

Crop Selection and Management Strategies to Combat Weather Related Vagaries in Coastal Bengal

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ABSTRACT

Presently, the crop production in coastal Bengal is seriously challenged by monsoonal vagaries. As the cropping practice in this region is mainly monsoon-driven, any kind of weather aberration exerts ill effects on crop production system. Cyclonic storms, believed to be the effect of climate change, occur in quick succession that causes partial or total crop loss. Moreover, economic backwardness of the farming community in this locality poses a great challenge for coping up this situation. In the present article, we have highlighted the crop selection and management strategies that need to be adopted at the time of weather aberrations. Both short and long-term strategies need to be followed to protect farmers from experiencing greater economic loss due to monsoonal vagaries.

Key words : Coastal region, Climate change, Contingency crop planning, Cyclonic storm, Weather vagaries

Introduction :

In coastal-saline zone of West Bengal, the cropping practice is mainly driven by monsoonal rain (Alipatra *et al.*, 2014). The monsoon arrives by the middle of June. The monsoon rains in West Bengal are caused solely by the current of wind from the Bay of Bengal. Variability is a common characteristic feature of the monsoon in West Bengal, particularly in coastal belt of West Bengal. Breaks in the continuity of rain are usual and the resultant troughs of low pressure developed into cyclonic

storms especially towards the end of rainy season and in early autumn.

Cropping in this zone is further challenged by greater soil variability that exists on time and space scale. Coastal saline soil of West Bengal are mostly silty-clay type, rich in Mg^{2+} , Na^+ , Ca^{2+} , Cl^- and SO_4^{2-} salts. Soils are low to medium fertile, with average pH 7.5-8.5. Average amount of soluble salts in soil varies from 3-18 m-mhos cm^{-1} (Bandyopadhyay *et al.*, 2003). Due to presence of high Mg, the soils become hard and dry and get deflocculated when wet leading to impeded drainage condition.

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Agricultural practice of the region is predominantly rainfed. Most of the lands are mono-cropped occupying *kharif* paddy only (Mainuddin *et al.*, 2019). The productivity of *kharif* rice in the coastal zone of West Bengal is significantly low ranging from 2.0 to 2.5 t ha⁻¹ (Alam *et al.*, 2017; Sarangi *et al.*, 2019).

Frequently observed weather aberrations :

During recent past, this state has faced different weather related vagaries like delayed onset of monsoon, flash flood in many pockets and severe cyclonic storms like *aila*, *hudhud*, *amphan*, *yaas* etc. Such variations in climate and sudden departure from the normal climatic conditions have a great negative impact on agriculture as a whole. Moreover, due to the change of climate some areas are expected to receive more rainfall and temperature while other areas may get deficient. The elevated temperature and CO₂ level by induced climate change may affect the growth, yield components and ultimately yields of the crop grown in this region. Insect and disease incidences are also likely to be affected due to this climate change.

Considering the above background, there is a constant need of contingent crop planning for the whole state, coastal-saline zone in particular. An attempt has been made to fulfill the need through this manuscript.

Cropping under unpredictable weather conditions :

Mono-cropping is the main practice in this zone, and this zone needs special attention from the agricultural researchers. Research on multiple cropping,

identification of elite genetic resources (particularly for rice), introduction of new crops need the knowledge base of rainfall and run-off, soil moisture regime, residual moisture and some other basic data. Recent success of sunflower besides traditional vegetables after *kharif* rice has drawn attention to improve the knowledge on crop-climate-soil relationship issues.

Precautions for *kharif* rice under delayed monsoon :

- a) Nitrogen application in nurseries may be avoided when the seedlings are over-aged.
- b) When seeds are sown in dry-wet nurseries, transplanting of 25 days old seedlings @ 4-6 seedlings hill⁻¹ and increasing of the plant density from 33 to 44 hills m⁻² should be done.
- c) Aged seedlings may be transplanted with precautions like maintaining 50 to 60 hills m⁻², application of phosphorus (P), potash (K) and zinc (Zn) as a basal dose for good stand establishment and growth. The 2/3rd nitrogen (N) may be applied as basal and remaining 1/3rd N should be applied at panicle initiation (PI) stage.
- d) The delayed sown or delayed transplanted crop needs proper care to give a good yield. Proper intercultural operation and time to time weeding are required for better crop stand.

Some contingency measures under delayed monsoon in coastal saline zone of West Bengal have been listed below (Table 1).

Table 1. Contingency measures under delayed monsoon

Weather situation	Suggested contingency measures
When rain occurs after of 15 th July	Adopt system of rice intensification (SRI) method cultivation, cultivate salt tolerant and local popular varieties like <i>Dudheshwar</i> , <i>Hamilton</i> , <i>Nonaswarna</i> , <i>Jarava</i> , <i>Lunishree</i> , <i>Banshkanta</i> , <i>Khayersal</i> , <i>Hamai</i> (85 days duration), <i>Marichsal</i> , <i>Langalmota</i> , <i>Nona Bokra</i> , <i>Rupsal</i> , <i>Patnai-23</i> , <i>Kalma</i> , <i>Kumragore</i> etc.
When dry spell continues from 15 th to 30 th July	Prefer short duration rice varieties (var. <i>Shatabdi</i> , <i>Khitish</i> , <i>Ranjit</i> etc.). <i>Paira</i> cropping with grass pea, lentil and rapeseed-mustard can also be done.
When rain occurs after 30 th July	Same as mentioned above
If dry spell continues after 30 th July	Grow <i>rabi</i> crops with conservation tillage practices
When rainfall occurs after 15 th August	Alternate crops like sunflower (var. PAC 361, KBSH 44) and pulses (grass pea and blackgram) can be grown. Mungbean (var. Pant Mung-5) can also be grown in salt affected areas.

Source : Adopted from Banerjee *et al.* (2013)

Strategies to be adopted after occurrence of cyclonic storms :

After the incidence of any cyclonic storms like *aila*, *hudhud*, *amphan*, *yaasetc.*, which causes havoc damage during last few years, special attention should be given on salinity status of the soil in this region. It is next to impossible to flush out the stagnant saline water in many low-lying areas. Hence, a robust measure for reclamation of the sea water inundated land, short-term plan to restore the standing agricultural crops and vision for long-term contingent plan to protect the agricultural land and the livelihood of

farmers in coastal areas are urgently needed.

A) Short-term plan :

- i) Provide drainage facilities to drain out excess water wherever possible.
- ii) Spread sheaves (bunch of cereal stalks or stems of other grasses) loosely in the field or field bunds.
- iii) Cultivated *dhaincha* (*Sesbania spp.*) as a proven means for reducing salinity and increasing fertility of the soil in coastal regions.
- iv) Apply organic manure to neutralize the salinity.

- v) Apply gypsum (CaSO_4 , $2\text{H}_2\text{O}$) and basic slaked lime (2 t ha^{-1}).
- vi) Go for ponding of fresh water for leaching of salts wherever possible.
- vii) For *kharif* paddy cultivation, go for salt tolerant and submergence tolerant varieties of rice like *Hamilton*, *Getu*, *Tilak*, *Kachari*, *Patnai 23*, *Sitashal*, *Rupshal*, *Dudheshwar* etc. Salt tolerant HYVs like CSR-13, CSR-4, CSR-23, *Swarna* sub-1, *Lunishree*, *Sabita*, *SwarnaMasuri*, *Lalat*, *Santoshi*, *Super Shyamali*, etc. can be grown in lowlands with moderate salinity. Special characteristics (Table 2) as well as performance (Table 3) of few tested rice cultivars in Kakdwip region under coastal agro-ecosystem have been well documented by Banerjee *et al.* (2018a). Nurseries can be raised elsewhere, where the soil remained unaffected, in most cases outside the affected villages. Different modern types of climate-resilient nurseries like Community nursery, Dapog nursery etc. may be adopted. The seedlings may be distributed to the farmers of the affected villages through local administration and/or NGOs. Staggered sowing of seed (7-10 days interval) in the nursery bed of *kharif* rice can be adopted.
- viii) For Jute cultivation, immediate removal of water, if there is no drainage channel available, formaking pits of $20 \text{ cm} \times 20 \text{ cm}$ at intervals of 10m along the gradient is important. If the plants are of about 4 feet height, then 8-10 plants are needed to be tied up together. In case of late planting if the crops are 30 days old or so, the excess

field water should be removed and sprayed with copper oxychloride @0.25% to avoid seedling blight or damping off. After drainage of the stagnant water, 2% DAP and 1% MOP can be sprayed to boost the growth of the plants. This excess water can be stored in nearby ponds for retting of the jute plants.

- ix) In betelvine cultivation, it is recommended to replace all the damaged vines immediately. Propping and staking of the plants is necessary. Matured betel leaves should immediately be harvested for marketing. Also, drain out the flood water and pluck the mud affected leaves. For next season cultivation, cut the tip of the survived betel vines and plant those in 1:1 mixture of soil and cow-dung slurry and 20-25g of lime in the perforated poly-packets. Vines should be collected from damaged *boroj* and raise betelvine rooted cuttings of local varieties (especially *Meetha Pati*) in nursery under institutional or community basis and supply to the farmers of the affected areas for initiation new *boroj*. Apply 1% bordeaux mixture or 0.4% copper oxychloride as drenching on the soil for protection from diseases.

B) Long-term plan :

- i) Soil test and crop need based fertilization with the help of established soil and water testing laboratory is needed.
- ii) Leaching off surface salt into deeper soil profile would be beneficial.
- iii) *In-situ* rain water harvesting in dug out farm ponds, main drains and natural

- creeks in farmland for subsequent use in crop fields can be done.
- iv) Seed priming before sowing should be done. Overnight soaking of seeds in water/nutrient solution, pre-sowing soaking of seeds in $\text{KH}_2\text{PO}_4/\text{Na}_2\text{HPO}_4$ solution can be done.
 - v) Seed treatment with VAM and use of bio-fertilizer *viz.* *Rhizobium*, PSB and bio-stimulant (sea weed extract) in crop cultivation is mandatory. *Rhizobium* symbiosis is sensitive to salinization ($> 100 \text{ mMNaCl}$), hence may affect the nodule formation and N-fixation. High salinity tolerant legumes may be grown in coming *rabi* season along with high salinity tolerant *Rhizobium* (200-400 mM NaCl) inoculation. Other legumes along with moderate salinity tolerant (100-200 mM NaCl) *Rhizobium* strains can be applied at least after 2 rainy seasons. Use of salinity tolerant N-fixing bio-fertilizers like *Azotobacter*, *Azospirillum* etc. and P-solubilizing bacterial bio-fertilizers like *Bacillus*, *Pseudomonas* etc. may be effective in rice and other crops at least after one rainy season.
 - vi) Adoption of integrated nutrient management practices (combined use of inorganic and organic sources of NPK) is essential. Use organic amendments (FYM, green manuring, green leaf manuring with *Sesbania* spp., composted coir pith, press mud etc.) for building up soil fertility. Use of rice husk biochar, polyacrylamide as amendment in problem soils is important. Production and use of vermin/farm compost and their subsequent use in crop field is highly needed.
 - vii) Soil salinity with high pH may create micronutrient deficiency particularly Zn. So, foliar application of Zn @ 1.0% $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ solution to rice is advisable for better nutrition. Need-based application of micronutrients and foliar spray of 2% urea/DAP can be done at pre-flowering stage of both rice and succeeding crops for enhancing seed yield.
 - viii) Need based growth stage-wise irrigation scheduling is required. Integrated use of surface water and saline ground water for irrigation purpose could be a better proposition. Life-saving irrigation to the successive rice-fallows is very important.
- Plan for growing subsequent *rabi* crops :**
- Special attention should be paid for *rabi* crops as they are supposed to grow after timely or late harvesting of preceding *kharif* paddy. In this regard, selection of crops and their management is very crucial in order to get good harvest. Crop-specific strategies that need to be adopted during *rabi* season are summarized below.
- i) ***Boro paddy* :**
Rice varieties like IET 4786 (*Satabdi*), *Lalat*, WGL 20471 (*Lal minikit*), IR 36, CR 126-42-1, IET 1444, IET 2233, IET 4094 (*Khitish*) etc. can be grown successfully during *boro* season. Rice cultivars like *Rajendra Bhagwati*, *Kanak*, *Dudheshwar* etc. can be grown in lowlands with moderate salinity. Before sowing, rice seeds are to be treated with mancozeb + carbendazim at 2 g or *Trichoderma viridae* at 10 g by

dissolving in 10-12 ml water for per kg seed; and then a paste of fungicide solution is prepared and rubbed on the seeds. Timely seed sowing in the nursery (1st to 15th December) and timely transplanting (15th to 30th January) with 40-45 days old seedlings is necessary for better crop growth and yield. Apply 54.25 kg neem coated urea + 312.5 kg SSP + 63 Kg MOP ha⁻¹ as basal. Then add 108.5 kg neem coated urea ha⁻¹ at maximum tillering stage (1st top-dressing) and another 54.25 kg neem coated urea + 20 kg MOP at panicle initiation stage (2nd top-dressing).

ii) **Rabi maize :**

Different varieties like, P 3396, Deccan 103, Deccan 105, P 3546, P 3522, *Rajkumar*, All-Rounder, 900 M Gold. PAC 740 etc. may be used. Few recently released hybrid maize cultivars in Kakdwip region under coastal agro-ecosystem have been tested by Samanta *et al.* (2022) and their performance in *rabi* season under late sown condition is depicted in Table 4. Follow ridge and furrow method of sowing as it is better than conventional method (flat sowing), particularly in medium lands with moderate salinity. Optimum plant population (66,666 plants ha⁻¹) should be maintained following planting geometry of 60 cm × 30 cm. Apply 5 ton FYM per ha at 10 days prior to sowing. Further, apply 174 kg urea, 375 kg SSP, 120 kg MOP and 25 kg ZnSO₄ (Zinc Sulphate) ha⁻¹ as basal. Top-dressing of urea in two splits *viz.* 130 kg at knee-high stage and 130 kg at pre-tasseling stage should be done.

iii) **Lentil :**

Lentil can be cultivated as relay crop and seeds are to be broadcasted at least 7-10 days before harvest of *kharif* paddy. Suitable varieties like WBL 77 (*Moitree*), L 4717 (Pusa Ageti), KLS 09-3, PL 8, IPL 316 etc. should be sown @ 30 kg seed ha⁻¹. Sowing of lentil should be completed between 1st and 30th November for sole cropping. For sole cropping, apply only 250 kg of SSP and 35 kg of MOP at the time of final land preparation (basal). If required, a light irrigation can be given during pre-flowering stage. Two foliar sprays of boron @ 0.2% (before and after flowering) can be effective. Spray either with DAP or urea @ 2% during flowering stage is effective in maintaining plant vigour.

iv) **Grass pea :**

Grass pea can be grown as relay crop and seeds are to be sown at 7-10 days before harvest of *kharif* paddy. Relay sowing should be completed between last week of October and second week of November. Suitable varieties like *Nirmal*, *Ratan*, *Prateek*, *Bidhan Khesari* - 1 etc. should be sown @ 60 kg seeds ha⁻¹. Residual soil fertility and moisture of in paddy field can supplement nutrient and water requirement of the succeeding grass pea crop. Foliar application of boron @ 0.2% twice (before and after flowering) is beneficial. To maintain plant vigour either DAP or urea @ 2% can be sprayed during flowering stage.

v) **Rapeseed-mustard :**

For *utera* / *pair* cropping, seeds of mustard (cv. B-9, TBM 143 etc.) can

be sown at least 10-12 days prior to harvesting of preceding *kharif* paddy. For sole cropping, sowing of mustard should be completed within third week of October to second week of November. Varieties like *Binoy*, *Varuna*, Pusa Bold, *Kranti*, *Bhagirathi*, PM 2-3, PM 99-125, PM 5, PM 28, PM 30, YSH 0401, NRCHB 101, TBM 204 etc. are suitable. Performance (Table 5) of few rapeseed-mustard cultivars grown in Kakdwip region under coastal agro-ecosystem has been recorded by Banerjee *et al.* (2018b). Seeds are to be treated with Carbendazim (Bavistin) 50 WP (2 g kg⁻¹ seed) at least 4 hours before sowing. Organic seed treatment with *Trichoderma viridae* @ 5 g kg⁻¹ seed can be effective. Crop under line sowing method should be maintained with proper planting geometry (20-25 cm × 10 cm). Apply 3 ton FYM ha⁻¹ at 10 days prior to sowing. Further, apply 43.5 kg urea, 250kg SSP, 67 Kg MOP ha⁻¹ as basal. Then urea is top-dressed in two splits *viz.* 87 kg at branching stage and 43.5 kg at flowering stage. Application of at least two irrigations at branching and flowering stages is necessary. In sulphur-deficient soil, application of 45 kg sulphur ha⁻¹ is necessary.

vi) **Sunflower :**

Furrow sowing of sunflower as *rabi* crop should be done during 2nd fortnight of November. For delayed planting, sowing can be extended upto 30th December. Prior to sowing, seed are soaked in freshwater (1:1 W/V) for about 14 hours and dried in shade. Seeds of suitable varieties like PAC 361, Sunbred 275, *Aditya*, JK *Chitra*, KBSH

53, KBSH 78 can be sown with a seed rate of 4-5 kg⁻¹ at a spacing of 60 cm × 30 cm. Apply FYM or compost @ 8-10 t ha⁻¹ about 2-3 weeks before sowing. In addition to that 120 kg N, 40 kg each of P₂O₅ and K₂O ha⁻¹ should be given under irrigated condition. Full dose of phosphate and potash, and half of nitrogen as basal; while 1/4th N at bud stage (30 DAS) and rest 1/4th N at pre-flowering stage (45 DAS) are to be top-dressed. In saline soils, sunflower should be sown on ridges with additional 20 kg N ha⁻¹. Soil application of boron @ 3 kg B ha⁻¹ (through Borax, 11% B) should be done just before sowing. Otherwise, foliar application of B @ 0.2% may be adopted (through Granubor, 15% B, Solubor 21% B) twice at 45 and 55 days after sowing (DAS). Irrigate the crop at critical stages of crop growth, namely seedling, flowering bud initiation (35-40 DAS), flower opening (55-65 DAS) and seed filling (65-90 DAS). Wherever bee activity is low, supplemental hand pollination is must on alternate days preferably in the morning (8-11am) for 2 weeks. Otherwise, maintaining 4-5 hives ha⁻¹ provides optimum yield of the crop.

Conclusion :

Crop cultivation in coastal areas of Bengal is facing serious challenges due to unprecedented natural calamities during past few years. Based on weather forecast data, preparedness with contingent plan is the key to cope up with any type of monsoon vagaries. Knowledge and information management system in regard to crop zone mapping, developing livelihood

baselines, database, networking etc. should be strengthened and rapid livelihood assessment is also required to develop contingency crop planning. Programme on community awareness on disaster risk reduction in case of drought and floods should be organized. Vulnerability and capacity assessment along with inter-cluster coordination for rapid damage and need assessment should be carried out at different locations.

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Table 2. Special characteristics of the tested rice cultivars grown in coastal agro-ecosystem

Type of cultivars	Name of the cultivars	Duration (days)	Special characteristics
High Yielding Variety	<i>Pratiksha</i>	125	Salinity tolerant; can withstand water stagnation; resistant to sheath blight disease; soft straw
	<i>Santoshi</i>	135	Salinity tolerant; absolutely disease-free
	<i>Sabita</i>	140	Salinity tolerant; can withstand water stagnation; higher incidence of stem borer; incomplete seed setting
	<i>Super Shyamali</i>	140	Salinity tolerant; long grain; good for 'moori' making; moderate incidence of stem borer
	<i>Swarna Masuri</i>	130	Salinity tolerant; susceptible to sheath blight disease
Indigenous	Black rice	140	Salinity tolerant; grain colour black; absolutely disease-free
	<i>Dudheshwar</i>	125	Salinity tolerant; scented rice; can withstand water stagnation; fine grain; good for 'moori' making; fine straw; moderate incidence of stem borer
	<i>Kerala sundari</i>	125	Salinity tolerant; can withstand water stagnation; fine grain
Aromatic	<i>Radhatilak</i>	130	Salinity tolerant; scented rice; can withstand water stagnation
	<i>Gobindabhog</i>	130	Salinity tolerant; scented rice; fine straw and palatable for livestock; moderate incidence of stem borer

Source : Adopted from Banerjee *et al.* (2018a)

Table 3. Growth and yield performances of tested rice cultivars under coastal eco-system

Name of the cultivars	Plant height (cm)	Dry matter (g plant ⁻¹)	No. of tillers hill ⁻¹	No. of filled grains panicle ⁻¹	Test weight (g)	Grain yield t ha ⁻¹	Straw yield t ha ⁻¹	Harvest index (%)
<i>Pratiksha</i>	111 ^f	102 ^d	26 ^{ab}	131 ^f	20.25 ^e	5.40 ^b	5.25 ^c	47.0 ^c
<i>Santoshi</i>	117 ^e	91 ^e	28 ^a	221 ^a	30.65 ^a	6.00 ^a	5.25 ^c	53.3 ^a
<i>Sabita</i>	158 ^b	87 ^e	10 ^e	142 ^e	22.00 ^d	4.05 ^d	6.00 ^b	40.3 ^d
<i>Super Shyamali</i>	115 ^{ef}	142 ^a	24 ^{abc}	102 ^h	26.10 ^b	5.40 ^b	5.25 ^c	50.7 ^b
<i>Swarna Masuri</i>	94 ^g	48 ^h	11 ^e	160 ^d	19.60 ^e	4.50 ^c	3.75 ^d	54.5 ^a
Black rice	153 ^c	123 ^b	19 ^{bcd}	102 ^h	23.75 ^c	4.35 ^c	6.75 ^a	39.2 ^{de}
<i>Dudheshwar</i>	132 ^d	81 ^f	22 ^{abcd}	205 ^b	16.00 ^g	2.85 ^f	6.00 ^b	32.2 ^f
<i>Kerala Sundari</i>	130 ^d	109 ^c	25 ^{ab}	179 ^c	14.00 ^h	3.15 ^e	5.25 ^c	37.5 ^e
<i>Radhatilak</i>	119 ^e	106 ^{cd}	16 ^{de}	116 ^g	18.10 ^f	2.25 ^g	3.75 ^d	37.5 ^e
<i>Gobindabhog</i>	171 ^a	57 ^g	17 ^{cde}	91 ⁱ	13.25 ^h	1.95 ^h	3.75 ^d	34.2 ^f

Numbers followed by different letters indicate significant differences at $p < 0.05$ (otherwise statistically at par)

Source : Adopted from Banerjee *et al.* (2018a)

Table 4. Growth and yield performances of *rabi* maize hybrids under coastal eco-system

Cultivars	Plant height (cm)	Dry weight (g plant ⁻¹)	Cob length (cm)	No of seeds cob ⁻¹	1000-seed weight (g)	Grain yield (t ha ⁻¹)	Stover yield (t ha ⁻¹)	Harvest index (%)
P3396	235.33 b	470.20 b	18.41 c	655.07 b	310.22 b	6.09 b	9.12 a	40.04 a
H4226	192.27 c	428.52 c	16.19 d	587.12 c	295.18 c	4.23 c	8.35 c	33.59 b
<i>Yuvraj Gold</i>	201.27 c	472.50 b	19.64 b	663.98 b	313.59 b	6.54 b	9.77 a	40.12 a
LG34.05	253.67 a	485.16 a	22.28 a	764.02 a	325.06 a	7.02 a	10.16 a	40.80 a

Numbers followed by different indicate significant differences at $pd \geq 0.05$ (otherwise statistically at par) by Duncan's Multiple Range Test (DMRT)

Source : Adopted from Samanta *et al.* (2022)

Table 5. Growth and yield performances of rapeseed-mustard cultivars under coastal eco-system

Cultivars	Plant height (cm)	Dry weight (g m ⁻²)	Siliquae plant ⁻¹ (nos.)	Length of Siliqua (cm)	Seeds siliqua ⁻¹ (nos.)	1000-Seed weight (g)	Seed yield (t ha ⁻¹)	Stover yield (t ha ⁻¹)	Harvest index (%)
RB50	135.2	486.0	205.3	4.66	12.0	4.99	1.05	6.50	13.91
Pusa Bold	140.3	380.4	215.6	5.80	12.6	5.10	1.20	5.55	17.78
TM 106	152.6	490.7	195.6	5.69	11.0	5.60	1.30	5.60	18.84
<i>Kranti</i>	142.3	395.8	160.0	6.59	11.6	6.65	1.29	4.90	20.84
TM 217	159.0	422.9	215.0	6.01	12.6	6.00	1.45	5.85	19.86
TM 143	163.5	430.1	240.6	7.05	15.6	6.90	1.80	5.70	24.00
TM 204	165.2	485.4	210.3	6.80	14.4	6.71	1.75	5.90	22.88
B 85	129.0	295.6	130.6	4.42	10.3	3.70	0.95	3.10	23.46
LSD _{0.05}	5.72	26.33	14.70	0.72	2.06	0.76	0.34	0.95	—

LSD, Least significant differences at $pd \geq 0.05$ **Source :** Adopted from Banerjee *et al.* (2018b)