

## Effects of Sowing Date on Growth and Yield of *Schizonepeta tenuifolia* Briquet in Southern Part of Korea

Hee-Jin Park and Byung-Sun Kwon<sup>1)</sup>

Seokang College Kwangju 500-742, Korea.

<sup>1)</sup>Dept. of Resources Plant Development, Sunchon Nat'l Univ. Sunchon 540-170, Korea

### ABSTRACT

This study was carried out to determine the effect of sowing time on the flowering, growth and yield of *Schizonepeta tenuifolia* Briquet. Emergence and flowering dates in the sowing time from March 30 to April 30 were earlier than those of the other sowing times. In the sowing time from March 30 to April 30, length and diameter of main stem, number of node per main stem, number of branch per plant and fresh, and dry weight of stem were greater than those of the other sowing times. Yield components such as ear length, main stem length and diameter, branches per plant, number of node and ears per plant, yield of stem in fresh and dry were the highest at the sowing time from March 30 to April 30. Optimum sowing time of *Schizonepeta tenuifolia* Briquet were shown to be from March 30 to April 30 in southern areas of Korea.

**Key Words :** *Schizonepeta tenuifolia*, Sowing date, Yield.

### INTRODUCTION

*Schizonepeta tenuifolia* Briquet(Labiatae) is the annual grass which belongs to honey grass from China. Its stem is within 1.0m, square-shaped, has the thick stand of fine hairs on the whole grass and its leaf is branched deeply into five in a form of leaf mustard, which have the linear form or lanceolate. Its blooms in early autumn on the stem as spica, has the reddish brown seed with the size of sesame seed and emits fragrance from the whole grass(Park et al, 1986).

Since medicinal plants which are the material of herb medicine are used to cure or prevent the diseases, the increase of its quantity for medicinal use is required, but the improvement cultural practice and raising of variety for increasing the contents of medicinal effect or maintaining the level of applied contents are more

important task.

Therefore, this study investigates the influence of the difference in sowing date of *Schizonepeta tenuifolia* at the south region on growth, development and quantity and reports some results of the research.

### MATERIALS AND METHODS

Muan local variety is announced at experimental field of Mokpo Laboratory and it is sown in 30 Mar., 10, 20 and 30 Apr., 10, 20 and 30 May and 10, 20 and 30 June with 25cm of spacing between rows and 15cm of seeding interval, and it has N-P205-K20=5-10-20kg/10a of fertilizer.

### RESULTS AND DISCUSSION

**Table 1.** Mean values of observed characteristics of *Schzonepeta tenuifolia* under different sowing date.

Sowing date	Emergence date	Flowering date
Mar. 30	Apr. 21	Jul. 15
Apr. 10	Apr. 29	Jul. 18
20	May 3	Jul. 25
30	May 12	Jul. 28
May 10	May 20	Aug. 14
20	Jun. 5	Aug. 21
30	Jun. 11	Aug. 25
Jun. 10	Jun. 26	Sep. 4
20	Jun. 29	Sep. 17
30	Jul. 18	Sep. 22

**Table 2.** Mean values and LSD's of agronomic characteristics of *Schzonepeta tenuifolia* under different sowing date.

Sowing date	Stem length	No. of branches (cm)	Ear length	Diameter of stem (cm)	No. of internode (cm)	No. of ears
Mar. 30	92	9.1	36	2.8	10.5	12.4
Apr. 10	88	8.1	49	2.8	11.4	8.6
20	87	8.7	43	2.8	11.4	8.6
30	81	8.8	43	2.8	11.4	8,8
May 10	88	7.4	46	2.6	10.2	9.0
20	82	8.1	42	2.8	9.2	7.4
30	79	6.2	33	2.6	9.0	7.7
Jun. 10	61	6.5	16	2.4	8.6	7.4
20	57	6.8	17	2.1	8.8	9.2
30	35	4.5	11	1.9	6.4	5.2
LSD(0.05)	2.51	2.51	24.34	0.62	3.35	3.19

**Table 3.** Regression equation and correlation coefficients between agronomic characteristics (Y) on the sowing dates (X).

Item	Regression equation	R-square
Stem length (cm)	$y = 88.0773 - 0.1498x$	0.6987
No. of branches	$y = 6.4703 - 0.0120x$	0.7324
Ear length (cm)	$y = 43.6751 - 0.1039x$	0.5779
Diameter of stem (cm)	$y = 2.9409 - 0.0027x$	0.6183
No. of internode	$y = 10.1214 - 0.0128x$	0.6955
No. of ears	$y = 7.0455 - 0.0131x$	0.5366

**Table 4.** Analysis of variance for agronomic characteristics of *Schizonepeta tenuifolia* under different sowing date.

Source of variation	df	Stem length (cm)	No. of branches	Ear length (cm)	Diameter of stem (cm)	No. of internode	No. of ears
Sowing date	9	10.0100	1.1264	5.7178	0.4101	7.9501	1.2717
Error	18	3.6444	0.1985	1.2629	0.0077	0.3721	0.5001
c. v. (%)		2.5521	5.7607	3.3798	3.4706	6.3318	8.3944

**Table 5.** Mean values and LSD's of yield characteristics of *Schizonepeta tenuifolia* under different sowing.

Sowing date	Yield (kg/10a)			Aridity	
	Fresh stem	Dry stem	Index ratio (%)		
Mar. 30		2,346.6	1,164.5	129	50.0
Apr. 10		2,150.1	1,191.2	132	55.0
20		2,190.3	1,150.0	127	53.0
30		2,107.0	1,111.9	123	53.0
May 10		2,045.2	903.8	100	44.0
20		2,056.6	752.3	83	37.0
30		2,029.3	720.8	80	36.0
Jun. 10		890.3	386.2	43	43.0
20		728.5	317.7	35	44.0
30		216.2	101.4	11	47.0
LSD (0.05)		1,327.68	693.61	-	11.57

### 1. Flowering Date and Characteristics of Growth and Development

The number of emergence of *Schizonepeta tenuifolia* by sowing dates and the change of its flowering dates are shown in Table 1. There is no difference from emergence date to sowing date as 73~87 days every sowing date, but the sowing date in the 30th of June is shorter as 64 days than that of the 30th March with 84 days. Change of stem length shows no difference till the sowing date before the 30th of May and at the later sowing date, it is shortened as 35~61cm and it is found that the same trend is shown in the number of branches, ear length, diameter of stem, number of internode and

number of ears (Table 2).

Linear regression analysis and analysis of variance for these results also recognize the significant difference by sowing dates (Table 3, 4).

### 2. Yield

The quantity of dry stem is increased by 23~32% more as the sowing date is faster while it is harvested with 903.8kg/10a as of the 10th May and especially it is increased 32% as 1,192.2kg/10a on sowing date, the 10th April (Table 5).

Linear regression analysis and analysis of variance for these results also recognize the significant difference

**Table 6.** Regression equation and correlation coefficients between yield characteristics (Y) on the sowing dates (X).

Item	Regression equation	R-square
Fresh stem yield (kg/10a)	$y=2150.90 - 33.7050x$	0.8342
Dry stem yield (kg/10a)	$y= 361.1993 - 5.4063x$	0.0073

**Table 7.** Analysis of variance for yield characteristics of *Schzonepeta tenuifolia* under different sowing date Item

Source of variation	df	Yield (kg/10a)	
		Fresh stem	Dry stem
Sowing date	9	1268.5167	237.9667
Error	18	21.0042	33.6776
C.V. (%)		27.4330	3.4603

by sowing dates and it is considered that the optimal time of sowing *Schzonepeta tenuifolia* is the mid-April (Table 6, 7).

#### 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 morbifera* 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 Stapf. Korean J.

Medicinal Crop Sci. 5(3): 225-231.

Received 2000.12.1

Accepted 2001. 2.1