ON THE IMPACT OF ROW DISTANCE AND OF SOWING DENSITY IN WHITE LUPIN (*LUPINUS ALBUS* L.)

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Abstract: *The beginning of the history of lupin cultivation in the old world is often associated with the times of the ancient Egyptian civilization . It is, however, more likely that originally white lupin was introduced into cultivation in ancient Grece where its greatest biodiversity was concentrated and wild-growing forms have been preserved until nowadays (ssp. graecus). Research carried out in the Gurahonț area, on a brown podzolit soil, using as genotype the white lupin (Lupinus albus L.) Medi cultivar, pointed out the possibility of producing over 2900 kg/ha. In the area investigated had a magnitude yields between 2100 kg / ha in variant sown at 25 cm distance between rows 30 germinabile/m^2 and 2940 kg grain / ha in variant sown at 75 cm distance between rows 50 germinabile/m^2 grains. Increasing row distance from 25 to 50 cm increased the yield with 18%, which corresponds to a difference of 520 kg / ha provided statistically as very significant. The highest yields were in the variant sowed at a row distance of 75 cm, i.e. 23% higher than the control. Among the tested sowing densities, the optimal one proved to be 50 germinating grains/m^2 yielding 9% more than the control variant, whose sowing distance was 30 germinating grains/m^2, that a difference of 230 kg / ha provided as distinct statistically significant. Lower requirements from the soil make possible its cultivation with very good results in hill areas with acid soils.*

Keywords: *white lupin, sowing technology*

INTRODUCTION

The grains of white lupin (*Lupinus albus* L.) lack alkaloids and they are particularly valuable due to the high content of proteins (35-37%) and fats (9-10%).

As far as sowing it is concerned, we need to mention that it is a good pre-emergent crop that enriches the soil in nitrogen, due to the symbiotic activities of bacteria specific to *Rhyzobium lupini*.

Lower requirements from the soil make possible its cultivation with very good results in hill areas with acid soils.

MATERIAL AND METHOD

The study was carried out in the hill area of the Arad County, at Gurahonț, on a brown podzolit.

The trials were bi-factorial, organised after the subdivided plot method with three replications, in which Factor A was represented by row distance with three graduations (a_1 – 25 cm; a_2 – 50 cm; a_3 – 75 cm) and Factor B was represented by the number of germinating grains per m^2 (b1 – 30 germinating grains/m^2; b_2 – 50 germinating grains/m^2; b_3 – 70 germinating grains/m^2).

The white lupin cultivar we used was Medi. Winter wheat was the pre-emergent crop.

The cultivation technology we used was the one specific to white lupin.

RESULTS AND DISCUSSION

The results we obtained ranged between 2100 kg/ha and 2940 kg/ha (Table 1).

Table 1.

White lupin yield depending on row distance and on sowing density

Factor A – Row distance (cm)	Factor B – Number of germinating grains/m^2			Averages of Factor A			
	30	50	70	Yield (kg/ha)	%	Difference (q/ha)	Significance
a_1 – 25 cm	2100	2350	2290	2240	100		
a_2 – 50 cm	2480	2800	2720	2660	118	420	XX
a_3 – 75 cm	2820	2940	2520	2760	123	520	XXX

DL 5% = 925 kg/ha, DL 1% = 1,274 kg/ha, DL 0.1% = 1,755 kg/ha

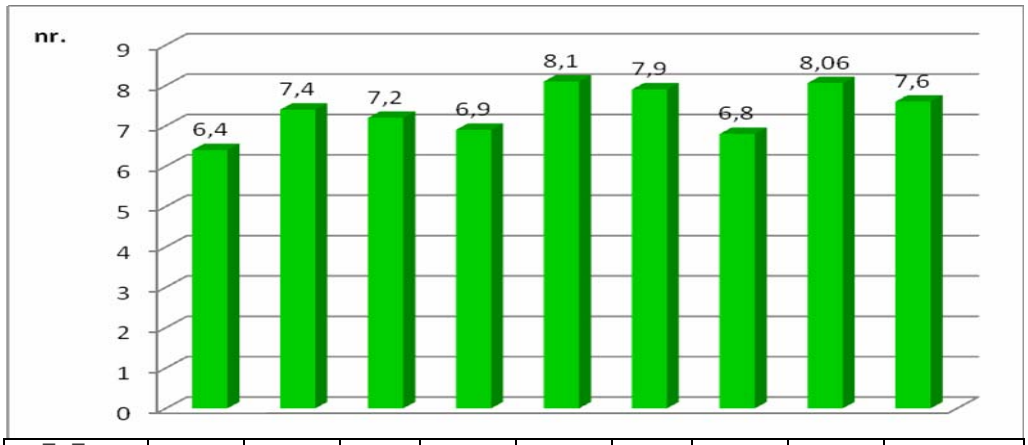
Averages of Factor B

Specification	30 germinating grains/m^2	50 germinating grains/m^2	70 germinating grains/m^2
Yield (kg/ha)	2460	2690	2510
%	100	109	102
Difference (kg/ha)		230	50
Significance		XX	

DL 5% = 146 kg/ha, DL 1% = 201 kg/ha, DL 0.1% = 277 kg/ha

The lowest yield was in the variant sowed at a row distance of 25 cm with 30 germinating grains/m^2, while the highest yield was in the variant sowed at a row distance of 75 cm with 50 germinating grains/m^2.

On the average for the sowing densities, increasing sowing density from 25 to 50 cm increased the yield with 18% (420 kg/ha) and increasing sowing density to 75 cm resulted in an increase in yield of 23% (520 kg/ha).



$\bar{X}$	6.4	7.4	7.2	6.9	8.10	7.9	6.8	8.06	7.6
cm	25			50			75		
g.g./m^2	30	50	70	30	50	70	30	50	70
S^2	1.64	1.04	1.16	1.29	0.89	0.69	0.76	0.60	1.04
S	1.28	1.02	1.08	1.14	0.94	0.83	0.87	0.76	1.02
Sx	0.13	0.10	0.11	0.11	0.09	0.08	0.09	0.08	0.10
S%	20.10	13.78	15.00	16.52	11.60	10.51	12.79	9.43	13.42

Figure 1. Evolution of the number of pods per plant depending on sowing distance

The sowing density of 30 germinating grains/m^2 was too low. Increasing sowing density of germinating grains per m^2 increased the yield with 9% (230 kg/ha). Increasing sowing density to 70 germinating grains/m^2 is not justifiable.

Figure 1 presents the evolution of the number of pods per plant depending on sowing distance.

This means that depending on the studied factors the number of pods per plant ranged between 6.4 and 8.1. The largest number of pods per plant was in the variant sowed at a sowing distance of 50 cm, with a sowing density of 50 germinating grains/m^2.

CONCLUSIONS

The Medi white lupin cultivar cultivated fro grains on a brown podzolit in the Gurahonț area yielded 2940 kg/ha for a sowing distance of 75 kg/ha compared to the variant whose sowing distance was 25 cm with an increase in yield of 23%.

Among sowing densities, to note the variant sowed with 50 germinating grains/m^2, in which the yield was 9% higher, i.e. 230 kg/ha more than the variant sowed with 30 germinating grains/m^2.

Increasing sowing density to 70 germinating grains/m^2 is not justifiable since the yield was sensibly closet o that in the variant sowed with 30 germinating grains/m^2, with a difference in yield with no significance at all.

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