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RESTORATION OF SEED FERTILITY IN ORDER TO RENEW THE SAMPLES OF VEGETABLE CROPS STORED IN THE GENE POOL

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Annotation
The article presents the results of the research carried out in order to update the samples of the tomato, eggplant, hot pepper, sweet pepper collection from the vegetable crops stored in the gene pool and restore seed fertility.

Keywords: gene pool, crop samples, seed fertility, genetic resources, population, genebank, seed, seedling.

Introduction

Plant genetic resources are the basis for creating a favorable environment and ensuring food security. Therefore, the most important international documents such as "Convention on Biological Diversity" and "Global Action Plan" have been adopted. It is necessary to comprehensively solve the issues of preservation, study and development of new methods of working with plant genetic resources.

Research Methods

Due to the variety of crops, studies were carried out according to the guidelines for each species. Since the work carried out on the gene pool has its own characteristics, it was developed in the institutes of plant genetic resources of foreign countries (Методика Государственного сортоиспытания сельскохозяйственных культур. М., Колос, 1975., Методические указания ВИР по изучению мировой коллекции перца. 1977.) instructions are used. To update the samples of each species collection, sowing of seeds was carried out at the optimal planting time. Propagation of seeds of cross-pollinated plants was carried out in separate places or in isolation cabins.

In the reproduction of the seeds of the collection samples, no selection was made, except for the removal of plants damaged by mechanical disturbances, diseases and pests, because according to the method, the population should be kept in its original form. In order to preserve all biotypes included in the population of cross-pollinated crop samples, their seeds were collected from at least 30-50 plants, depending on the crop and variety, during propagation.

Research Results

Agrotechnical activities were carried out in order to grow seedlings of tomato, eggplant, hot pepper, sweet pepper collection samples belonging to the tomato family from vegetable crops in a greenhouse. In 2021, 313 samples of regenerating vegetable crops, old seeds with low fertility were taken from the Institute's Genbank to restore their fertility and prepared for planting. Notes were made on the samples taken, field logs were prepared.

The following agrotechnical activities were carried out in the greenhouse for growing seedlings. In special racks, new soil was mixed with rotted manure and replanted. For seeding, the ground was leveled and piles were prepared for each sample.

The following agrotechnical activities were carried out to plant the collection samples of vegetables and rice crops in the open field. In the fall, the plowed areas were leveled, descaled, phosphoric fertilizers were applied at the rate of 100 kg of fertilizer per hectare, and 70 cm ditches and arrow ditches were taken. Irrigation was carried out before planting seedlings and during planting. Seedlings were planted in 70 x 30 cm plots in plots of 7 m^2 without return. After planting, it was watered and regular maintenance was carried out. Weeded, cultivated, fed, watered and tested 3 times for varietal purity.

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1 tables Restoration of seed fertility of vegetable crops collection samples (2019-2021)

Crop types	Number of samples							Those whose fertility has been restored (%)
	Years				The number of ungerminated	The number of low seed takers	The number of fertility recoveries	
	2019	2020	2021	Total				
Tomato - *Lycopersicon* sp.	209	220	178	607	-	-	607	100
Eggplant - *Solanum melongena*	31	28	53	112	-	-	112	100
Sweet pepper - *Capsicum* sp.	12	10	30	52	-	-	52	100
Hot pepper - *Capsicum* sp.	7	36	53	96	-	-	96	100
Green peas - *Pisum* sp.	1	-	-	1	-	-	10	100
Red cabbage - *Brassica oleraceae* convar. *capitata rubra*	10	-	-	10	-	-	10	100
Total:	***270***	***294***	***314***	***878***	**-**	**-**	***878***	***100***

Tomato (Lycopersion sp.). Tomatoes belonging to the family of tomatoes - 178 samples were taken from vegetable crops. Their seeds were planted in the greenhouse on March 17. Sown seeds germinated 10% on March 24, 75% on March 30. The germinated seeds were regularly watered and the required air temperature was maintained. Seedlings were thinned and left at a distance of 3-5 cm. Ready seedlings were planted on May 15 according to the scheme 70 x 30 x 1. The transition periods of the main phenological phases were determined in the tomato collection. The flowering phase was recorded on May 27. The flowering phase of evening cultivars began in mid-June. Phenological observations were made every 3 days for 75% flowering and 10% - 75% fruiting of collection samples. Physiological ripening of tomato samples occurred on August 1 in early varieties. Ripe fruits were collected and fermented in separate containers. Then the seeds were washed and dried in a cool place. Tomato fruits were picked every week to obtain quality and variety-specific seeds from the planted samples. The yield, number of fruits, and number of seed chambers were studied. The seed germination of 178 tomato samples was restored. The obtained seeds were cleaned in the laboratory and are being prepared for submission to the Genbank.

Eggplant (Solanum melongena). 53 samples of eggplant were taken, their seeds were planted in the greenhouse on March 9. Seeds sown on March 14th 10% germinated on March 30th 75%. The germinated seeds were regularly watered and the required air temperature was maintained. Seedlings were thinned and left at a distance of 3-5 cm. Ready seedlings were planted on May 13 according to the scheme 70 x 30 x 1. The transition periods of the main phenological phases in the eggplant collection were determined. The flowering phase was recorded on June 6. In late varieties, the

flowering phase began in the middle of July. Phenological observations of 75% flowering and 10% and 75% fruiting of collection samples were carried out every 3 days. Physiological ripening of eggplant samples was September 20 in early varieties. Each week, fully ripened eggplant fruits were selectively collected in separate containers. The yield, number and number of fruits collected from collection samples were studied. Seed germination of 53 samples of eggplant was restored. Then the seeds were washed and dried in a cool place. The obtained seeds are cleaned in the laboratory and are being prepared for submission to the Genbank.

Hot pepper (Capsicum annum). 53 samples of hot pepper were taken. Their seeds were planted in the greenhouse on March 9. Sown seeds germinated 10% on March 18, 75% on April 3. The germinated seeds were regularly watered and the required air temperature was maintained. Seedlings were thinned and left at a distance of 3-5 cm. Ready seedlings were planted on May 19 according to the 70 x 30 x 1 scheme. The transition periods of the main phenological phases in hot pepper collection were determined. The flowering phase was recorded on June 10. Phenological observations of 75% flowering and 10% - 75% fruiting of collection samples were carried out every 3 days. Physiological ripening of hot pepper samples occurred on September 15 in early varieties. Each week, fully ripened hot pepper fruits were selectively collected into separate containers. The yield, the number of fruits, and the number of fruits collected from the samples of the collection were studied. Then the seeds were separated from the flesh and the selected seeds were placed in specially prepared gray bags and dried in cool places. Seed germination of 53 samples of hot pepper was restored. The obtained seeds are cleaned in the laboratory and are being prepared for submission to the Genbank.

Sweet pepper (Capsicum anuum). 30 samples of sweet pepper crop were taken, their seeds were planted in the greenhouse on March 9. Sown seeds germinated 10% on March 18, 75% on April 3. The germinated seeds were regularly watered and the required air temperature was maintained. Seedlings were thinned and left at a distance of 3-5 cm. Ready seedlings were planted on May 13 according to the scheme 70 x 30 x 1. The transition periods of the main phenological phases in the sweet pepper collection were determined. The flowering phase was recorded on June 10. Phenological observations of 75% flowering and 10% - 75% fruiting of collection samples were carried out every 3 days. Physiological ripening of sweet pepper samples occurred on September 16 in early varieties. Each week, fully ripened sweet pepper fruits were selectively harvested into separate containers. The yield, the number of fruits, and the number of fruits collected from the samples of the collection were studied. Then the seeds were separated from the flesh and the selected seeds were

placed in specially prepared gray bags and dried in cool places. The obtained seeds are cleaned in laboratory conditions and prepared for submission to the Genbank.

Fertility of 314 samples of vegetable crops was restored, including tomato (Lycopersicon sp.) - 178, sweet pepper (Capsicum sp.) - 30, hot pepper (Capsicum sp.) - 53, eggplant (Solanum melongena) - 53 samples. This was 8 samples more than planned.

For three years, 878 samples of vegetable crops were obtained from the Seed Bank, planted in the field, cared for, recommended agrotechnical measures were implemented, and the seed germination of 878 samples was restored, including tomato (Lycopersicum sp.)- 607, sweet pepper (Capsicum sp.)- 52, hot pepper (Capsicum sp.) - 96, eggplant (Solanum melongena) - 112, green peas (Pisum sp.) - 1, red cabbage (Brassica oleraceae convar. capitata rubra) - 10 samples. The restoration of seed germination of green pea (Pisum sp.) and red cabbage (Brassica oleraceae convar. capitata rubra) samples from vegetable crops was carried out in 2020-2021. The number of samples of these types of crops in the seed bank of the institute is actually very small.

Conclusion

It is known that vegetable crops are mainly planted in the field with seedlings, and seedlings are grown in greenhouses. The seeds of the samples with low fertility are planted more densely in greenhouses and the required number of seedlings are prepared and the seeds are collected for depositing in the Seed Genbank. For this reason, the number of samples taken from the institute's gene bank and the number of samples whose fertility was restored was equal, and the fertility of 885 samples was restored to 100%.

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