

Effects of Sowing Amounts and Treatments on Agronomic Characteristics and Yield in *Schizonepeta tenuifolia* Briquet in Southern Part of Korea

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ABSTRACT

Performance of direct seeded upland field *Schizonepeta tenuifolia* Briquet in Southern areas of Korea was evaluated at different seeding methods(drilling and broadcasting) and seeding rates(1.5, 2.0, 3.0 and 3.5 ℓ /10a). There were no differences in the yield components such as length of stem and ear diameter of stem number of branch, internode and ear, and yield of fresh and dry stem between the seeding methods with drilling and broadcasting, but yield components such as length of stem and ear, diameter of stem, number of branch , internode and ear, and yield of fresh and dry stem increased with seeding rates of from 2.5 ℓ /10a to 3.5 ℓ /10a. Therefore potimum rates and methods of sowing were from 2.5 ℓ /10a to 3.5 ℓ /10a with seeding at the drilling and broadcasting

Key Words : *Schizonepeta tenuifolia*, Sowing amounts, methods, Yield.

INTRODUCTION

Schizonepeta tenuifolia is originated in China and is used in perspiration, removal of fever, detoxication, fever from influenza, swollen throat and hematemesis in herb medicine. It can be also cultivated in all areas of Korea and sandy loam with good condition of drainage is optimum to cultivate it. The optimum sowing period is early in April to the mid-June and it is sown by ridging 1.5 ~ 2.0m, evening and seeding on the whole ridge or by making furrow in the space of 20cm. Since the seed is very fine, it is sown with fine sand and then is covered with earth thinly. Seeding rate is 1 ℓ per 10a and it is germinated after 10 ~ 20 days. For the amount of fertilizer, 370kg of compost, 175kg of human

excrement and 37kg of Calcium superphosphate and plant ashes respectively per 10a are appropriate.

The variety sown in April is harvested in late in August and that sown in May is in September or October, that is, when it comes to fruition half, it is harvested, is dried in the sun, woven with straw and dried in the shade. The yield per 10a is dried medicinal herb and amounts to 480kg (Society of Medicinal Plant Research, 1980). Therefore, this study investigates the influence of the difference in seeding density and seeding rate of *Schizonepeta tenuifolia* at the south region on growth, development and quantity and reports some results of the research.

MATERIALS AND METHODS

Table 1. Mean values of performance characteristics of *Schzonepeta tenuifolia* under different seeding rate and seeding density.

Seeding density	Seeding rate (β§)	Emergency date	Flowering date
Drilling	1.5	Apr. 26	July 14
	2.0	27	16
	2.5	27	15
	3.0	26	15
	3.5	27	16
Broadcasting	1.5	Apr. 25	July 14
	2.0	25	15
	2.5	25	15
	3.0	27	14
	3.5	27	15

Table 2. Mean values and LSD's of agronomic characteristics of *Schzonepeta tenuifolia* under different seeding rate and seeding density.

Seeding density	Seeding rate (ℓ)	Stem length (cm)	No. of branches	Ear length (cm)	Diameter of stem (cm)	No. of internode	No. of ears
Drilling	1.5	83	9.4	38	2.7	9.4	10.0
	2.0	91	9.6	35	2.7	9.2	9.8
	2.5	92	9.8	41	2.1	9.7	10.8
	3.0	90	9.7	37	2.3	9.7	10.3
	3.5	92	7.7	35	2.2	9.7	15.5
Broadcasting	1.5	83	9.6	35	2.1	9.4	10.5
	2.0	89	9.2	35	2.2	9.4	9.8
	2.5	90	9.6	34	1.7	9.9	10.5
	3.0	89	9.8	39	2.3	10.3	11.1
	3.5	92	8.2	42	1.8	10.3	12.1
LSD (0.05)		2.77	1.39	5.17	0.57	1.04	10.33

Muan local variety is announced at experimental field of Mokpo Laboratory and it is sown in 10th Apr., 10 and the amount of fertilizer is 600kg of compost per 10a and N-P₂O₅-K₂O=5-10-20kg is used. Seeding density is divided into drilling and broadcasting and the seeding rate has five levels of 1.5, 2.0, 2.5, 3.0 and 3.5 ℓ per 10a for process and test.

RESULTS AND DISCUSSION

1. Flowering Date and Characteristics of Growth and Development

The change of flowering date and characteristics of growth and development according to seeding density

Table 3. Analysis of variance for agronomic characteristics of *Schizonepeta tenuifolia* under different seeding rate and seeding density.

Source of variation	df	Stem length (cm)	No. of branches	Ear length (cm)	Diameter of stem (cm)	No. of internode	No. of ears
Replication	2	3080.5333	1.2813	821.6333	0.0480	3.6053	1.3653
Seeding density	1	6.4000	0.1960	44.1000	0.7840	17.9560	0.1000
Error (a)	2	0.1333	0.0013	56.0333	0.0333	3.6053	0.4813
Seeding rate	4	5.9000**	6.2810**	20.0000*	0.3225**	14.8465**	61.0540**
Interaction	4	20.9000*	0.3960*	14.6000**	0.9650**	7.6185**	3.8450*
Error (b)	24	6.6666	0.1338	9.8333	0.0615	3.4695	2.7258

Table 4. Mean values and LSD's of yield characteristics of *Schizonepeta tenuifolia* under different seeding rate and seeding density.

Seeding density	Seeding rate (ℓ)	Yield (kg/10a)			Aridity ratio
		Fresh stem	Dry stem	Index	
Drilling	1.5	2,004.7	977.5	92	49
	2.0	2,061.4	1,059.6	100	51
	2.5	2,142.6	1,186.5	112	55
	3.0	2,024.7	1,097.4	104	54
	3.5	2,217.6	1,108.6	105	50
Broadcasting	1.5	1,864.7	857.9	81	46
	2.0	1,996.4	985.6	93	49
	2.5	2,000.0	1,030.6	97	52
	3.0	2,122.0	1,198.0	113	55
	3.5	2,187.6	1,203.7	114	
LSD (0.05)		179.01	188.76		

and rate of *Schizonepeta tenuifolia* are shown in Table 1. The period from emergence date to flowering date is 82~83days both in drilling and broadcasting and there are no great differences between seeding density and seeding rate.

There is no change of stem length in drilling and broadcasting as shown in Table 2, but there is a great difference in seeding rate and while it is 83cm in 1.5 ℓ, it is long in 2.0~3.5 ℓ as 89~92cm. The number of branches is small in seeding rate of 3.5 ℓ as 7.7~8.2

and is large in 1.5~3.0 ℓ as 9.2~9.8. In drilling, seeding rate of 2.5 ℓ per 10a has long ear length as 41cm, has short diameter as 2.1cm, 9.7 internodes and 10.8 ears. In broadcasting, 3.5 ℓ per 10a has long ear length as 42cm, 1.8cm of diameter, 10.3 internodes and 12.1 ears.

As a result of analysis of variance for these results, the significant difference is recognized in interaction among seeding density and seeding rate of drilling and broadcasting (Table 3).

Table 5. Analysis of variance for yield characteristics of *Schzonepeta tenuifolia* under different seeding rate and seeding density.

Source of variation	df	Yield (kg/10a)	
		Fresh stem	Dry stem
Replication	2	0.0000	463.1759
Seeding density	1	546.4659**	373.6161**
Error (a)	2	0.0000	0.0000
Seeding rate	4	329.5697	540.1333**
Interaction	4	170.0255	253.7207**
Error (b)	24	0.0000	0.0000

2. Yield

While 1.059.6kg/10a of dry stem is harvested at seeding rate of 2.0 ℓ of drilling, 1,186.5kg/10a is harvested in seeding rate of 2.5 ℓ and it is increased 12%, and in broadcasting of 3.5 ℓ seeding rate 1,203.7kg/10a is harvested and it is increased 14%(Table 4).

As a result of analysis of variance for these results, the significant difference is recognized and it is considered that the seeding rate of *Schizonepeta tenuifolia* is sown 2.5 ℓ in drilling and 3.5 ℓ in broadcasting(Table 5).

LITERATURE CITED

- Choi B. R., K. Y. Park and C. S. Kang. 1997. Effect of harvesting time on yield of Carthami Flos and grain in *Cathamus tinctoris* L. Korean J. Medicinal Crop Sci.5(3): 232-236.
- Choi B. R., K. Y. Park and S. W. Kang. 1998. Effect of plant age seed specific gravity of seed germination of *Bupleurum Falcatum* L. Korean J. Medicinal Crop Sci. 6(2): 154-159.
- Choi B. R., K. Y. Park. 1998. Effect of seed pretreatments on emergence, growth and yield of *Bupleurum falcatum* L. Korean J. Medicinal Crop Sci. 6(3): 216-220.
- Choi I. S. 1998. Effect of seedling ages on growth and yield of *Cynanchum wilfordii* Hemsly. Korean J. Medicinal Crop Sci. 6(2): 121-125.
- Choi S. H. 1999. Growth characteristics of *Acanthopanax sessiliflorus* seem seedling grown under different condition and seasons. Korean J. Medicinal Crop Sci. 7(1): 22-26.
- Choi S. K. 1998. Cutting propagation of *Dendropanax moribifera* LEV. Korean J. Medicinal Crop Sci. 6(4): 251-257.
- Kim S. Y. and K. C. Park. 1997. Comparison of chemical constituents of upland *Wasabia japonicum* Matsum grown by different propagation methods. Korean J. Medicinal Crop Sci. 5(4): 314-317.
- Kwon B. S. and J. T. Lim. 1997. Multivariate analysis of quantitative characteristics in *Alisma pantago* L. Korean J. Medicinal Crop Sci. 5(4): 260-265.
- Kwon B. S., G. C. Park. 1997. Effect of sowing time on dry root yield and agronomic traits of *Scutellaria baicalensis* Georg cultivated after barley. Korean J. Medicinal Crop Sci. 5(3): 202-205.
- Lee S. B., C. K. Sung, B. R. Sung, and D. H. Chung. 1993. Variation of essential oil components in stages and organs of *Schzonepeta tonuifolia* Briquet. Korean J. Crop Sci. 38(1): 55-59.
- Park G. C., B. S. Kwon and H. J. Park. 1997. Effect of Fertilizer levels on dry root yield in *Scutellaria baicalensis* cultivated after barley. Korean J. Medicinal Crop Sci. 5(4): 314-317.

Park I. H., S. R. Lee, and T. H. Chung. 1986.
Cultivation of medicinal plants. Sunjin Moonwhasa.
208-210pp.

Yi E. S., J. S. Lee and H. S. Lee. 1997. Effect of sowing
time and spacing on growth and yield of *Coix*

lachyma-jobi L. var. mayuen Stape. Korean J.
Medicinal Crop Sci. 5(3): 225-231.

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