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NEW H1 BUZAU F1 HYBRID OF EGGPLANT OBTAINED AT V.R.D.S. BUZĂU

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Abstract

The absence of local hybrids for greenhouses imposed starting an intensive breeding program at V.R.D.S. Buzau since 1996. The main purpose of the program is obtaining valuable hybrids which show strongly F1 heterosis. Through inter and intraspecific hybridization works in Solanum genus, besides disease resistance inheritance, valuable features can be obtained: genetical resistance at extreme weather, extremely high or low temperatures, water stress or salinity (Downey M.C.,1991). Obtaining productive hybrids with genetical resistance at Verticilium dahliae fungus allows the elimination or the decrease of chemical treatments which would lead to cost reduction and environmental pollution decrease (M. Tudor,1996). After evaluation and intensive breeding work with germplasm resource, it was obtained a number of 22 stable genitors. After general and specific combining ability were obtained a large number of hybrid combinations. L1 A and L1 S hybrid showed F1 superiority and phenotipical uniformity, obtaining H1 Buzau F1 hybrid in 2010. Comparative crops both from greenhouses and field revealed valuable genetical resource which demonstrated phenotipically reproductive and adaptive heterosis and also high productivity and ecological plasticity.

Key words: *breeding, heterosis, hybrid, genitor, germplasm.*

INTRODUCTION

Hybrid F1 eggplant seeds become a necessity, especially for glass crops. In our country, the lack of local hybrids at these species led to the purchase of foreign hybrids at very high prices and these did not meet the consumers and growers requirements. As a result, Breeding Laboratory from V.R.D.S. Buzau studied a research plan since 1996 which aimed obtaining F1 local hybrids at eggplant in competition with ones from prestigious brands. In the breeding works has been studied a valuable genetic material, adapted to our environmental conditions but it had not been neglected foreign genotypes which had shown important features.

MATERIALS AND METHODS

The research started in 1996 acquiring valuable genetical material for collection field. Germplasm resource contains over 60 important lines advanced breeded. After forming the collection field, it was evaluated with observation sheets and chromosomal map. After the evaluation the important material was transferred from the collection field to the work field where was intensively improved. Working field contains 22 valuable genitors which are part of the conservative selection plan. The main criteria which formed the base for choosing the material for collection and to transfer it in the working field were:

- genetical inheritance of the genitors which manifests clearly important phenotypical features
- genitors stability and uniformity expressed through decreased variability of the main characters and their progeny transfer
- genetical ability of the genitors to hybridization process, this aim being reached by testing combining general and specific ability

The 22 genitors that form the work field were crossed and were obtained a number of combinations in order to obtain reproductive, adaptive and metabolic heterosis. Hybrid combination which demonstrated clearly this phenomenon was realized between L 1 A and L 1 S genitors. It was used classical hybridization by female flowers castration and elimination of stamens before opening to avoid self pollinating.

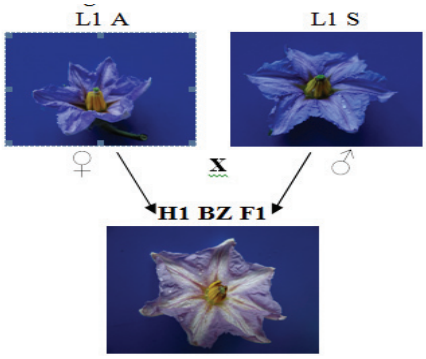

Figure 1. Hybridization

As novelty in hybridization process (Figure 1) was the implementation of a new technology method of pollen transfer from maternal to paternal genitor. This method was elaborated at V.R.D.S. Buzau and consists of using a liquid solution of water and sugar or honey mixed with patern pollen and then the flowers are sprayed bathing with this solution. This method has many advantages as:

-the liquid solution feeds and hydrate pollen grains giving them long life and resistance to drought.

- adding pollen grains to female flower is a softer action avoiding aggression and mutilation.

- sugar or honey are adherent so they are fixing the pollen grains to flower stigma avoiding pollen release.

-higher efficiency, secure and easer work in the hybridization process.

RESULTS AND DISCUSSIONS

The research undertaken at this species from 1996 since now had finished with valuable results:

-it was constituted and conservated a germplasm resource of which could be obtained new valuable creations

-were obtained 22 important genitors with high ability to create new varieties and hybrids

-the entire collected material was tested for general and specific combining ability and the results were saved on computer

-H1 Buzau F1 hybrid was obtained in 2010 which meets the main proposed objective.

H1 Buzau F1 hybrid was studied 3 years after the release in two crop systems: greenhouse without heat and in open field. Crop technology was the classical one for each system. To highlight the main parameters of the new hybrid, Aragon by Hazera, a top market hybrid was used as monitor.The main data from the both crop systems measured at genitors, new hybrid and monitor plants and fruits are presented in table nr. 1,2, 3 and 4:

Table 1. The main biometric data measured in greenhouse

Cultivar	Plant height (cm)	Shoot no.		Leaf no./plant		Habit	Plant diameter (cm)
		main	sec.	big	small		
L 1 A	200	3	8	32	36	erect	70
L 1 S	80	3	6	35	62	erect	65
H1 Bz F1	100	4	8	52	86	Globular	70
ARAGONF1 (MT)	92	4	8	48	68	globular	67

The registered values highlight the main characters distinctibility of the genitor, hybrid and monitor plants. In what concerns plant height, genitor L1 A range first followed by H1 Bz. In what concerns shoots number/plant, H 1 Bz came first followed by monitor. The big number of leafs, superior to genitors and monitor hybrid demonstrates that this plant manifest somatic heterosis which is an important feature for breeding. Altough genitors of the hybrid have erect habit, F1 hybrid resulted has an uniform globular shape resembling with the one of monitor. Plant diameter highlights increased vigor of the hybrid from both genitor and monitor.

Table 2. The main biometric data measured in field

Cultivar	Plant height (cm)	Shoot no.		Leaf no./plant		Habit	Plant diameter (cm)
		main	sec.	big	small		
L 1 A	118	3	6	24	22	erect	46
L 1 S	68	3	5	26	36	erect	40
H1 Bz F1	75	4	6	38	48	Globular	45
ARAGONF1 (MT)	71	4	5	32	41	globular	42

The values registered in field are significantly reduced at all studied parameters both at genitors and H1 Bz hybrid and monitor. The habit of the plant was not transformed in this environmental conditions.

Table 3. The main biometric data measured at fruits in greenhouse

Cultivar	Fruits no. /plant	Fruit weight (gr)	Fruit diameter (cm)			Fruit lenght (cm)	Fruit colour		Pulp consistency
			base	middle	top		outside	inside	
L1A	12	380	3.4	5.5	1.5	24	black	Yellow	Normal
L1 S	6	441	4.8	8.1	4	20	black	Yellow	Normal
H1 Bz F1	8	777	5.4	8.4	6	28	black	White	Fluffy
ARAGON F1 (MT)	8	628	4.8	7.2	5.1	26	black	White	Fluffy

Table no. 3 presents that the number of fruits per plant at H1 Bz hybrid represented an average of the genitors values but average weight was significantly higher than gemitors and monitor. The fruit shape could be reconstituted easily after the values concerning fruit base, middle and top shape, measurements which demonstrated H 1 Bz superiority. The inside and outside fruit colour and consistency shows that hybrid production is high quality and meets the present requirements of the consumers. (Figure 2).

Table 4. The main biometric data measured at fruits in field

Cultivar	Fruit weight (gr)	Fruit diameter (cm)			Fruit lenght (cm)	Fruit colour		Pulp consistency
		base	middle	top		outside	inside	
L1A	223	2.8	4.3	1.3	19	black	Yellowish white	Normal
L1 S	315	3.6	6.8	3.3	17	black	Yellowish white	Normal
H1 Bz F1	482	4.5	7.2	5.4	22	black	White	Fluffy
ARAGON F1 (MT)	420	3.9	6.6	4.6	21	black	White	Fluffy

Biometric measurements registered in the field shows that all studied cultivars presented significantly reduced values at all characters, only inside and outside colour and pulp consistency remaining unchanged. Even in this crop system, the new hybrid showed superiority both to the monitor and genitors.

Figure 2. Crop detail; fruit lenght and longitudinal section of fruit

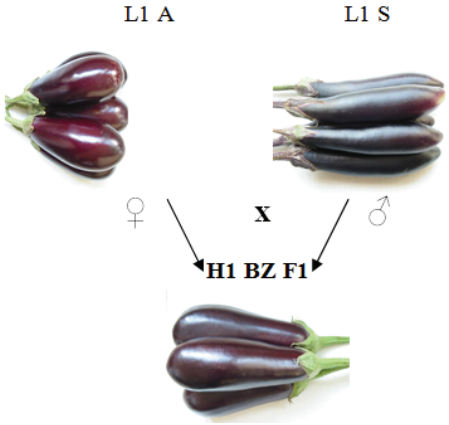

Figure 3. Hybridization (fruit group detail)

CONCLUSIONS

The registered values of H 1 Bz hybrid (Figure 3) in the two crop systems, both greenhouse and field, showed clearly reproductive and adaptive heterosis phenomenon objectified through yield significantly higher than genitors

but the fruit had a reduced number of seeds and the pulp is white and fluffy.

After testing for 3 years at V.R.D.S. Buzau and in other vegetable areas where the seed had been spread, they came to the conclusion that this new hybrid must be introduced widely for production replacing the missing varieties for greenhouse and field so it was registered and proposed starting with 2013 for patenting.

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