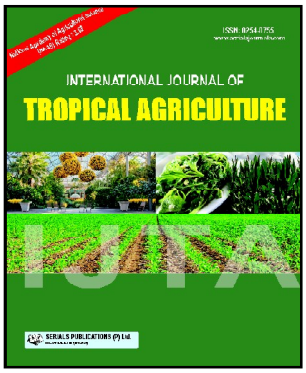

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Promising New garlic variety for higher yield- Yamuna Safed-8

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Abstract: Among the spices grown in India, garlic is undoubtedly one of the important crops after onion and propagated vegetatively and has good export potential as fresh bulb as well as in the form of dehydrated product. It is highly placed for its flavor enhancing capacity and has higher nutritive values than other bulbous crops. Garlic Yamuna Safed-8 (G-384) developed through clonal selection by National Horticultural Research and development Foundation for tropical and sub-tropical condition. The variety is short day type, which is notified by Ministry of Agriculture, Government of India, wide notification number of S. O. 268 (E) dated 28/01/2015 for Zone II (Jammu, Ludhiana, Delhi, Karnal, Hissar and Durgapura) and has become popular among farmers due to higher yield, better adoptability, suitable for processing and export due to attractive white colour bulbs. This variety was tested at different agro-climatic condition and recorded highest average yield (119.42 q/ha) followed by G-282 (91.57 q/ha), which is about 33.57 %, 23.31 % and 24.90 % higher than the checks variety G-41, G-282 and G-189, respectively. The storage data revealed that the lowest average loss (14.50 %) was recorded in (G-384) and which was lowest 2.70 %, 13.49 % and 1.22 % by checks G-41, G-282 and G-189.

Key words: *Allium sativum*, cultivar, garlic, performance

INTRODUCTION

Allium sativum L, commonly known as garlic, is a species in the onion genus (*Allium*), which is a large and diverse one containing over 1,250 species. It is a versatile horticultural commodity consumed for culinary, medicinal and antimicrobial purposes and is being cultivated since 5000 years (Mathew 1996 and Woodward 1996). The aroma in garlic is due to presence of volatile organo-sulfur compound known as *allicin*. It is highly placed for its flavor enhancing

capacity (Roy and Chakraborti, 2002) and has higher nutritive values other than bulbous crops and can also be used for preparation of pickle (Pandey and Singh, 1987). India is second largest garlic producer in the world. The public sector breeding has led to the release of approximately 20-25 varieties but the productivity is still low as compared to other countries. Main reason of low productivity remains that garlic is predominantly grown as a short day crop in India. Garlic is frost dwelling plant requiring cool and moist environment for growth phase and relatively dry period and high temperature during maturity of bulbs. The total production of garlic is 12.91 lakh tonnes from the area of 2.44 lakh hectares in the country during 2015. However, the productivity of garlic is 5.29 tonnes/ha in the country which is quite low.

Among 140 countries where garlic is grown, China is world leader in production (80.92%), followed by India (4.45%). Per hectare productivity of garlic is the highest in Egypt (25.17 t/ha) followed by China (24.56 t/ha), U.S.A. (15.04 t/ha), Republic of Korea (14.05 t/ha), Ethiopia (11.33 t/ha), Brazil (10.69 t/ha), Peru (10.52 t/ha), Turkey (9.24 t/ha), Spain (9.23 t/ha), Iran (9.05 t/ha), Russian Federation (8.47 t/ha), Ukraine (8.18 t/ha), Argentina (7.97 t/ha), Myanmar (7.26 t/ha), India (5.43 t/ha) and Bangladesh (4.98 t/ha).

Lack of high yielding and better storage varieties of garlic are main constraints limiting the production and productivity. To meet out the domestic as well as export requirement, selection of suitable genotypes for growing under different agro climatic condition and better shelf life is required. In this chain National Horticultural Research and Development Foundation has recently developed a new garlic variety namely Yamuna Safed-8 (G-384) which is notified by Government of India, wide notification number of S. O. 268 (E) dated 28/01/2015. This variety evaluated in All India Network Research on Onion and Garlic (AINRPOG) under ICAR in different agro-climatic zones of India and found performing superior over checks. The variety has been recommended for **Zone II** (Jammu, Ludhiana, Delhi, Karnal, Hissar and Durgapura).

ORIGIN AND DESCRIPTION

Develop through clonal selection by National Horticultural Research and development Foundation, materials collected from Jaunpur Uttar Pradesh and purified and maintained at Karnal, Haryana and fixing as Yamuna Safed-8. This variety has become popular among farmers due to higher yield, suitable for processing and export due to attractive, white colour bulbs.

The plant growth habit is good, dark green and erect leaves. Plant height 80-95 cm and number of leaves varies from 8-10. Bulbs are attractive, white colour and big sized (4.5-5.0) cm in diameter. Diameter of cloves are 1.00-1.40 cm, and number of cloves 22-30 per bulb. Total soluble solid and dry matter content is about 41-42% and 42-43%, respectively. Mature in 160-170 days and keeping quality is good and suitable for table and processing purpose. Average yield is about 17-20 tonnes/ha. It is tolerant to major disease of garlic like purple blotch, stemphylium blight and environmental stress conditions of garlic.

RESULTS AND DISCUSSIONS

The data presented in table-1 revealed that the entry G-384 tested at six locations *viz.*-Hissar, Durgapura, New Delhi, Karnal, Jammu and Ludhiana in IET 2010-11 in multilocational trials with other entries and checks. The average yield revealed that the performance of G-384 was adjudged best and recorded (101.07 q/ha), which is about 40.83 %, 21.01% and 3.43% higher than the checks variety G-41, G-282 and local check, respectively. This entry is tested under AVT-I at different agro-climatic condition in 2011-12 (table 2) at five locations *i.e.* Durgapura, Hissar, Jammu, Karnal, and Ludhiana

and average yield was recorded highest (119.42 q/ha) in entry G-384 followed by G-282 (91.57 q/ha), which is about 33.57 %, 23.31 % and 24.90 % higher than the checks variety G-41, G-282 and G-189, respectively. The storage data of 2011-12 (table 3) revealed that to identify the good storage quality variety the storage set on four location *viz*.-New Delhi, Hissar, Jammu and Karnal and the lowest average loss (14.50 %) was recorded in entry G-384 and which was lowest of 2.70 %, 13.49 % and 1.22 % by checks G-41, G-282 and G-189, respectively. In third year 2012-13 again this entry G-384 was tested on six locations AVT-II *i.e.* New Delhi, Durgapura, Hissar, Jammu, Karnal, Ludhiana for yield and yield contributing traits and average yield was obtained highest (125.63 q/ha), which is about 28.99%, 36.95%, 20.52%, 9.83, 44.78, 20.38 and 12.27% higher than the other entries and checks variety NRCWG-3, NRCWG-4, Phule Baswant, G-324, G-41, G-282 and G-189, respectively. The storage data of 2012-13 (table 5) revealed that the storage set on three locations *viz*.-Durgapura, Hissar, and Jammu and the lowest average loss (12.11 %) was recorded in check G-189 followed by NRCWG-4 (12.51%), G-282 (12.52%) and entry G-384, and which was recorded lowest losses of 2.99 %, 1.88%, 0.17% and 0.75 % % by NRCWG-3, Phule Baswant, G-324 and G-41, respectively and highest loss of -1.83%, -1.82% and -2.23% by NRCWG-4, G-282 and G-189, respectively.

Table 1
Response of garlic entries at different locations in 2010-11 under ICAR, AINRPOG

Entries	*Hissar*	*Durgapura*	*New Delhi*	*Karnal*	*Jammu*	*Ludhiana*	*Average yield (q/ha)*	*% Increase yield in G-384 over checks*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
G-384	89.00	95.00	89.70	169.30	72.70	90.70	101.07	-
G-41 (C)	81.20	65.00	46.30	74.40	18.10	73.80	59.80	**40.83**
G-282 (C)	52.50	73.30	63.50	114.30	61.00	114.40	79.83	**21.01**
Local check	——	——	46.60	121.70	——	124.50	97.60	**3.43**
CD at 5%	15.10	9.00	1.90	15.30	22.50	4.90	-	**-**
CV (%)	8.60	7.20	17.00	11.10	7.30	1.50	-	**-**

Table 2
Response of garlic entries at different locations in 2011-12 under ICAR, AINRPOG

Entries	*Durgapura*	*Hissar*	*Jammu*	*Karnal*	*Ludhiana*	*Average yield*	*% Increase yield in G-384 over checks*
	1	*2*	*3*	*4*	*5*	*6*	*7*
G-384	85.60	123.00	115.00	181.75	91.75	119.42	-
G-41 (C)	87.20	101.40	50.50	111.48	46.09	79.334	**33.57**
G-282(C)	93.90	94.60	50.50	100.99	117.90	91.578	**23.31**
G-189 (C)	66.10	83.20	77.25	136.17	85.72	89.688	**24.90**
CD at 5%	14.18	36.00	17.90	16.75	——	-	**-**
CV %	11.13	8.42	11.99	6.47	——	-	**-**

Table 3
Weight loss performance of garlic entries at different locations in 2011-12 under ICAR, AINRPOG

Entries	*New Delhi*	*Hissar*	*Jammu*	*Karnal*	*Average loss (%)*	*% increase loss in other varieties over G-384*
	1	*2*	*3*	*4*	*5*	*6*
Duration	150 days	120 days	90 days	150 days	——	
G384	41.67	3.20	3.30	9.83	14.50	-
G-41 (C)	48.33	3.60	2.20	14.67	17.20	**2.70**
G-282 (C)	56.00	3.80	17.50	34.67	27.99	**13.49**
G-189 (C)	46.33	4.30	1.90	10.33	15.72	**1.22**
CD at 5%	——	0.50	——	2.69	**-**	**-**
CV %	——	6.80	——	9.92	**-**	**-**

Table 4
Yield response of garlic entries at different locations in 2012-13 under ICAR, AINRPOG

Entries	*New Delhi*	*Durgapura*	*Hissar*	*Jammu*	*Karnal*	*Ludhiana*	*Average yield*	*% Increase yield in G-384 over checks*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
G384	129.00	94.20	91.72	73.74	217.04	148.10	125.63	-
NRCWG-3	156.00	74.20	81.21	32.32	136.91	54.66	89.22	**28.99**
NRCWG-4	62.00	77.50	84.23	60.06	140.62	50.84	79.21	**36.95**
Phule Baswant	92.00	82.50	94.25	76.96	139.88	113.50	99.85	**20.52**
G-324	109.00	97.50	101.99	71.43	163.95	135.80	113.28	**9.83**
G-41 (C)	55.00	62.50	80.52	108.10	61.60	48.52	69.37	**44.78**
G-282 (C)	84.00	71.70	86.01	67.83	164.57	126.10	100.04	**20.38**
G-189 (C)	98.00	104.20	95.04	83.97	154.32	125.80	110.22	**12.27**
CD at 5%	——	14.18	2.45	30.90	——	13.12	-	**-**
CV %	——	10.03	11.12	30.13	——	——	-	**-**

Table 5
Weight loss performance of garlic entries at different locations in 2012-13 under ICAR, AINRPOG

Entries	*Durgapur*	*Hissar*	*Jammu*	*Average loss (%)*	*% increase loss in other varieties over G-384*
	1	*2*	*3*	*4*	*5*
G384	18.51	3.20	21.30	14.34	-
NRCWG-3	20.50	4.20	27.30	17.33	**2.99**
NRCWG-4	**15.84**	3.90	**17.80**	**12.51**	**-1.83**
Phule Baswant	16.06	**3.10**	29.50	16.22	**1.88**
G-324	19.43	3.90	20.20	14.51	**0.17**
G-41 (C)	22.98	3.80	18.50	15.09	**0.75**
G-282 (C)	17.95	4.00	15.60	12.52	**-1.82**
G-189 (C)	22.44	3.40	10.50	12.11	**-2.23**
CD at 5%	——	NS	——	-	**-**
CV %	——	9.00	——	-	**-**

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