EFFECT OF CELERIAC-LEEK INTERCROPPING ON WEEDS, INSECTS AND PLANT GROWTH

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Intercropping of field vegetables favours utilization of water, nutrients, cropping area and productivity of cultivated plants. At the same time it can reduce occurrence of weeds, deseares and insects (Baumann et al. 2000, Lamberts 1980, Wiech 1993). These advantegous effects are attributed partially to allelopathic interaction between cultivated plants and other organism living in the field (Oleszek et al. 2001). Cultivation requirements of celeriac and leek are similar and therefore they are suitable for intercropping (Sartorius 1993). The aim of this experiment was to compare plant growth and occurrence of weeds and insects in celeriac and leek cultivated in pure stand and in intercrop.

The studies were conducted in Lublin - Felin Experimental Farm. Experimental field was fertilized with potassium sulphate 100 kg $K_2O \cdot ha^{-1}$ and superphosphate 50 kg $P_2O_5 \cdot ha^{-1}$ in the autumn 2002 and with ammonium nitrate 50 kg ha^{-1} in the spring next year. On May 2003, 52 11-weeks old transplants of celeriac and leek were planted on one plot of pure stand cultivation in four rows with 50 cm distance between rows and 35 cm distance between plants in the row. In intercrop cultivation, the same number of celeriac and leek transplants was planted on one plot in eight rows with the same distances as before. One row of celeriac was planted alternating with one row of leek transplants. Length of the longest leaf of 30 celeriac and leek plants was measured every 10 days. Weeds were counted in 4 randomly placed 0,1 m^2 frames on each plot 4 weeks after planting. In the middle of August one yellow 17,5 cm x 24 cm catch plate covered with glue was placed on plot of each treatment for three days and then the caught insects were counted and determined by families. At the end of September the plants were harvested and total and marketable yields were measured. Moreover number of leaves, fresh weight of the whole plant, fresh weight and diameter of the edible part of 20 celeriac plants as well as the number of leaves, fresh weight of the whole plant and length and diameter of the edible part of 20 leek plants were measured immediately after harvest. Experiment was carried out in randomized block designe with four replications. Results were analyzed statistically and significance of differences were determined using Tukey's test at 0,05 probability level.

19 weed species grew in the experiment and the most numerous were: *Amaranthus retroflexus* (L.), *Capsella bursa-pastoris* ((L.) Med.), *Chenopodium album* (L.), *Echinochloa crus-galli* ((L.) P.B.), *Galinsoga parviflora* (Cav.), *Galinsoga quadriradiata* (Ruiz. et. Pav.), *Gnaphalium uliginosum* L., *Matricaria chamomilla* (L.), *Poa annua* (L.), *Stellaria media* (Vill.) and *Urtica urens* (L.). Method of cultivation did not influence the composition of weed flora nor the number and the fresh weight of weeds growing in the experiment (tab. 1). It had a distinct influence on total number of insects caught on trap plates and in this also on number of insects representing individual families (tab. 2).

Tab. 1. Number (no.·m^{-2}) and fresh weight (g·m^{-2}) of weeds grown in pure stand and in intercropping of celeriac and leek

Weeds	Pure stand		Intercropping celeriac : leek
	Celeriac	Leek	
Total number	1034	1009	859
Fresh weight	437.5	459.7	313.3
LSD 0.05	n.s.		

Tab. 2. Number of insects caught on tap plates in dependence on cultivation method of celeriac and leek

Order and family	Pure stand		Intercropping celeriac : leek
	Celeriac	Leek	
Homoptera			
Psyllidae	172	138	143
Aphidiadae	133	159	96
Diptera			
Anthomyidae	139	168	92
Sciaridae	69	120	67
Thysanoptera			
Thripidae	-	4	-
Heteroptera			
Miridae	15	-	-
Hymenoptera	3	-	-
Total	531	584	398

Length of the longest celeriac and leek leaves was measured 12 times during vegetation period and it was always slightly higher in intercrop cultivation, however these differences were not significant. Similarly the total and marketable yields of celeriac and leek were slightly higher in intercrop cultivation with the differences being insignificant (tab. 3). Celeriac plants cultivated in intercrop had significantly higher number of leaves, fresh weight of plant and fresh weight and diameter of edible part. The values of measured traits of leek plants were also higher but the differences were not significant.

Tab. 3. Yields of celeriac and leek in dependence on method of cultivation (in kg·are^{-1})

Method of cultivation	Celeriac			Leek		
	Whole plants	Total	Marketable	Whole plants	Total	Marketable
Pure stand	433.4	276.1	275.0	157.1	118.8	114.4
Intercropping	459.8	293.7	281.6	182.6	130.9	123.2
LSD 0.05	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

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