

Original Research Article

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A New High Yielding Baby Corn Hybrid GAYMH-1 for Kharif Cultivation in Peninsular Zone and Central West Zone

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ABSTRACT

A new Baby corn hybrid, GAYMH-1 involving two diversified inbred parents was evaluated across the locations all over India during *kharif* 2015 to *kharif* 2017. It yielded on an average 14.36 Q/ha baby Corn yield and found 12.6 % superior in yield over the check HM-4 in the Peninsular Zone (PZ). It yielded on an average 22.99 Q/ha baby Corn yield and it is found 18.6 % superior in yield over the check HM-4 in Central West Zone (CWZ). From the quality point of view, this hybrid contains 87.25% moisture, 3.62 % total carbohydrate, 1.82% total soluble sugar, 1.52% reducing sugar, 0.30 % non-reducing sugar and 15.05% Vit.C (mg/100gm). This hybrid shows varying degree of resistant to major diseases in artificial condition in both the zone. It exhibited moderate resistant against CLS and moderate susceptible to moderate resistant against Charcoal rot and Turicum Leaf blight in PZ as well as moderate resistant against Charcoal rot, RDM and *Curvularia* Leaf Spot diseases in CWZ. Same way this hybrid exhibited varying degree of resistance to stem borer *Chillo partellus* in artificial condition. It exhibited moderate resistance against *Chillo partellus* in both the zone. Based on the overall performance and superiority over national check HM-4, it is identified and recommended to release for *kharif* cultivation in the PZ and CWZ.

Keywords

Baby corn,
CLS, *Chillo
partellus*, PZ, CWZ

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Introduction

Maize is highly versatile crop with high-yield and fast-growth. These characteristics make it suitable for wider use and production in the

developing world. Developing countries considered maize as grain for the poor and greens for the animal. However, now a days tender and immature cobs of corn are being used as vegetable (Galinat, 1985). This novel

use, known as baby corn (candle corn in Thai cook books), is becoming popular in domestic and foreign markets and has enormous processing and export potential. Domestic market for baby corn is growing due to the increase in number of farmers producing it. Its cultivation is popular in urban and *peri*-urban areas due to high market demand. There are two methods for producing baby corn either as a primary crop or as a secondary crop in a planting of sweet corn or field corn. In the first method, a seed variety is chosen and planted to produce only baby corn. Many varieties are suitable, but those developed specifically for baby corn tend to produce more ears per plant. In the second production method, the variety is selected to produce sweet or field corn. The second ear from the top of the plant is harvested for baby corn, while the top ear is allowed to mature. Miles Carol *et al.*, (2000). But the available varieties/ hybrids don't provide the better quality baby cobs. In kharif, some of the farmers are growing yellow varieties resulted in low productivity. Hence, there is a need to release medium maturing and high yielding bay corn hybrid to replace the composite/open pollinated varieties to enhance yield of baby corn. Therefore, this single cross GAYMH-1 was developed and released for cultivation in the PZ and CWZ.

Materials and Methods

A single cross hybrid Baby corn hybrid GAYMH-1 developed involved two inbred lines IGI-1101 and IGI-1103 in 2016-17 and was identified as baby corn hybrid. This hybrid was tested in AICRP system and trials were conducted at All Indian level across all the five zones comes under AICRP on maize network *i.e* NHZ, NWEZ, NEPZ, PZ and CWZ. The trials were conducted in Randomized Block Design with three replications by keeping 60 x 20 cm sowing distance. The multilocation evaluation of

hybrid carried out during *kharif* -2015 to *kharif*-2017. All recommended agronomical cultivation practices for agro climatic zones were practiced to raise crop for observing traits. The standard methods laid by Indian Institute of Maize Research, Ludhiana were adapted to record observations and statistical analysis.

Results and Discussion

The baby corn hybrid GAYMH-1 was tested across all the five zones. In Peninsular Zone (PZ), it yielded on an average 14.36 Q/ha Baby corn yield which is 12.6 % superior in yield over the best check HM-4. Similar results were also reported by Ashoka *et al.*, (2009). Same way, it yielded on an average 22.99 Q/ha baby corn yield which is found 18.6 % superior in yield over the check HM-4 in Central West Zone (CWZ) (table 1). Similarly, Sahoo (2001) also reported highest baby corn yield and green fodder yield in the tested varieties while studying fodder potential of varieties of baby corn.

This hybrid shows the varying degree of resistant to all prevailing major diseases in artificial condition. In PZ, it showed moderate resistant against CLS and moderate susceptible to moderate resistant against C. rust and TLB (table 2a). In CWZ, it showed moderate resistant against C. Rot, RDM and CLS diseases (table 2b). Similarly, it showed varying degree of resistant to Stem borer in natural condition. In both the zones, it showed moderate resistant against stem borer (*Chillo partellus*) (table 3). The quality point of view, this hybrid contains 87.25% moisture, 3.62 % total carbohydrate, 1.82% total soluble sugar, 1.52% reducing sugar, 0.30 % non-reducing sugar and 15.05% Vit.C (mg/100gm) (table 4). Similar results were recorded by Santosh Hooda and Asha Kawatra (2013).

Table.1 Baby corn yield in respective zones in AICRP (Baby corn yield weight)
(mean of locations in respective zone)

	Year of testing	Peninsular Zone (PZ)			Central West Zone (CWZ)		
		No. of trials/locations	GAYMH-1	National check HM-4	No. of trials/locations	GAY MH-1	National check HM-4
Mean yield Q/ha) Zonal Across zones	Kharif-2015	19	23.27	23.14	19	29.46	25.95
	Kharif-2016	23	10.91	8.78	23	23.47	21.81
	Kharif-2017	23	12.68	9.35	23	16.03	10.39
	Weighted Mean	-	14.36	12.75	-	22.99	19.38
Percentage increase or decrease over the checks	Kharif-2015	19	-	0.6	19	-	13.5
	Kharif-2016	23	-	25.0	23	-	7.6
	Kharif-2017	23	-	35.6	23	-	54.2
	Weighted Mean	-	-	12.6	-	-	18.6
Frequency in the top three group (pooled for three years)		-	3/3	-	-	2/3	-

Table.2a Reaction to major maize diseases (Peninsular Zone (PZ)) (Mean data)

Disease Name	Condition	Item	GAYMH-1	National check HM-4
CLS	Natural	Kharif-2015	-	-
		Kharif-2016	-	-
		Kharif-2017	-	-
	Artificial	Kharif-2015	-	-
		Kharif-2016	MR	R
		Kharif-2017	-	-
C.RUST	Natural	Kharif-2015	-	-
		Kharif-2016	-	-
		Kharif-2017	-	-
	Artificial	Kharif-2015	MS	MR
		Kharif-2016	MR	S
		Kharif-2017	MS	MS
TLB	Natural	Kharif-2015	-	-
		Kharif-2016	-	-
		Kharif-2017	-	-
	Artificial	Kharif-2015	MS	S
		Kharif-2016	S	MS
		Kharif-2017	MS	MR

Table.2b Reaction to major maize diseases (Central West Zone (CWZ)) (Mean data)

Name of proposed hybrid : GAYMH-1				
Disease Name	Condition	Item	GAYMH-1	National check HM-4
C.ROT	Natural	Kharif-2015	-	-
		Kharif-2016	-	-
		Kharif-2017	-	-
	Artificial	Kharif-2015	-	-
		Kharif-2016	MR	R
		Kharif-2017	-	-
RDM	Natural	Kharif-2015	-	-
		Kharif-2016	-	-
		Kharif-2017	-	-
	Artificial	Kharif-2015	-	-
		Kharif-2016	MR	MS
		Kharif-2017	MR	R
CLS	Natural	Kharif-2015	-	-
		Kharif-2016	-	-
		Kharif-2017	-	-
	Artificial	Kharif-2015	-	-
		Kharif-2016	MR	R
		Kharif-2017	R	R

Table.3 Reaction to Insects-Pests in different locations (Mean data)

Insect Name	Condition	Item	Peninsular Zone (PZ)		Central West Zone (CWZ)	
			GAYMH-1	National checks HM-4	GAYMH-1	National check HM-4
<i>Chillo Partellus</i>	Natural	Kharif-2015	-	-	-	-
		Kharif-2016	-	-	-	-
		Kharif-2017	-	-	-	-
	Artificial	Kharif-2015	MR	S	MR	HR
		Kharif-2016	MR	MR	MR	MR
		Kharif-2017	MR	MR	MR	MR

Table.4 Data on Quality Characteristics

Quality characteristics	GAYMH-1	Local Check 3 (GM-2)
Moisture %	87.25	86.20
Total Carbohydrate %	3.62	6.20
Total Soluble Sugar %	1.82	2.52
Reducing Sugar %	1.52	1.34
Non-Reducing Sugar %	0.30	1.18
Vit C (mg/100gm)	15.05	14.15

Table.5 Other important traits (mean of locations in respective zone)

Characters	Item	Peninsular Zone (PZ)		Central West Zone (CWZ)	
		GAYMH-1	National check HM-4	GAYMH-1	National check HM-4
Plant height	Kharif-2015	188.9	177.7	167.2	163.4
	Kharif-2016	190.7	178.4	167.3	168.4
	Kharif-2017	184.9	182.4	186.9	172.2
Average		188.2	179.5	173.8	168.0
Ear height	Kharif-2015	-	-	77.4	75.8
	Kharif-2016	99.1	85.8	73.0	71.6
	Kharif-2017	86.4	86.9	84.0	74.5
Average		92.8	86.4	78.1	74.0
Days to 50 % silking	Kharif-2015	48.0	54.7	54.0	56.7
	Kharif-2016	53.7	55.0	55.2	54.5
	Kharif-2017	53.3	55.6	54.8	60.0
Average		51.7	55.1	54.7	57.1
Length of baby corn	Kharif-2015	9.7	9.1	7.3	7.7
	Kharif-2016	9.8	9.2	9.1	9.9
	Kharif-2017	9.5	9.0	7.3	7.6
Average		9.7	9.1	7.9	8.4

For earliness of cob emergence, this hybrid may take 51.7 days and 54.8 days in PZ and CWZ, respectively.

In both the zones it is found earlier than the best check, HM-4 (table-5). On an average, the baby corns are harvested within 55-70 days by taking five pickings at three to four days interval. In PZ, the first baby corn emerged at 51.7 days and 54.7 days in CWZ.

Maximum four to five pickings of baby corn can be harvested. The study rendered that baby corn pickings was completed by 70 days i.e. within 2 months 10 days, thereby rendering land free for next crop production. Having a crop of maize as baby corn has proved very remunerative Basu *et al.*, (2009). High yielding, baby corn hybrid GAYMH-1 is identified for kharif cultivation in PZ (Peninsular Zone) comprising the state of

Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana and CWZ (Central West Zone) comprising the state of Rajasthan, Madhya Pradesh, Chhattisgarh, Gujarat. It produces baby corn yield of 1436 kg/ha and 2296 kg/ha in PZ and CWZ, respectively. Being a high yielder, it will be more suited to farmers as a cash crop. Therefore, it is preferable baby corn hybrid that fulfil the requirements of farmers of Gujarat and other adjoining state also. The produce of it is of high quality and fetch high price from the market. The produce will be prefer by farmers, consumers, hotels and canning industries as well.

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