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EFFECT OF SOWING AND HARVEST DATE ON YIELDING IN SUMMER SAVORY (*SATUREJA HORTENSIS* L.) HERBAGE

Summary. The aim of the experiment was to determine the optimum sowing and harvesting time for obtaining high herbage yield of summer savory. Sowing in the field was carried out at four times: 7, 14, 21 and 28 April. The herb was harvested at three different developmental phases of the plant: at full flower bud formation period, at the beginning of flowering and in full flowering. The greatest fresh herbage mass yield was obtained from summer savory sown on 14 and 21 April. Variation in herbage yield also depended on the developmental stage at which summer savory was harvested. The highest and not showing significant differences fresh herbage mass yield was recorded for the plants harvested at the beginning of flowering and in full flowering.

Key words: summer savory, herbage yield, sowing and harvesting time

Introduction

Summer savory comes from the Mediterranean (Spain, Italy) and the Middle East (Iran) (SEFIDKON et AL. 2004). In the Middle Ages it was grown in monastery gardens as a well-known spice and medicinal plant. Apart from volatile oil the herb contains tannin, mucus, flavonoids and minerals such as calcium, potassium, magnesium, iron and zinc. The green leaves and herbaceous part of stems are used fresh and dried as flavouring agents in seasoning, stews, meat dishes, poultry, sausages and vegetables (MULAS 2006, PISTRICK 2006). Maximum increase of herb mass is observed until flowering period. Summer savory is a plant with a short vegetation period. Warm and sunny weather has a positive effect on greater plant mass formation. The aim of the experiment was to determine the optimum sowing and harvesting time for obtaining high herbage.

Material and methods

The field experiment was conducted in years 2004-2005 in the Research Station Marcelin on buff soil made from clay sand. Sowing in the field was carried out at four times: 7, 14, 21 and 28 April. 'Saturn' cultivar was used. It is a Polish cultivar with the average of fresh herbage yield 9 t/ha (SEIDLER-ŁOŻYKOWSKA and KAŹMIERCZAK 2005). The 'Saturn' cultivar is characterised by medium yield of crumbled herb mass compared to other European cultivars (HÉJJA et AL. 2002**)**.

Summer savory was sown in parallel rows 45 cm apart in the amount of 1 g/m^2. The experimental plot was 1.08 m^2 (1.20 m × 0.90 m). There were 50 plants in the experimental plot. The herb was harvested at three different developmental phases of the plant: at full flower bud formation period (I), at the beginning of flowering (II) and in full flowering (III). The herb was cut 8-10 cm above soil. Fresh and crumbled herbage mass was determined. The plant material was dried naturally in a drying room. When dry, it was crumbled. The experiments were carried out in random block system in four repetitions. The results were analysed statistically with Duncan's test at significance level $\alpha = 0.05$.

Results

Fresh herbage mass yield was dependent on sowing and harvesting time (Table 1). The highest fresh herbage mass yield in 2004 was recorded in plants sown on 14 and 21 April, and in 2005 the optimum time turned out to be 14 April. In 2004 the earliest of the sowing times, i.e. 7 April, did not have a significant influence on the yield, whereas in 2005 the yield from the plants sown at that time was low. The lowest fresh herbage mass yield in both years was recorded from the last sowing time, 28 April. Variation in herbage yield also depended on the developmental stage at which summer savory was harvested. The highest and not showing significant differences fresh herbage mass yield was recorded for the plants harvested at the beginning of flowering and in full flowering. The yield from the plants harvested at the beginning of flower bud formation period was much lower than from those harvested at the beginning of flowering and in full flowering. The results found in both years were similar.

Dry, crumbled herbage yield in 2004 was only slightly dependent on sowing time of summer savory. However, delaying sowing until 28 April resulted in much lower yield. In the second year of the study 14 and 21 April turned out to be the best sowing times in this respect. Dry crumbled herbage yield was higher when summer savory was harvested at the beginning of flowering and in full flowering than at the stage of flower bud formation.

Table 1. Effect of sowing and harvest date on fresh and crumbled herbage yield (kg/m^2)
Tabela 1. Wpływ terminu siewu i zbioru na plon ziela świeżego i otartego (kg/m^2)

Date of sowing	Date of harvest	Fresh herbage yield			Crumbled herbage yield		
		year of cultivation					
		2004	2005	mean	2004	2005	mean
7.04	I	1.78 b	1.58 bc	1.68 b	0.24 bc	0.24 c	0.24 bc
	II	1.86 b	1.62 bc	1.74 b	0.29 ab	0.26 bc	0.28 b
	III	1.80 b	1.56 bc	1.68 b	0.28 ab	0.26 bc	0.27 b
	mean	1.81 b	1.59 bc		0.27 bc	0.25 bc	
14.04	I	1.85 b	1.86 ab	1.86 ab	0.26 b	0.30 b	0.28 b
	II	2.08 a	2.15 a	2.11 a	0.32 a	0.36 a	0.34 a
	III	1.96 a	1.96 a	1.96 a	0.30 a	0.34 a	0.32 a
	mean	1.96 a	1.99 a		0.29 ab	0.33 a	
21.04	I	1.88 b	1.60 bc	1.74 b	0.28 ab	0.28 b	0.28 b
	II	2.06 a	1.82 b	1.94 b	0.34 a	0.36 a	0.35 a
	III	1.98 a	1.80 b	1.89 ab	0.34 a	0.35 a	0.35 a
	mean	1.97 a	1.74 b		0.32 a	0.33 a	
28.04	I	1.43 d	1.50 c	1.47 c	0.20 c	0.22 c	0.21 c
	II	1.68 bc	1.60 bc	1.64 b	0.24 bc	0.26 bc	0.25 b
	III	1.66 c	1.52 c	1.59 bc	0.24 bc	0.28 b	0.26 b
	mean	1.59 c	1.54 c		0.23 bc	0.26 bc	
Mean	I	1.74 b	1.64 bc		0.24 bc	0.26 bc	
	II	1.92 a	1.80 b		0.30 a	0.31 ab	
	III	1.85 b	1.71 b		0.29 ab	0.31 ab	

Values followed by the same letter in the same columns and in 2004 and 2005 years do not differ significantly at $\alpha = 0.05$.

Discussion

Numerous writers recommend different sowing times for summer savory, ranging from the end of March to the end of April (CYBULSKA et AL. 1956), in April (CHMIELIŃSKA 1963) or in April and May (CHOJNACKA and KRZEŚNIAK 2000). In the studies the best sowing times for obtaining high herbage yield were 14 and 21 April. Sowing at earlier times turned out to be less beneficial for receiving the same herbage mass proba-

bly due to less beneficial atmospheric conditions in the period of intensive growth of vegetative mass. These results are confirmed by the results obtained by MARTYNIAK-PRZYBYSZEWSKA and MAJKOWSKA-GADOMSKA (2006) who recorded the higher herbage yield in the case of seedlings planted later, i.e. on May 15. According to RUMIŃSKA (1981) summer savory is characterised by the greatest increase in herbage mass until the phase of flower bud formation.

Conclusions

1. The greatest fresh herbage mass yield was obtained from summer savory sown on 14 and 21 April.
2. The mass herbage was the greatest harvested at the beginning of flowering and in full flowering.

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WPŁYW TERMINU SIEWU I ZBIORU NA PLON ZIELA CZĄBRU OGRODOWEGO (*SATUREJA HORTENSIS* L.)

Streszczenie. Celem badań było określenie terminu siewu i zbioru ziela cząbru ogrodowego optymalnego dla uzyskania dużego plonu. Siew w pole wykonano w czterech terminach: 7, 14, 21 i 28 kwietnia. Zbiór ziela przeprowadzono w trzech różnych fazach rozwojowych roślin: w pełni tworzenia pąków kwiatowych, na początku kwitnienia i w pełni kwitnienia. Największy plon

świeżej masy ziela otrzymano z siewu 14 i 21 kwietnia. Zróżnicowanie wielkości plonu ziela wynikało również z fazy rozwojowej roślin, w której przeprowadzono zbiór. Największe i nie różniące się istotnie między sobą plony świeżej masy ziela uzyskano w przypadku zbiorów na początku lub w pełni kwitnienia roślin.

Słowa kluczowe: cząber ogrodowy, plon ziela, termin siewu i zbioru

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