

Growth and yield as seeding methods and Optimum time of harvesting for seed production using machine in winter oat

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objectives

To develop labor-saving culture using machine, it was investigated on growth and forage yield as oat seeding methods and harvest possibility and yield reduction rate in combine harvesting were also looked over.

Materials and methods

- variety : "Samhangwiri" ○ date and amount of seeding : Oct. 29, 15kg/10a
- amount of fertilizer : N-P₂O₅-K₂O=9-7-7kg/10a
- seeding methods
 - ridge drill seeding(using RS 126R, LG Co.)
 - partial tillage seeding(partial tillage seeding machine, Gyungil Co.)
 - ridge broadcasting(seeding on manual and 30cm drainage canal interval 150cm)
- harvesting times : 25, 30, 35, 40, 45 days after heading, respectively
- experiment location : Iksan, Jeollabuk-do
- harvesting machine : combine(KC575G-CP, 4 rows model)

Results

- Each seeding methods were not differ in growth and yield. There were no statistical significant in each methods, although seed yield was higher in ridge drill seeding.
- As harvesting time was late, moisture content of plants were trend to decrease. Although in 25 days after heading moisture content of panicles and the other part were 50.5% and 76.2% respectively, there was no problem to harvest using combine.
- As harvesting time was late, yields of seed had trend to increase all in manual and machine harvesting. It was the best especially in 40 days after heading. The decreasing rate of yield by machine was lowest in 40~50days after heading, then it was about 5%.
- It was suggested that oat for seed should be harvested by machine at 40 days after heading.

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Table 1. Forage yield as the mechanized seeding methods in winter oat

seeding methods	fresh		percentage of dry matter	dry matter	
	yield	index		yield	index
	(kg/10a)			(kg/10a)	
ridge drill	4,764 ^{NS}	100	21	1,000 ^{NS}	100
partial tillage	4,759	99	22	1,045	97
ridge broadcasting	4,678	98	21	982	99

Table 2. Seed yield and yield components as the mechanized seeding methods in winter oat

seeding methods	culm length (cm)	panicle length (cm)	No. of panicle per m ²	seeds per panicle	1,000 grain weight(g)	seed yield (kg/10a)
ridge drill	93	19.2	668	28	38.5	497 ^{NS}
partial tillage	91	18.7	671	26	38.2	486
ridge broadcasting	90	18.4	654	25	38.3	472

Table 3. Moisture contents of plant part and amounts of shattering as the harvesting times by combine in winter oat

harvesting times (days after heading)	moisture contents (%)		shattering tension (g)	No. of seeds shattered per m ²
	panicle	the other part		
25	50.5	76.2	274	131
30	43.7	76.1	201	142
35	37.5	73.7	187	107
40	26.5	65.6	123	98
45	18.7	61.3	90	109

Table 4. Seed yields of manual, machine harvesting and amounts of the loss as harvesting times in winter oat

harvesting times (days after heading)	yield by manual harvesting (kg/10a)	yield by machine harvesting (kg/10a)	amounts of the loss ^b (kg/10a)	loss ratio ^b (%)
25	340 d ¹	313 d	27	8
30	404 c	364 c	40	10
35	455 b	410 b	45	10
40	486 a	462 a	24	5
45	505 a	475 a	30	6

¹ DMRT(5%) ^b yield by manual harvesting - yield by machine harvesting

^b 100 - yield by machine harvesting / yield by manual harvesting × 100