

Effect of cultivar on early yield of parsley grown from the late summer sowing

Robert Gruszecki

Department of Vegetable and Medicinal Plants
University of Agriculture in Lublin
Leszczyńskiego 58, 20-068 Lublin, Poland
e-mail: grusz@consus.ar.lublin.pl

Key words: winter hardiness, vernalization, bunching parsley

ABSTRACT

In the experiment conducted in 1999 – 2002 the usefulness of five rooted parsley cultivars from the late summer sowing (30th-31st August) on early crop was examined. The plants of 'Berlińska' wintered the best, yet this cultivar showed the lowest share of plants without inflorescence shoots. The highest percentage of plants without inflorescence shoots was found for cultivars 'Cukrowa' and 'Omega'. The largest total and marketable crop was collected from 'Lenka' cultivar.

INTRODUCTION

Parsley is a vegetable of which both leaves and roots are consumed. Some deficit of this vegetable is observed in spring. It results from low storage hardiness of parsley, as well as shooting into inflorescence of the plants wintering in the field.

Sowing the seeds in late summer of the previous year may be the solution of the problem. In Poland the studies on winter cultivation of such biennial vegetables as onion, cabbage and carrot were carried out (Kołota and Orłowski 1982, Matuszak 1997, Grudzień and Rumpel 2000). The studies of Jędras (1989, 1991) on 'seed to seed' method of rooted parsley seed production, showed that some plants did not produce generative shoots. They did not undergo vernalization and thus creating a possibility to cultivate parsley from late summer sowing.

The objective of the study was the evaluation of wintering, susceptibility to vernalization as well as yielding of rooted parsley cultivated for early harvest from late summer sowing.

MATERIAL AND METHODS

The experiment was performed in 1999 – 2002 at Experimental Station, the Agricultural University, Lublin-Felin, on fallow soil of mechanical composition of light soil, comprising 1.5% organic matter. The studies were carried out in a randomised block design in four replications. The seeds, 6 kg ha⁻¹, were sown on 30th-31st August in rows 0.3 m apart. The area of the plot was 3 m². The following cultivars of rooted parsley were studied: 'Berlińska PNE', 'Cukrowa', 'Lenka', 'Eagle', and 'Omega'.

In autumn before frost and in early spring the number of plants per 1 running meter was determined in order to evaluate the degree of wintering. The plants were harvested on 20th-21st June. The share of plants without inflorescence shoots was determined. Total yield was collected from non-vernalized plants. The marketable crop was selected according to norm – PN-R-75384 (1977). The obtained results were worked out statistically with the Tuckey t-test at p = 0.05 significance level.

RESULTS AND DISCUSSION

Weather conditions prevailing in winter affected significantly the degree of plant wintering (Table 1). Season 2001/02 was very suitable for parsley growing. The winter was cold, but without high temperature oscillation and spring began early. The autumn in 2000 was longer and warmer than in the other years of the study (Table 1). The plants before winter of 2000 were bigger (5-6 leaves) than in 1999 and 2001 (3-4 leaves), and many of them were vernalized. In season 2000/01 very high temperature oscillation was noted and many of the plants did not survive the winter. In the winter of 2000/01 only 32.9% of the plants survived, whereas in the winter of 1999/00 – 70.8% (Table 2). According to Jędras (1991), wintering of parsley plants may range from 0 to 90%, depending on the year. In the present study the plants of 'Berlińska' wintered the best (64.8%), and the plants of 'Lenka'

the worst (50.9%). This confirmed the results received by Jędras (1991), who found cultivar 'Berlińska' wintering better than 'Cukrowa' and 'Lenka' (Table 2).

Table 1. Meteorological data from the period of parsley growing in 1999–2002 (data from Department of Agrometeorology, University of Agriculture in Lublin)

Month	Mean daily air temperature (°C)			Precipitation (mm)		
	1999/00	2000/01	2001/02	1999/00	2000/01	2001/02
August	17.3	18.2	19.7	33.5	28.3	67.5
September	14.6	11.1	11.8	37.6	66.7	125.8
October	7.2	10.6	10.2	34.9	2.2	19.3
November	0.3	6.4	1.2	52.3	35.2	25.3
December	-1.0	1.6	-6.2	19.8	42.2	35.5
January	-3.4	-0.9	-1.6	26.9	29.2	35.6
February	0.2	-1.0	3.5	32.7	18.4	45.2
March	2.5	2.2	4.7	64.9	33.8	33.2
April	10.6	8.5	8.6	69.8	64.9	18.3
May	14.4	14.0	17.3	50.7	19.9	28.6
June	16.4	15.3	17.8	36.4	47.6	116.8

Table 2. The effect of cultivar on winter hardiness and vernalization of rooted parsley

Cultivar	Share of overwintered plants (%)				Share of non-vernalized plants (%)			
	1999/00	2000/01	2001/02	Mean	1999/00	2000/01	2001/02	Mean
'Berlińska'	74.8	41.2	78.3	64.8	24.1	6.3	43.6	24.6
'Cukrowa'	59.5	49.4	57.1	55.3	51.8	7.6	57.6	39.0
'Lenka'	70.2	19.0	63.4	50.9	22.5	19.2	57.9	33.2
'Eagle'	80.1	28.2	65.3	57.9	56.0	0.0	32.8	29.6
'Omega'	69.6	26.9	62.5	53.0	46.6	17.0	50.3	38.0
Mean	70.8	32.9	65.3	56.4	40.2	10.0	48.4	32.9
LSD _{0.05}								
cultivar	12.74	6.23	12.69	5.65	19.59	10.96	19.94	9.57
year				3.73				6.33
interaction				12.39				20.83

The response of cultivar to vernalization was significant. The most susceptible cultivar was 'Berlińska' (24.6%). The most resistant ones were 'Cukrowa' (39.0%) and 'Omega' (38.0%). According to Jędras (1991), the highest share of vernalized plants is characteristic for 'Berlińska', and the lowest for 'Cukrowa'. The author showed vast differences in the share of vernalized plants depending on the year. In the season of 1985/86, only 19.5% plants were vernalized, whereas in 1986/87 – 51.5%. It was confirmed in this study. In the season of 2000/01 only 10% plants

without inflorescence shoots were noted and in the season of 2001/02 – 48%. The share of plants without inflorescence shoots ranged differently depending on the year and cultivar. In the season 1999/00, the cultivar ‘Eagle’ was characterised by the highest percentage of non-vernalized plants. In the season of 2000/01 all plants of this cultivar produced inflorescence shoots.

The highest total and marketable crop of parsley plants (0.76 and 0.64 kg m⁻², respectively) as a mean of three years of studies was obtained from ‘Lenka’ (Table 3). The lowest total and marketable crop was collected from ‘Berlińska’. Great differentiation in yielding was noted with relation to the year of the studies. In the season of 2000/01, the mean total crop was only 0.10 kg m⁻², whereas in the season 2001/02 – 1.08 kg m⁻². It was caused by weather conditions, which affected the degree of wintering and vernalization of plants.

Table 3. The effect of cultivar on total and marketable yield of bunching rooted parsley

Cultivar	Total yield (kg m ⁻²)				Marketable yield (kg m ⁻²)			
	1999/00	2000/01	2001/02	Mean	1999/00	2000/01	2001/02	Mean
‘Berlińska’	0.15	0.09	0.68	0.31	0.11	0.09	0.57	0.26
‘Cukrowa’	0.46	0.04	1.07	0.52	0.39	0.04	0.86	0.43
‘Lenka’	0.15	0.30	1.83	0.76	0.13	0.28	1.51	0.64
‘Eagle’	0.39	0.00	0.67	0.35	0.36	0.00	0.60	0.32
‘Omega’	0.15	0.08	1.14	0.46	0.13	0.07	0.97	0.39
Mean	0.26	0.10	1.08	0.48	0.22	0.10	0.90	0.41
LSD _{0.05} for:								
cultivar	0.119	0.155	0.752	0.243	0.063	0.037	0.257	0.082
year				0.161				0.053
interaction				0.529				0.187

Marketable crop of roots and leaves differed significantly depending on the season of the studies. The highest marketable crop of roots and leaves was obtained in the season 2001/02 and the lowest in the season 2000/01 (Table 4). The highest marketable crop of roots (mean of three year studies) was obtained from ‘Lenka’ (0.28 kg m⁻²) and the differences were significant in relation to all cultivars (Table 4). The highest marketable crop of leaves was obtained from ‘Lenka’ (0.36 kg m⁻²). Significantly lower crop was obtained from ‘Berlińska’ and ‘Eagle’ (0.17 and 0.17 kg m⁻², respectively).

Table 4. The effect of cultivar on marketable yield of roots and leaves of rooted parsley

Cultivar	Marketable yield of roots (kg m ⁻²)				Marketable yield of leaves (kg m ⁻²)			
	1999/00	2000/01	2001/02	Mean	1999/00	2000/01	2001/02	Mean
'Berlińska'	0.03	0.03	0.21	0.09	0.08	0.06	0.36	0.17
'Cukrowa'	0.11	0.01	0.35	0.16	0.28	0.03	0.51	0.27
'Lenka'	0.04	0.07	0.73	0.28	0.09	0.21	0.78	0.36
'Eagle'	0.16	0.00	0.29	0.15	0.20	0.00	0.32	0.17
'Omega'	0.05	0.01	0.41	0.16	0.09	0.06	0.56	0.24
Mean	0.08	0.03	0.40	0.17	0.15	0.07	0.51	0.24
LSD _{0.05} for:								
cultivar	0.026	0.014	0.113	0.034	0.068	0.010	0.367	0.121
year				0.022				0.080
interaction				0.085				0.264

CONCLUSIONS

1. The best winter hardiness was characteristic for plants of cultivar 'Berlińska', on average from three years of the studies 64.8% plants of this cultivar survived the winter.
2. The lowest susceptibility to vernalization revealed 'Cukrowa' and 'Omega'.
3. The highest yield from late summer sowing was obtained from 'Lenka'.

REFERENCES

- GRUDZIEŃ K., RUMPEL J., 2000. Możliwość ozimej uprawy kapusty w świetle doświadczeń skierniewickich. *Ann. Univ. M. Curie- Skłodowska, Sect. EEE VIII*: 39-47.
- JĘDRAS L., 1989. Termin siewu pietruszki nasiennej przy uprawie bezwysadkowej. *Biul. Warz. Supl. II*: 67-70.
- JĘDRAS L., 1991. Wpływ terminu siewu na wysokość i jakość plonu nasion trzech odmian pietruszki uprawianej systemem bezwysadkowym. *Biul. Warz.* 37: 109-118.
- KOŁOTA E., ORŁOWSKI M., 1982. Możliwości uprawy marchwi z siewu wrześnieowego na zbiór wczesny. *Biul. Warz.* 26: 53-64.
- MATUSZAK W., 1997. Cebula zimująca – nowa jakość w hodowli cebuli. *Mat. Konf. VII Ogólnopolskiego Zjazdu Hod. Roślin Ogrod. "Hodowla, nasiennictwo i szkółkarstwo roślin ogrodniczych o podwyższonej jakości"*, Szczecin: 280-283.

PN-R-75384, 1997. Polska Norma. Warzywa w pęczkach. Wydawnictwo Normalizacyjne "ALFA-WERO", Warszawa.

WPŁYW ODMIANY PIETRUSZKI KORZENIOWEJ UPRAWIANEJ Z SIEWU PÓŹNOLETNIEGO NA PLON WCZESNY

Streszczenie: W doświadczeniu przeprowadzonym w latach 1999–2002 oceniano przydatność pięciu odmian pietruszki korzeniowej z siewu późnoletniego (30-31 sierpnia) na zbiór wczesny. Najlepiej zimowały rośliny odmiany 'Berlińska', w obrębie której stwierdzono największy udział roślin z pędami kwiatostanowymi. Natomiast najmniejszy udział roślin z pędami kwiatostanowymi stwierdzono u odmian 'Cukrowa' i 'Omega'. Największy plon ogółem i handlowy zebrano w przypadku odmiany 'Lenka'.

Received September 22, 2003; accepted October 26, 2004