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REPRESENTATIVES OF THE PLANT FAMILY ARECACEAE ARE SEED GERMINATION AND ADAPTABILITY TO SHARPLY CONTINENTAL CLIMATES

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Abstract: This study aimed to investigate the adaptation of the Arecaceae family, Trachycarpus fortunei, Trachycarpus vagnerianus, Jubaea chilensis and Washingtonia robusta species to the harsh and continental climate conditions. The results of the study provided insight into the competition and germination rates of these palms in harsh climate conditions.

Keywords: Arecaceae, palm species, seed germination, continental climate, adaptation

Introduction.

The palmadosh family (Arecaceae) has a worldwide distribution, being mostly common in tropical and subtropical regions. However, some representatives can also adapt to harsh continental climates. Among others, species such as Trachycarpus fortunei, Trachycarpus wagnerianus, Jubaea chilensis and Washingtonia robusta are of interest in terms of frost resistance and seed germination. This article analyzes the flexibility characteristics of the species of these palms.

Methods

The following techniques were used during the study:

1.Seed germination assessment-the seeds of each species were collected, and their germination was observed in laboratory conditions under different humidity and temperature conditions.

2.Climate Adaptability Test-plants are planted in natural conditions, their frost resistance level and vegetation status were observed.

3.Statistical analysis-the results were processed using mathematical and statistical methods and conclusions were drawn on the flexibility of each species.

Further sections cover research results and conclusions

Table 1.

Trachycarpusturinio's measles (for 90 days)

Species name	The amount of seed planted	The average seed weight is.	Seed size	Time of planting	The time when it went to sprout	Seed planting depth	Number of sprouts (in%)	Plant growth rate in CM
Trachcarpus	7	0,24 gramm	0,8 - 1,2 cm	21.03.2023	32-36 days	0,5 -1 cm	3 (43 %)	5-5.81 cm
						1 - 1,5 cm	5 (71%)	5,12-8.3 cm
						1,5 - 2 cm	2 (29%)	5,1- 5,5 cm

A representative of the palmadosh family, the trachycarpus seed (Table 1) was planted in 3 different variants at a depth of 0.5 – 1 cm, 1 – 1.5 cm, 1.5 – 2 cm. In the course of studies, according to the results of observations, the highest rate of germination was observed in seeds planted to a depth of 1 – 1.5 cm. The tensile state achieved a result above 70%.

Figure 4. Monitoring and analysis of seed germination and development dynamics of growth of The Washington type (for 90 days)

Species name	The amount of seed planted	The average seed weight is.	Seed size	Time of planting	The time when it went to sprout	Seed planting depth	Number of sprouts (in%)	Plant growth rate in CM
Washington	7	0,09 gramm	0,7 1 cm	21.03.2023	45-50 days	0,5–1 cm	2 (28%)	3-3.3 cm
						1-1,5 cm	3 (42%)	3,1 - 3,8 cm
						1.5-2 cm	2 (28%)	2,9-3,1cm

Figure 5. The process of morphological observation of some of the representatives of the palm

Washington seeds, a representative of the plant family arecaceae , were planted on the canvas at a depth of 3 different options (Table 2).Planting depth 0.5 – 1 cm, 1.0 – 1.5 cm, 1.5 – 2.0 cm according to the results of observations of the experiment, we can see a more effective result in the germination (42%) and growth dynamics (3.1 – 3.8 cm) in palm seeds planted to a depth of 2 options(0.5 – 1 cm and 1.5 – 2).

We can also see a more effective result in 1.3 (0.5 – 1 cm and 1.5 – 2) options compared to 2 options(1-1.5 cm) in germination(42 %) and growth dynamics (3.1-3.8 cm) in palm seeds planted to a depth.

Table 3.

Phoenix (Phoenix canariensis) species growth dynamics(over 90 days)

Species name	The amount of seed planted	The average seed weight is.	Seed size	Time of planting	The time when it went to sprout	Seed planting depth	Number of sprouts (in%)	Plant growth rate in CM
Phoenix canariensis	7	0,75-1 gramm	2,7-3.5 cm	21.03.2023	18-23 days	1,0-1,5cm	5(71 %)	4,9- 5,3 cm
						1,5-2 cm	6 (86 %)	5,2 – 6,5 cm
						2 – 2,5 cm	4(57 %)	4,7 - 5,1 cm

An other representative of the palmadosh family is Fenik (phoenix canariensis), when sown in 3 different variants (Table 3), the germination of seeds sown to a depth of 1.5-2.0 CM was achieved by a slightly higher rate of 86% compared to those of other variants. The germination of a different sign of Phoenix from other species was found to be somewhat premature when compared to other species

Table 4

Growth dynamics of the Canarian (Jubaea chilensis) species (over 90 days)

Species name	The amount of seed planted	The average seed weight is.	Seed size	Time of planting	The time it went to sprout	Seed planting depth	Number of sprouts (in%)	Plant growth rate in CM
Jubaea chilensis	7	0,3 gramm	1,4 2 cm	21.03.2023	29-36 days	1-1,3 cm	4(57 %)	8,5-15 cm
						1,5-2 cm	6(86 %)	18- 24 cm
						2-2,5 cm	5(71 %)	16-20 cm

It was observed that even the Canarian (jubaea chilensis) seed from the palmadosh Family (Table 4), when planted in 3 different variants, the optimal selected depth is 1.5-2 cm for us. In this, the germination rate of the seed was 86%.

It was observed that the most optimal selected depth for us is 1.5-2 cm when sowing seeds of the Chamerops (chamaerops) type, which are representatives of the palmadosh family, also in 3 different variants (Table 5). In this, the germination rate of the seed was 86%

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Table 5

Dynamics of growth of the species chamerops (Chamaerops) (for 90 days).

Species name	The amount of seed planted	The average seed weight is.	Seed size	Time of planting	The time when it went to sprout	Seed planting depth	Number of sprouts (in%)	Plant growth rate in CM
Chamaerop	7	0,6 gramm	1,8 2,2 cm	21.03.2023	31-37 days	1-1,5 cm	4 (57 %)	18-24 cm
						1,5-2 cm	6 (36%)	21 -26 cm
						2-2,5 cm	5(71 %)	15-22 cm

Another representative of the family showed a relatively more effective result (57%) of seeds planted on the Earth's surface even with low-spread butya (butia) seeds sown in 3 different variants (Table 6), 0.5 – 1.0 cm, 1.0 – 1.5 cm, 1.5 – 2.0 CM, the closest 0.5 cm to the Earth's surface regardless of seed size.

Table 6

Dynamics of growth of the species Butya (Butia) (for 90 days)

Species name	The amount of seed planted	The average seed weight is.	Seed size	Time of planting	The time when it went to sprout	Seed planting depth	Number of sprouts (in%)	Plant growth rate in CM
Butia	7	**0,67 gramm**	**2.0 2,4 cm**	**21.03.2023**	**50-56 days**	**0,5-1 cm**	**4 (57 %)**	**3-5,5 cm**
						1-1,5 cm	**3 (33 %)**	**3- 4,5 cm**
						1,5-2 cm	**1 (14 %)**	**2,4 - 2,5 cm**

Conclusion

Of the representatives of the palmadosh family, Canaries (jubaea chilensis), Chamerops (chamaerops) and Phoenix (phoenix canariensis) in laboratory conditions, we can observe in the table that the most effective result of germination is achieved when planting a depth of 1.5-2.0 CM in the canvas. Trachycarpus, one of the representatives of this family, as well as Washington seeds, observed that seeds 1.0-1.5 cm deep showed a satisfactory result when they were observed to be germinated. The representative of the palmadoshs in Butya showed the result that we did not expect in terms of germination of seeds planted in the depth of the ground to a size of 0.5 cm. Because, in terms of size and weight of seeds of this species (for example, one grain of Palmadosh Butya species has an average weight of 0.67 grams, the volume is in the range of 2.0 – 2.4 cm), the palmadosh family is large in size and weight is greater than the seeds of other species we have used in our experiment.

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