roguing is the act of removing undesirable plants from the seed field.
- Roguing is done to remove off-type plants, plants of varieties other than those under production and plants of red rice.
- Roguing is very important for the production of pure seed.
- First roguing is done at the vegetative stage, second at flowering and final before harvesting.

13. Harvesting

- Drain fields between 90-95 days after sowing, depending on the weather conditions.
- The crop will be ready to harvest at approximately 110-112 days.
- Harvest at 18-22 % moisture for best milling recoveries, germination and vigour.
- Reduce grain moisture to less than 16% within 24 hours.

GRDB 16

Harvesting

subsequent irrigation. Some herbicides recommended are Nominee and Nomina, Rice Weed Killer, and Designee. Drain fields for effective herbicide application, then flood after 24-48 hours.

9. Nutrient Management

- Fertilizer recommendation should be based on a chemical soil analysis.
- The following Fertilizer Combination was found to be very effective:

Fertilizer Application	Time of Application (days)	Type of Fertilizer	Rate of Application
First Dose	Land preparation or 14-21	MOP	½ - ¾ bag /ac
	Land preparation or 14-21	TSP	½ - ¾ bag /ac
	14-21	Urea	½ - 1 bag /ac
Micronutrient	21 - 25	Boron	¼ pt /ac
Second Dose	38-42	MOP	¼ bag /ac
		Urea	1 bag /ac
Micronutrient	45 - 50	Boron	¼ pt /ac
Third (optional -based on the leaf colour, plant height)	56	Urea	¼- ½ bag /ac

Soil Test: In cases where a soil test report is available, stick to the recommendations. (NPK Fertilizers (6:25:25 or 8-32-16) can be applied at a rate of 220 lbs per acre at land preparation or 14 to 21 days after sowing (DAS) as replacement for TSP and MOP).

10. **Disease Management**

- This variety is resistant to rice blast disease (*Pyricularia oryzae*) and tolerant to Brown spots (*Bipolaris oryzae*, *Cochilobolus miyabeans*).
- It is important to have an Integrated Disease Management (IDM) approach to manage rice diseases, particularly Brown spots.
- Some useful tips: sow within the prescribed sowing dates; use clean and disease free seeds at the recommended seed rates, avoid applying excess Nitrogen (N) fertilizer, use Potash (K) fertilizer, control alternative host, avoid water stress, practice good sanitation.
- Recommended use of fungicides:

  NB: All fungicide treatment must be applied in two motor blowers of spray solution per acre.

Application	Timing of Application	Name of Fungicide	Rate of Application
First Application	60-65 DAS or at 5% flowering	Fugi-one, Antracol, Manzate or carbendazim	200-300ml/ac or 200-300g/ac
		Glory	600-800 g/ac
Second Application (optional if disease incidence is observed to be low)	After flowering	Fugi-one, Antracol, Manzate or carbendazim	200-300ml/ac or 200-300 g/ac
		Glory	600-800 g/ac

11. Pest Management

- An Integrated Pest Management (IPM) approach is recommended to effectively manage pest populations. IPM, which includes block planting, proper field sanitation, monitoring for early detection of insects pests, destruction of egg masses and application of insecticides, can form the basis for the insect pest management regime.
- Application of insecticides against early season pest and Paddy Bugs must be done based on threshold.
- Recommended threshold: Leaf miner: 10-15% damage; caterpillar: 25-30% damage; water weevil adult: 35-50% leaf scar; water weevil larvae: 5 larvae/plant or 10-15% yellowing or stunting; Paddy bugs: 1 bug/2sweeps.
- Insecticides for management of insect population are as follows:

Insect Pest	Insecticides	Rates
Early Season Pest (leaf miner, water weevil and caterpillar).	Cruiser as a seed treatment	1.25 ml in 18.6 ml water to 1 kg seed
	Reginil (Fipronil 20%)	16-26 ml per acre
	Mortel (Fipronil 20%)	40-50 ml per acre
	Fastac (alpha-cypermethrin)	60 ml per acre
	Pronto (Imidacloprid 70%)	15-20g per acre.
Paddy Bugs	Systemic Insecticide:	
	Pronto	15-20g per acre
	Renova	40-50 ml per acre
	Sydbar	50-60 ml per acre
	Contact Insecticides:	
	Fastac	60-80 ml per acre
	Hyperkill	60-80 ml per acre
	Jackpot	50-60 ml per acre