



## JorRG 09-05:A promising ridge gourd (*Luffa acutangula* Roxb.) selection from North East India

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### Research Paper

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### ABSTRACT

Ridge gourd (*Luffa acutangula* Roxb.) belonging to family Cucurbitaceae is a tropical and subtropical vine crop which is cultivated and consumed as vegetable. Twelve varieties including two check varieties (National check) were evaluated at the Horticulture Experimental Farm, AAU, Jorhat during Kharif seasons of 2009-2010 to 2011-2012 consecutively for 3 years to select the best performing ones under on station trials. The crops were raised at a recommended spacing of 2.0 m between rows and 1.0 m between plants and fertilized at the rate of 10t FYM, 20:30:30 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O per ha respectively. Three best performing selections along with the check varieties were tested in multilocation trials at different agro-climatic zones of the state through different KVKs and in farmer's field also. The investigation revealed that

the variety, RG 09-05 produced the highest mean yield of 111.7 q/ha over the National check variety, Arka Sujata whose mean yield was 82.5 q/ha. There was 35.4% increase in yield over the best check variety, Arka Sujata. The duration of the selection for its flowering was 45-50 days after sowing. Organoleptic taste indicated less cucurbitacin content in this variety as compared to others. Furthermore, the variety was moderately resistant to fruit rot as compared to others under field condition and was preferred more by the consumers. Based on the performance studies, the variety has been included in the AICRP trials for testing its adaptability throughout the country. The variety may be recommended after thorough study of other characteristics and be utilized in the crop improvement programme.

**Key words:** Ridge gourd, *Luffa acutangula*, Selection

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### INTRODUCTION

Ridge gourd (*Luffa acutangula* Roxb.) is an important member of the family Cucurbitaceae grown throughout the country. The immature fruits of the crop are used as a vegetable. It is nutritionally rich in vitamin A, C and Fe and has a considerable medicinal importance. India is considered as a primary centre of origin (Chakravarty, 1990). There is high variability in the genetic resources of ridge gourd in North Eastern part of India but most of them are poor yielder. Report of earliness in ridge gourd suggested that early maturity is dominant over late maturity (Sahni et al., 1987). In order to develop higher yielding varieties, an extensive investigation was carried out at AAU, Jorhat under state trials to identify a high

yielding ridge gourd variety which could be commercially grown by the farmers not only in Assam and North East India but also throughout the country.

### MATERIALS AND METHODS

The experiment was conducted at the experimental farm of the department of Horticulture, Assam Agricultural University, Jorhat during kharif season of 2009-2010 to 2011-2012 consecutively for 3 years with twelve varieties including two national check varieties. The trial was laid out in randomized block design (RBD) with three

**Table 1.** Weather data during Kharif seasons of 2009-2010 and 2011-2012 and its variation.

Month	Average Temperature (°C)			Average Relative Humidity (%)			Rainfall Total (mm)		
	2009-2010	2011-2012	Variation (+/-)	2009-2010	2011-2012	Variation (+/-)	2009-2010	2011-2012	Variation (+/-)
April	24.60	24.20	-0.40	80	75	-5	107.1	55.1	-52.0
May	26.80	26.90	+0.10	81	81.5	+0.5	190.5	509.9	+319.4
June	29.10	27.70	-1.40	82	84	+2	116.6	262.7	+146.1
July	29.45	28.75	-0.75	83	84	+1	304.4	462.3	+157.9
August	28.75	28.95	+0.20	85	85	0	278.8	325.3	+46.5
September	29.40	29.40	(-/+ )0	82.5	81.5	-1	167.8	180.9	+13.1
October	26.45	27.00	+0.55	82	77.5	-4.5	47.6	26.9	-20.7
Change in +/- direction			-1.70			-7.0			+610.3

**Table 2.** Performance of Ridge gourd variety, JorRG 09-05 in comparison to checks in different locations and zones.

Locations/Zones/Varieties	Fruit yield (q/ha)		CD (5%)
	JorRG 09-05	Arka Sujata / LC <sup>a</sup>	
<b>AAU, Jorhat</b>			
2009-2010	115	87	22.5
2010-2011	125	93	15.4
2011-2012	140	96	25.0
<b>Different Zones</b>			
Upper Brahmaputra Valley Zone (UBVZ)	108.0	76	-
North Bank Plain Zone (NBPZ)	69.9	45	-
Central Brahmaputra Valley Zone (CBVZ)	112.0	98	-
<b>Mean</b>	111.7	82.5	-
% increase over check	35.4	-	-
Duration (days) to flowering	45-50	45-50	-
Special characters	MR <sup>b</sup> to fruit rot	MS <sup>c</sup> to fruit rot	-
Benefit cost ratio	2.7	1.5	-

LC<sup>a</sup>= Local check, MR<sup>b</sup> = Moderately resistant, MS<sup>c</sup> = Moderately susceptible.

replications. The seeds were sown in the second fortnight of April every year following the recommended spacing of 2.0 m between rows and 1.0 m between plants. The recommended FYM at the rate of 10 t/ha and fertilizer dose at the rate of 20:30:30 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O per ha respectively were supplied to the crop. The observations were recorded on five randomly selected plants per replication for each genotype for most of the desirable characters like number of fruits per plant, fruit length (cm), fruit girth (cm), fruit yield (q/ha), duration in days to 50% flowering, single fruit weight (g) and number of seeds per fruit. The promising selections were tested in different agro-climatic zones of Assam through KVKs and in farmer's field also. The weather data for the crop seasons of all the years were also recorded for Jorhat condition. The data were analysed following appropriate statistical procedures adopted by various workers (Sahni et al., 1987; Chowdhury and Sharma, 2002; Rabbani et al., 2012).

## RESULTS AND DISCUSSION

The weather data presented in Table 1 showed that there was great variation on temperature, relative humidity and

rainfall from 2009-10 to 2011-12. During the experimental periods, there was decline in temperature by 1.7°C, relative humidity (RH) by 7% and an increase in rainfall by 610.3 mm. This might be an indication that there was climatic change in the North East India even in a short period of years. The fruit yield performance in terms of quintal per ha (q/ha) at AAU, Jorhat and different agro-climatic zones is presented in (Table 2). The pooled results showed that the variety, JorRG 09-05 had shown yield increase by 35.4% over the best check variety, Arka Sujata in AAU, Jorhat and in different agro-climatic zones of Assam. In some locations, it had shown moderate yield. This variation in yield might be due to genotype environment interaction. The duration to flowering was 45-50 days. Peter (2005) reported a high yielding short duration (60 days) ridge gourd variety 'Deepthi'. Study of natural incidence of fruit rot under field condition revealed that JorRG 09-05 was moderately resistant whereas Arka Sujata was moderately susceptible. The benefit cost ratio for this variety was 2.7 which was higher as compared to the check variety whose value was 1.5. Hence, JorRG09-05 was preferred over the other varieties. Morphological and other characters presented in table 3 revealed that the development of first female flower took place at 8<sup>th</sup> and first fruit at 17<sup>th</sup> node from the bottom. The fruits were long with 5 - 8 ridges.

**Table 3.** Morphological and other characters of the Ridge gourd variety, JorRG 09-05.

Characteristics	Observations/ Records
Leaf length	20 cm
Leaf breadth	18 cm
Leaf colour	Light green
Node at which first female flower appeared	8
Flower colour	Yellow
Petal length	2 cm
Male flower diameter	4.5 cm
Female flower diameter	5 cm
Node at which first fruit appeared	17
Peduncle length	15 cm
Fruit length	38 - 41cm
Fruit girth	11.5 cm
Fruit colour	Dark green
Ridge number	5 - 8
Fruits per plant	18
Single fruit weight	175 g
Seeds per fruit	138
Seed colour, surface and size	Black, rough, medium size

The colour of the fruits was dark green which drew the attention of the consumers. Average number of fruits per plant was 18 and seeds per fruit 138. In the national level, this variety is being tested throughout the country for its adaptability through the programmes of All India Coordinated Research project (AICRP). This ridge gourd selection JorRG 09-05 is spreading throughout the entire North Eastern States of India. From the organoleptic taste, it was found to have less cucurbitacin content than other varieties which is desirable for a cucurbitaceous crop.

## CONCLUSION

These studies provided a way to select the best performing variety for recommendation and enabled the breeders to use it as a genetic material for future breeding programmes. It could be concluded from the study that the variety JorRG 09-05 was the best yield performer and was also moderately resistant to fruit rot under field condition. Breeding approach could be adopted to improve most of the desired horticultural traits including fruit yield and quality parameters in order to develop a better quality stable variety.

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