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THE INFLUENCE OF SELECTED FACTORS ON THE YIELD OF *Allium moly* L. BULBS

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Abstract. The effect of term of planting and size of bulbs on the yield of *Allium moly* bulbs was examined. Bulbs of circumference of 5–6 and 6–7 cm were planted in three terms: 29.09; 09.10 and 19.10.
It was stated that term of planting as well as size of bulbs have significant effect on number and weight of bulbs in the total yield and in the yield of the biggest bulbs (over 6 cm circumference). The optimal term of planting was 29.09, when the best results were obtained. Bulbs of circumference of 5–6 cm gave significantly bigger yield than those of 6–7 cm circumference in respect to quantity and weight.

Key words: *Allium moly*, term of planting, size of bulbs

INTRODUCTION

The interest in bulbous plants constantly increases what can be seen with the growing area of their cultivation [Hetman 1997]. Thus there is a need to continously improve technology of these plants production. Especially important agrotechnical factors which influence yielding of bulbous plants are term of planting and size of bulbs. On the basis of many years research their significant role in improving quality and size of bulbs was proved. The results obtained are confirmed by many experiments undertaken on *Muscari*, *Tulip*, *Gladiolus* and *Fritillaria imperialis* [Le Nard 1978, Cohat 1978, Dąbrowska and Żabińska 1978, Grabowska 1978, Szlachetka 1990, Laskowska 1999].

The aim of presented research was to determine the effect of term of planting and size of bulbs on *Allium moly* yield.

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MATERIAL AND METHODS

The research was undertaken in the Felin Experimental Station of the Agriculture University in Lublin in the years 2001–2003. The bulbs of *Allium moly* L. of the 5–6 and 6–7 cm in circumference were planted in three terms: 29.09, 09.10 and 19.10, on the depth of 7 cm. There were 45 bulbs planted in 1 m^2 plots. After harvest bulbs were dried, cleaned and sorted according to size sorts, starting with bigger than 6 cm in circumference to smaller than 4 cm in circumference. The weight and number of bulbs in the total yield as well as weight and number of bulbs in each size sort were determined. The obtained results were analysed statistically with the use of analyses of variance. The significance of differences was evaluated using the Tukey t-test at $\alpha = 0.05$.

RESULTS AND DISCUSSION

The term of planting had a significant effect on number of bulbs in the total yield. The highest yield in the means of the amount was obtained while planting bulbs in the earliest terms. Planting on 9th of October resulted in the highest number of bulbs – mean 195 per 1 m^2. The earlier term (29.09) gave slightly smaller amount of bulbs, but the difference was not significant. Definitely lowest amount of bulbs (165) was obtained from the last term (19.10).

The size of planted bulbs had also effect on their number in the total yield. The highest amount of bulbs was obtained while planting bulbs of 5–6 cm in circumference. Mean number of bulbs obtained in the total yield was 204 per 1 m^2 and was higher by 24.2% than the amount obtained while planting bulbs of bigger circumference (6–7 cm) (tab. 1).

Table 1. Number and weight of total yield bulbs
Tabela 1. Liczba i masa cebul plonu ogólnego

Term of planting Termin sadzenia (A)	Number of bulbs Liczba cebul size of bulbs wielkość cebul (B_1)		Mean Średnia (A_1)	Weight of bulbs Masa cebul size of bulbs wielkość cebul (B_2)		Mean Średnia (A_2)
	5–6 cm	6–7 cm		5–6 cm	6–7 cm	
29.09	211.2	170.0	190.6 A*	563.3	434.0	498.6 A
09.10	215.2	175.7	195.5 A	570.9	414.7	492.8 A
19.10	184.4	146.1	165.3 B	470.7	341.0	405.9 B
Mean Średnia (B)	203.6 A	163.9 B		535.0 A	396.6 B	

* Means followed by the same letter do not differ significantly at the level of 0.05
Średnie oznaczone ta samą literą nie różnią się istotnie przy poziomie $\alpha = 0{,}05$

The term of planting also influenced the weight of bulbs in the total yield. It was observed that planting bulbs of Allium moly in the earlierst terms (29.09 and 9.10) gives higher weight yield than planting in later one (19.10). The highest weight yield was

obtained from the first planting term (498.6 g). Slightly smaller value was obtained while planting bulbs on 9.X, and the smallest weight had bulbs planted in the latest term (405.9 g).

The size of bulbs had a significant effect on bulbs weight in the total yield as well. The highest value was obtained while planting, similarly to the amount yield, bulbs of 5–6 cm in circumference. The mean weight of these bulbs was almost by 35% higher than the weight obtained from bulbs of 6–7 cm in circumference (tab. 1).

The significant interaction between terms of planting and size of bulbs was not stated, with regards to neither amount nor weight. The tendency could only be observed that planting *Allium moly* bulbs of 5–6 cm in circumference in the second term (9.10) gives higher amount of bulbs and weight of total yield (tab. 1).

Evaluating the bulbs number of circumference of above 6 cm the significant differences were stated. The yield of *Allium moly* bulbs was the highest while planting them in two first terms: 29.09 and 9.10, with mean 63,6 bulbs were obtained from the first term and 60 bulbs per m^2 from the second one. The last planting term resulted in significantly lowest yield of bulbs (51 per 1 m^2).

The size of planted bulbs also had effect on yield of bulbs in the sort of bulbs of above 6 cm in circumference. Definitely the most bulbs were obtained while they were planted in the earliest term – 29.09 (321.2 g). The smallest weight yield had bulbs planted on 19.10 (243 g).

The circumference of planted bulbs influenced the weight of obtained bulbs as well. Significantly highest weight yield gave bulbs of 5–6 cm in circumference, with mean weight of 338.2 g. Planting bigger bulbs resulted in much lower yield which was only 235.6 g per 1 m^2.

The significant interaction between terms of planting and size of bulbs with accordance to the effect on number and weight yield was not observed. There was only a tendency to obtain higher number of bulbs and weight yield while planting bulbs of 5–6 cm in circumference in the first term (29.09) (tab. 2).

Table 2. Number and weight of bulbs of circumference over 6 cm
Tabela 2. Liczba i masa cebul o obwodzie powyżej 6 cm

Term of planting Termin sadzenia (A)	Number of bulbs Liczba cebul size of bulbs wielkość cebul (B_1)		Mean Średnia (A_1)	Weight of bulbs Masa cebul size of bulbs wielkość cebul (B_1)		Mean Średnia (A_2)
	5–6 cm	6–7		5–6	6–7	
29.09	71.1	56.2	63.6 A*	379.3	263.1	321.2 A
09.10	67.9	51.7	59.8 A	346.2	247.0	296.6 B
19.10	59.5	43.0	51.2 B	289.2	196.8	243.0 C
Mean Średnia (B)	66.1 A	50.3 B		338.2 A	235.6 B	

* Means followed by the same letter do not differ significantly
Średnie oznaczone ta samą literą nie różnią się istotnie

On the basis of obtained results the positive effect of earlier term of planting and size of bulbs on number and weight yield in the total yield and in the yield of bulbs of above 6 cm in circumference was stated. These results are confirmed by other authors. In the research of Grabowska [1978] (*Gladiolus*) and Szlachetka [1999] (*Fritillaria imperialis*) the earlier term of planting than usually applied resulted in higher number and weight yield of bulbs. Dąbrowska and Żabińska [1978] obtained similar results. They got lower total weight yield of bulbs while planting them in the later terms in comparison to the earlier planting. Szlachetka [1990] states that planting smaller bulbs of *Fritillaria imperialis* has a positive effect on yield. Similar results were obtained in the presented research, where planting *Allium moly* bulbs of smaller circumference (5–6 cm) resulted in higher number and weight of total yield of bulbs of above 6 cm in circumference.

CONCLUSIONS

1. The term of planting had a significant effect on number and weight of bulbs in the total yield and in the yield of bulbs of above 6 cm in circumference.
2. The optimal term of planting was 29th of September as the higher weight increase and the number of bulbs in the total yield and in the yield of bulbs of above 6 cm in circumference was obtained.
3. The lowest number and weight yield was obtained while planting bulbs on 19th of October.
4. The size of bulbs had a significant effect on number and weight yield of bulbs in the total yield and in the yield of bulbs of above 6 cm in circumference.
5. The higher number and weight of bulbs obtained in the total yield and in the sort of above 6 cm in circuference had bulbs obtained from bulbs of 5–6 cm in circumference.

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WPŁYW WYBRANYCH CZYNNIKÓW NA PLON CEBUL CZOSNKU ZŁOCISTEGO (*Allium moly* L.)

Streszczenie. Badano wpływ terminu sadzenia i wielkości cebul na plon cebul czosnku złocistego *(Allium moly* L.). W doświadczeniu wykorzystano cebule o obwodzie 5–6 cm i 6–7 cm, które posadzono w trzech terminach: 29.09; 09.10 i 19.10.
Stwierdzono, że zarówno termin sadzenia jak i wielkość cebul ma istotny wpływ na liczbę i masę cebul w plonie ogólnym i plonie cebul największych (powyżej 6 cm w obwodzie). Optymalnym terminem sadzenia okazał się termin 29 września, gdzie uzyskano najlepsze wyniki. Cebule o obwodzie 5–6 cm wydały istotnie większy plon, niż te o obwodzie 6–7 cm, zarówno pod względem ilościowym, jak i wagowym.

Słowa kluczowe: *Allium moly*, terminy sadzenia, wielkość cebul

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