

T09.045
Identification of Maintainer and Male Sterile Lines within a Brazilian Onion Tropical Population
Santos, C. A. F.¹; Oliveira, V. R.²; Costa, N. D.³
¹EMBRAPA, CP 23, 56302-970, PETROLINA, PE, BRAZIL

²EMBRAPA HORTALIÇAS, C. POSTAL 218, 70359-970 BRASÍLIA -DF, BRAZIL

³EMBRAPA SEMI ÁRIDO, CP 23, PETROLINA, PE, BRAZIL

The semi-arid Brazilian regions of Pernambuco and Bahia States account for 18% of the national onion production, and the most important grown OPs were developed by the IPA. Two main reasons account for the large use of OPs in the region: 1. The price of hybrid onion seeds is four to five-fold the OP seeds, and 2. Many hybrids are susceptible to disease anthracnose caused by the fungi *Colletotrichum gloeosporioides*. We report the identification of maintainer and male-sterile onion lines within the Brazilian 'Baia Periforme' derived population, 'Alfa São Francisco', after three years of work, associating random field pairing of fertile plants with selected male-sterile plants and PCR-based marker system monitoring S, T and N-cytoplasm. Total DNA was isolated from onion leaf tissue according to the CTAB 2x protocol. Two independent PCRs were performed to publish onion primers to identify S, T and N-cytoplasm. Male-sterile plants produced flowers with light green anthers which were easily detected in the field. A frequency of 2.0% of male-sterile plants was estimated in the 'Alfa São Francisco' sampled population. Male-sterile plants produced the 5' cob-marker 180-bp and the orfA501-marker 473-bp fragments, suggesting the T-cytoplasm type, while the maintainer line produced only the 5' cob-marker 180-bp. These identified lines will be important to develop tropical onion hybrids well-adapted to Brazilian low latitudes and to future comparative studies with other onion CMS commercial systems.

T09.046
Studies and Researches Regarding the Action of the Heterosis Phenomenon in F1 and F2 for the Tomato Hybrids Obtained at V.R.D.S. Buzau - România
Vinatoru, C.¹; Neicu, E.¹; Glaman, G.²; Popescu, V.³
¹VEGETABLE RESEARCH-DEVELOPMENT STATION BUZĂU, MESTEAĞANULUI STREET, NO 23, 120024, BUZĂU, ROMANIA

²SECTION OF HORTICULTURE, ACADEMY OF AGRICULTURAL AND FORESTRY SCIENCES "GHEORGHE IONESCU-SISESTI" BUCHAREST, ROMANIA

³FACULTY OF HORTICULTURE, UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE BUCHAREST, ROMANIA

The amelioration of tomato at V.R.D.S. Buzău started since the establishment of the institution in 1957. In over 50 years of activity, here were accumulated a valuable germoplasma base for this species; now there are over 200 lines in an advanced amelioration stage. In order to correspond to actual requirements, in 1996 research works started in order to obtain high quality hybrids for this species. After 10 years of studies and researches concerning a great number of hybrid combinations made between the 200 selected genitors, in 2006 there were obtained the first significant results. There were obtained four hybrids named: H1Bz, H2Bz, H3Bz, H4Bz – hybrids that manifested the heterosis phenomenon (reproductive and adaptable). These hybrids were tested in greenhouses, solarium and open field obtaining superior results comparative to the genitors and the control variant for F1. The hybrid that manifested in the most pronounced way the heterosis phenomenon for F1 is H2Bz which surpassed the most valuable genitor with 36t/ha in greenhouse, 22t/ha in solarium and 12t/ha in open field. On the last place in what it concerns the heterosis phenomenon action in F1, was H3Bz that surpassed the most valuable genitor with 17,8t/ha in greenhouse, 12t/ha in solarium and 2,4t/ha in open field. Even if the results registered for H3Bz are smaller in F1 than the other hybrids studied, this one is placed in top in what it concerns the early crop; and in F2 the yield results are superior than the genitors and the other studied hybrids. In F2 H3Bz obtained a yield increase ~20% bigger than the yields obtained in F1 in all three culture medium. Considering the fact that during the experiment there was followed the determination of the hybrids natural yield potential, the level of the yield obtained was lower.

T09.047
Gaps in Vegetable Plants *ex situ* Collections Coverage as a Major Constraint to Use of Plant Genetic Resources in Breeding
Avagyan, A.; Hovhannisyan, L.

ARMENIAN STATE AGRARIAN UNIVERSITY, #74 TERYAN STR., 0069, YEREVAN, ARMENIA

The major changes in land use or agricultural practices, replacement of a diversity of landraces with few unified modern varieties causing genetic erosion of agricultural crops, and climate change threatening the food supply systems emphasize the importance of plant genetic resources for modern breeding programmes. The major needs in crop modeling and crop development for successful crop adaptation to climate change are focused on two aspects of global warming - extreme high temperatures and extreme low moisture conditions. This fact led to the necessity of development of new varieties of crops with high resistance to extreme hot and drought conditions. In this connection, crop wild relatives and landraces become more and more attractive for breeders since they are considered as donors of a number of useful traits, including heat and drought tolerance. The gap analysis of vegetable crops accessions in European *ex situ* collections has shown that the diversity of some vegetable plants is not fully represented. The extent of coverage vegetable crops diversity varies depending on crop species. For instance, the major gaps identified in existing *ex situ* collections of melons include wild relatives and landraces, which are of huge importance for new challenges facing crop breeding in light of climate change. The germplasm growing in farmers' fields and in nature, is continually genetically adapting to permanently changing environmental conditions and evolving novel genetic forms, that is why the *ex situ* collection should be replenished by all possible subspecies, varieties, eco-types of currently growing wild species. That will ensure conservation of entire gene pool of species and provide opportunities for effective utilization of plant genetic resources in breeding programmes aimed at climate adaptation through increasing crops varieties adaptability and resistance.

T09.200
New Synthesized Method for Citrus Chimera
Ishihara, Y.; Yin, N. Y.; Fukushima, Y.; Hirata, Y.

TOKYO UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, 3-5-8 SAIWAICHO, 183-8509, FUCHU, TOKYO, JAPAN

Citrus is mainly propagated by vegetative reproduction, such as cutting and grafting. (Yoshioka, 1967) By using grafting, the useful variety has been improved in some cases. There are chimeras that were produced by grafting by chance such as "Bizzaria orange" and "Kobayashi Mikan". (Kuhara 1989) Artificial chimeras are synthesizing as new chimera variety by grafting. However, how the interaction occurred between the different cells and tissues in those are not sufficiently clarified (Zhou *et al.* 2000). But, chimera is now utilizing in some citrus breeding in Japan. For research the interaction between the cells and tissues, we used Citrus chimera, NFF and FNN between "Kawano Natudaidai (*Citrus natudaidai* Hayata L. (N))" and "Fukuhara Orange (*Citrus sinensis* L. (F))". (Kuhara 1988) Our previous study made clear some specific characterization in chimeras, especially shape and components. We aim to efficiently obtain new chimera by synthesis for the tissue cultured chimera method. We focus on *in vitro* grafting and high improved new chimera synthesis. "DHS (Direct Hormone Slowly) Grafting" method was adopted in the present study. (Ohtsu 1994) This method has a higher percentage of synthesis of chimeras than the previous method. Thus we apply DHS grafting method as the "*in vitro* grafting method". (Hirata, 2009) The system will be presented in this meeting.

T09.201
New Horizon in Artificially Synthesized Chimeras in *Brassica* and *Fragaria*
Hirata, Y.; Nakagawa, M.; Ohta, S.; Noguchi, T.; Ohmine, A.

GRADUATE SCHOOL OF AGRICULTURE, TOKYO UNIVERSITY OF AGRICULTURE & TECHNOLOGY, 3-5-8 SAIWAICHO, 183-8509, TOKYO, JAPAN.

Recently citrus chimera cultivars have been produced by the combination of