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STUDIES UPON THE PHONOLOGY OF ROSIE DE ARIES ONION PLANTS FROM THE FIRST YEAR OF THE SEEDS PRODUCTION PROCESS AND THE MAIN CHARACTERISTICS OF THE PARENT PLANTS FROM 2007 UNTIL 2009 YEAR

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Abstract

The research was carried out in the period of 2007-2009 year, in the environmental conditions of SCDL Iernut. This spanned the duration of vegetation phases of plans from the experimental variants, since Ist year-parent plant phase, in three eras of sowing. The vegetation period of the parent plants (emergence- bulb maturity) was, as average on this three years of study, of: 125 days in the Ist age (1751^{o}C), 110 days in the IInd age (1821 ^{o}C) and 106 days in the IIIrd age (2130 ^{o}C). The studied characteristics were: weight of the bulb, the longitudinal diameter, the transversal diameter, the shape index and the height of the plant.

Key words: *phenological dates, important characteristics of the bulb.*

INTRODUCTION

The area of origin and the spread of *Allium* genus on globe and also the phenotypic variability of characteristics for adaptability to the bulb to different environmental conditions.
Through the process of improvement and selection, experts have created valuable varieties and hybrids of onion.
Knowledge of the specific requirements of growth and development of each cultivar determines the development of specific production technologies.
This paper represents a sequence of study plant requirements of Rosie de Iernut red onion for the phases of growth and development in the environmental conditions of SCDL Iernut.

MATERIALS AND METHODS

The investigations were carried out on three biological cycles "from seed to seed".
The experiences were organized into four rehearsals and three epochs (ages).
The biological material used for the obtaining of the parent plants bulbs was made from the seed of the author, the Rosie de Iernut variety.
Have been studied the vegetation phases and phenophases, having as main objective the duration of phenophases in correlation with the amount of accumulated temperature on phenophases and the influence of some important characteristics of the biological material (bulbs – parent plants).
During the periods of experience for producing the bulbs-parent plant (Ist year) have been carried out specific maintenance work. Have been carried out observations and biometric measurements for the selection of biological material, where were made also the biological purification as special works in production of the biological material for the multiplication of a cultivar.
In the laboratory, after harvesting the bulbs have made observations and biometrical measurements for choice, selection of biological material typical for the variety. The biometric calculations were established selection parameters using confidence intervals of the varietal characteristics of the variety, thus eliminating ± the variants.

RESULTS AND DISCUSSIONS

The important stages of the experiences of producing bulbs were: sowing, emergence, commencement of the bulb (figure 1), the deeply bulb formation and bulb harvesting.

The studied phenophases (table 1), as duration (table 2, figure 2) and the sum of the degrees of temperature on phenophases (table 2, figure 3), accounted the periods between phases and the length of the growing season was represented by the period between plant emergence and plant harvesting.

Figure 1. Rosie de Aries variety

Table 1. The vegetation phenophases of the mother plants of Rosie de Aries onion variety, on sowing ages– the average on 3 years

Phenophase	Period		
	Ist age	IInd age	IIIrd age
Sowing-emergence	26.03-20.04	15.04-29.04	01.05-10.05
Emergence-bulb formation	20.04-10.06	29.04-05.06	10.05-11.06
Bulb formation-maturity consumer	10.06-10.08	05.06-02.08	11.06-10.08
Maturity consumer-harvesting	10.08-23.08	02.08-17.08	10.08-24.08
Vegetation period	26.03-23.08	15.04-17.08	01.05-24.08

The plant emergence had after: 25 days (141°C) during the Ist age, 15 days (112°C) during the IInd age and after 10 days (171°C) during the IIIrd age.

The commencement of the bulb formation had been manifested from the emergence as follows: 47 days (527°C) during the Ist age, 37 days (543^{o}C) during IInd age and after 32 days (585°C) in the IIIrd age.

The maturity consumer, the average on three years, was recorded in approximately 62 days (880°C) in the Ist age, 58 days (982°C) during IInd age and after 60 days (1262^{o}C) in the IIIrd age, from the commencement of the bulb.

Table 2. The length of phenophases and the amount of accumulated temperature degrees/phenophase, on sowing ages

Phenophase	Ist age		IInd age		IIIrd age	
	Period (Days)	^{o}C	Period (Days)	^{o}C	Period (Days)	^{o}C
Sowing-emergence	25	141	15	112	10	171
Emergence-bulb formation	47	527	37	543	32	585
Bulb formation-maturity consumer	62	880	58	982	60	1262
Maturity consumer-harvesting	16	344	15	296	14	283
Sowing-harvesting	150	1892	125	1933	116	2301

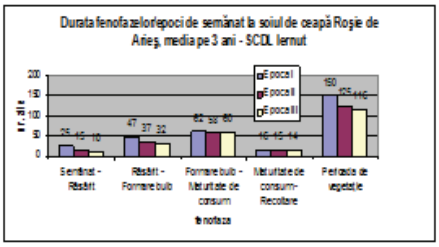

Figure 2. The length of phenophases/ages of sowing to the Rosie de Aries onion variety, the average on 3 years- SCDL Iernut

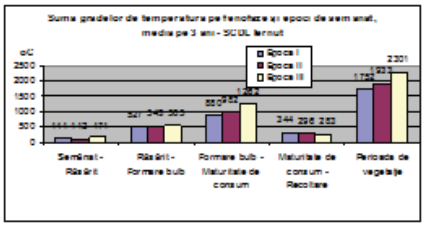

Figure 3. The amount of temperature degrees on phenophases and ages of sowing, the average on 3 years- SCDL Iernut

The harvesting of the bulbs was carried out after an average of 16 days (344°C) during the Ist age, 15 days (296°C) during the IInd age and after 14 days (283°C) in the third age, from the bulbs maturation.

During the growing season, the three-year average, it took 125 days (1751^{o}C) in the Ist age, 110 days (1821^{o}C) during the IInd age and after 106 days (2130^{o}C) in the IIIrd age.

The average of accumulated temperature' degrees (°C) /day regarding the phenophases growth and the mother plants development of Rosie de Aries variety on seeding ages was manifested by increasing from the first age

until the second one and the greatest values were recorded during the III[rd] age (table 3, figure 3).

Table 3. The average of accumulated temperature degrees (°C) /day to the phenophases growth and the mother plant development of Rosie de Aries, the average on 3 years – SCDL Iernut

Phenophase	I[st] age	II[nd] age	III[rd] age	Mean
Sowing-Emergence	5,64	7,46	17,1	10,06
Emergence-Bulb formation	11,21	14,67	18,28	14,72
Bulb formation-Mature consumer	14,19	16,93	21,03	17,38
Mature consumer-Harvesting	21,5	19,73	20,21	20,48
Vegetation period	11,68	15,46	19,83	15,66

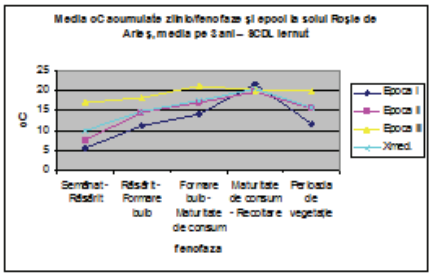

Figure 4. The°C average daily accumulated/phenophases and ages to Rosie de Aries variety, the average on 3 years – SCDL Iernut

The quantitative characteristics of onion bulbs were influenced by the temperature conditions during the growing season. There have been value differences between ages, in particular concerning the weight of bulb, bulb size (longitudinal diameter – ØL, transversal diameter – ØTr), and form index-IF.

In the I[st] age (table 4), the bulbs of the parent plant have been characterized through: the average weight of the bulb of 64.2 g, the index form (IF) - 0.88 and the plant height-56.8 cm.

In the II[nd] age (table 4), the bulbs of the parent plant have been characterized through: the average weight of 52,46 g, index form (IF) – 0.78 and the height of the plant – 56,12 cm.

In the III[rd] age (table 4), the bulbs of the parent plant have been characterized through: the average weight of the bulb-46 g, the index form (IF) - 0.62, the height of the plant – 48.2 cm.

Although the features: average weight of the bulb, the bulb-shaped index and the height of the plant have different values in different eras (ages), each of these characteristics were the same variability in all eras: the weight of the bulb has great variability in all eras, shape index recorded medium variability in all ages and the height of the plant has small variability in all ages (table 4).

Table 4. Variability indexes of the onion parent plant, the average (2007-2009), SCDL Iernut

Characteristic	Variability indexes					Variability
	x_{med}	s^2	s	$s_{\%}$	k	
I[st] age						
The weight of the bulb (g)	64,2	104,04	10,2	25	54-74,4	High
Form indexes	0,88	0,014	0,12	18,5	0,76-1,00	Medium
Height of parent plant (cm)	56,8	7,84	2,8	8,4	54-59,6	Small
II[nd] age						
The weight of the bulb (g)	52,46	345,96	18,6	30,08	33,8-71	High
Form indexes	0,78	0,02	0,14	10,0	0,6-0,9	Medium
Height of parent plant (cm)	56,12	11,62	3,41	12,65	52,7-59,5	Small
III[rd] age						
The weight of the bulb (g)	46	237,16	15,4	30,6	30,6-61,4	High
Form indexes	0,62	0,01	0,12	17,4	0,50-0,74	Medium
Height of parent plant (cm)	48,2	12,96	3,6	9,2	44,6-51,8	Small

CONCLUSIONS

During the phenophases - "sowing-emergence" and "emergence-bulb formation"-decreased the number of days since the I[st] epoch to the III[rd] age.

The phenophases - 'the beginning of the bulb formation-the maturity consumption' and 'the maturity consumption-harvesting' have almost the same period of days for all three ages.

The longest vegetative period was recorded in the Ist age and the shortest in the III[rd] age.

The average weight of the bulb decreases from the I[st] age to the III[rd] age, but records high variability in all ages.

The shape index tends to be almost unitary to the I[st] age dropping to the III[rd] age, recording middle variability to all ages.

The leaves' rosette of the plants recorded the largest height to the I[st] age and dropping down until the III[rd] age.

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