

Suitability of Lamb Lettuce Cultivars for Spring and Autumn Growing

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Abstract

The yield and nutritional value of six Dutch and French cultivars of lamb lettuce, grown for early spring and autumn harvest were estimated in the greenhouse study conducted at Piastów Horticultural Research Station belonging to Agricultural University of Wrocław in 1998-1999.

Among cultivars tested, the highest marketable yield in spring (7-9 April) was obtained from Trophy (Clause) and Baval (Aveve) cultivars. Both these cultivars also showed a high suitability for autumn harvest, being out-performed only by Cirilla (Rijk Zwaan). Lamb lettuce harvested in the spring season contained higher amounts of vitamin C, potassium and nitrates. When grown in autumn, higher contents of dry matter, phosphorus and magnesium were obtained. The chemical composition of tested cultivars was variable depending on the length of the plant growing period.

INTRODUCTION

Lamb lettuce (*Valerianella locusta* L.), a cold season plant belonging to the Valerianaceae family is thought to be native to central Europe. As an annual, plants produce small rosettes of spatulate leaves 10-15 cm long, which are the edible parts of the crop, used mostly for salads. It is a quite popular vegetable in the Nantes region of France (Frankreich, 1998), and is also well known in some other West European countries such as Holland, Germany and Belgium. It may be produced both in the open field and in greenhouses, and harvested nearly all year round (Le Bohec, 1991; Benoit, 1995). In Poland it is still a minor vegetable grown mostly in home gardens for harvest during late autumn and winter season.

The advantages of this species are the short growing period of 60-90 days, low environmental requirements and high nutritional value of the crop. Previous analysis of lamb lettuce leaves for their food value showed the contents 6.6 % of dry matter, 1.8 % protein, 0.36 % fat, 1.4 % sugars, 1.5 % dietary fiber, 3.9 mg carotene, 35 mg vitamin C (Maly, 1998). It is also recognized as a rich source of potassium (420 mg/100 g of fresh matter), phosphorus (49 mg), calcium (35 mg) and iron (2 mg). The energy value is equal to 84 kJ per 100 g of fresh matter.

The aim of the present study was to evaluate the yield and nutritional value of six lamb lettuce cultivars grown in spring and autumn season.

MATERIAL AND METHODS

A greenhouse study was conducted at Piastów Horticultural Research Station in 1998-1999. The following Dutch and French lamb lettuce cultivars grown each year in spring and autumn season were included in the experiment: Vit (Nunhems Zaden), Cirilla (Rijk Zwaan), Monster (Enza Zaden), Gala and Trophy (Clause), Baval (Aveve).

Seed were sown on 17 February or 18 August in multicell trays, using 4 seeds for each cell (32 x 50 x 20 mm). After 4 weeks the seedlings were transplanted into plastic boxes in spacing 9 x 8 cm, which provided the population of 570 plants per 1 m². A mixture of clay soil and peat moss in ratio 1:1 by volume, supplied with 2 kg of

multicomponential fertilizer MIS-4 per 1m³, was used as the medium for transplants production and plant growing in plastic boxes. The experiment was established in a two factorial design, with four replications and a plot area of 1.5 m².

During the harvest conducted between 7-9 of April and 20-25 October, samples of leaves were collected for estimation of dry matter, vitamin C, sugars, N-NO₃ P, K, Ca and Mg contents. The harvest data were analysed by standard statistical procedures for a 2 factorial design and the least significant differences calculated by Tukey's test at $\alpha = 0.05$.

RESULTS

The results of the study showed (Table 1) that among tested cultivars the highest marketable yield, as the mean for two years and both growing periods (1.72 kg/m²) was provided by French cultivar Trophy characterized by large rosettes of wide spatulate leaves. This cultivar appeared to be the most suitable for early spring growing, and also produced high yield of leaves in the autumn season. The other valuable cultivar for early as well as late growing appeared to be Baval.

Lamb lettuce yield obtained in autumn was generally two-fold higher in comparison to spring growing. The maximum marketable yield equal to 2.45 kg/m² was produced by cv. Cirilla, creating medium size rosettes with short rounded in shape leaves. High yielding cultivars at this time were also Trophy (2.12 kg/m²) and Baval (2.14 kg/m²). The last mentioned cultivar differed greatly in appearance from the others because of the loose rosettes formed by long, narrow leaves.

Plants grown during the spring season contained higher (by 28 %) amounts of vitamin C, total sugars (18 %), potassium (13 %) and accumulated one fourth more of the nitrates in comparison to autumn growing (Table 2, 3). Delaying the plant growth to the autumn season contributed to a higher level of dry matter, magnesium and phosphorus contents. It is important to note that irrespective of the growing period, Baval and Cirilla cvs. showed the lowest tendency for accumulation of nitrates. The contents of the other compounds in tested cultivars were variable, depending on the length of the plant production period.

CONCLUSIONS

Among six tested cultivars of lamb lettuce the most suitable for early spring growing in the greenhouse production appeared to be Trophy and Baval, and for autumn harvest - Cirilla, Baval and Trophy. Plants harvested in the spring season contained higher levels of vitamin C, total sugars, K and nitrates, whilst for those grown in autumn there were higher levels of dry matter, P and Mg.

Literature Cited

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Tables

Table 1. The effect of the time of cultivation on yielding of tested lamb lettuce cultivars (kg/m²)

Cultivar	Period of growing		Mean
	spring	autumn	
Vit	0.91	1.97	1.44
Monster	0.91	1.91	1.41
Cirilla	0.83	2.45	1.64
Trophy	1.33	2.12	1.72
Gala	0.92	1.90	1.41
Baval	1.18	2.14	1.66
Mean	1.01	2.08	1.55

LSD $\alpha = 0.05$ for cultivar 0.21; time of growing 0.30; interaction n.s.

Table 2. The effect of the time of cultivation on dry matter, vitamin C and sugar contents in leaves of tested lamb lettuce cultivars

Cultivar	Period of growing							
	spring				autumn			
	dry matter %	vitamin C mg %	reducing sugars %	total sugars %	dry matter %	vitamin C mg %	reducing sugars %	total sugars %
Vit	10.50	56.1	0.85	1.36	13.45	56.0	0.88	1.15
Monster	10.00	70.4	1.05	1.30	10.91	47.8	0.65	0.99
Cirilla	10.00	78.4	0.90	1.20	13.22	45.6	0.98	1.10
Trophy	9.30	57.2	0.75	0.90	12.34	50.8	0.85	0.95
Gala	10.00	71.6	1.20	1.85	11.62	50.8	0.98	1.05
Baval	9.17	60.1	0.65	1.10	13.79	34.0	0.95	1.11
Mean	9.83	65.6	0.90	1.29	12.56	47.5	0.88	1.06

Table 3. The effect of the time of cultivation on N-NO₃, P, K, Ca and Mg contents in leaves of tested cultivars of lamb lettuce.

Cultivar	Period of Growing									
	Spring					Autumn				
	N-NO ₃ mg/kg d.m.	P %	K %	Mg %	Ca %	N-NO ₃ mg/kg d.m.	P %	K %	Mg %	Ca %
Vit	2 508	0.38	5.33	0.31	1.86	2 240	0.40	4.38	0.44	1.59
Monste	2 712	0.28	5.38	0.32	1.35	2 040	0.38	4.23	0.42	1.60
r	2 029	0.33	5.63	0.32	1.44	1 740	0.41	5.03	0.45	1.59
Cirilla	2 770	0.32	5.00	0.31	1.75	2 040	0.49	5.07	0.45	1.69
Trophy	2 513	0.35	6.88	0.34	1.28	2 260	0.47	5.65	0.45	1.58
Gala	2 360	0.40	5.00	0.32	2.15	1 260	0.40	4.50	0.41	1.75
Baval										
Mean	2 482	0.34	5.54	0.32	1.64	1 930	0.43	4.81	0.44	1.63