DATE OF PLANTING OBSERVATION STUDY FOR GREAT BASIN WILDRYE, IDAHO FESCUE, INDIAN RICEGRASS, JUNEGRASS, NEEDLE-AND-THREAD GRASS, AND SQUIRRELTAIL

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Introduction

A requirement for vernalization is a common trait among cool-season perennial grasses. Species differ in the juvenile period or growth stage/size they must achieve before being sensitive to vernalization. Seed production of native grasses is relatively new to central Oregon and simple questions such as optimum planting date remain to be resolved. Farmers in central Oregon plant Kentucky bluegrass and perennial ryegrass in early fall to obtain a seed harvest the following year. If farmers could follow this model with native grasses they would not have to go a season without getting a crop, whereas with a spring planting of a grass that needs vernalization, they would receive no returns in the first year of growth.

A second issue to be considered is the need for a cold period (stratification) to break seed dormancy. Late fall planting ("dormant seeding") would place the seed in the ground in the fall so it would receive the necessary cold treatment to break dormancy over winter and germinate in the spring.

The objective of this experiment was to observe the effect of fall, late fall/winter, and spring planting dates on stand establishment and heading in Great Basin wildrye, Idaho Fescue, Indian ricegrass, junegrass, needle-and-thread grass, and squirreltail.

Materials and Methods

Great Basin wildrye, Idaho fescue, Indian ricegrass, junegrass, needle-and-thread grass, and squirreltail were planted on three dates: 15 September, 1999; 14 December, 1999; and 20 April, 2000. Planting rate for all five grasses was 25 viable (germinable) seeds/ft of row. Viable seed was based on germination tests run in our lab. Planting depth was 0.25 in with a row spacing of 2-ft using a four-row cone planter (Almaco Inc., Nevada, IA). Each plot consisted of two 20-ft-long rows. For fall and spring plantings, plots were irrigated with 0.5 in of water the day after planting and were kept moist for two weeks after planting using a solid set irrigation system. There were four replicates for each planting date.

Visual ratings of percent stand and vigor (height and tillering) on a 1 to 10 scale (10 showing the most vigor) Were made on 28 July, 2000. Percent heading in each plot was also evaluated on this date. All percent values were arc-sine square-root transformed prior to statistical analysis using the Proc GLM routine of SAS statistical software (SAS Institute, Cary, NC). All data were analyzed as a randomized complete block design.

Results and Discussion

In terms of stand establishment, there appeared to be no benefit to fall dormant seeding for any of the grasses (Table 1). The grass was planted using germination counts to determine seeding rate. This may have confounded the comparison between planting dates (i.e., low germination rates were compensated for by increasing seed rate, therefore all the plots had decent stands and potential benefits with fall dormant seeding were not expressed). However, the trend was for the dormant seeding to have poorer stands, which suggests that it didn't contribute to stand establishment in this trial. From these data it appears that a mid-September, or a mid-to-late April planting date is sufficient to produce a good stand.

In terms of vernalization, Great Basin wildrye, Idaho fescue, and junegrass failed to form many reproductive tillers, even with a September planting date (Table 1). Apparently the September planting date did not give the seedlings enough time to grow out of their juvenile stage so that they would be sensitive to vernalization over the winter. This suggests that a spring planting date may be more appropriate for these grasses, and might provide enough size by the time winter comes, allowing vernalization. Indian ricegrass and squirreltail did not require vernalization in this study; both of these grasses headed out their first year under irrigated conditions even with an April planting date. Fall-seeded squirreltail did have the advantage of producing bigger plants before it headed out, whereas the spring-planted squirreltail plants had less time to grow before heading and were smaller. Fall planting also appeared to provide the advantage of more uniform heading for squirreltail and Indian ricegrass. In conclusion, it appears that it would be more economical to spring-plant Great Basin wildrye, Idaho fescue, and junegrass with the knowledge that the stand wouldn't make a crop the first season. In this trial, Indian ricegrass and squirreltail set seed their first year whether fall or spring sown, with fall sowing tending to produce larger plants and more uniform heading (but also more weed control problems). It should be noted that these plots were kept well watered. Whether or not Indian ricegrass and squirreltail would set seed as quickly under dry land conditions in central Oregon is an open question.

Table 1. Visual evaluation of percent stand, vigor, and percent heading of several native grasses sown at three different planting dates. Vigor score was given based on plant stature and tillering on a 1-10 scale with 10 being most vigorous.

Variety	Month	Stand	Vigor	Heading
		(%)		(%)
Great Basin Wildrye	September	87.5 a	6.8 a	11 a
	December	73.8 c	7.5 a	0 b
	April	81.3 b	7.0 a	0 b
mean		80.8	7.1	4
C V (%)		4	24	15
Idaho Fescue	September	71.3 a	7.0 a	1 a
	December	43.8 b	5.5 ab	0 a
	April	57.5 ab	5.0 b	0 a
mean		57.5	5.8	0.2
C V (%)		13	15	34
Indian Ricegrass	September	45.0 ab	6.5 a	75 a
	December	27.5 b	7.5 a	74 a
	April	65.0 a	6.8 a	31 a
mean		45.8	6.9	60
C V (%)		27	30	35
Junegrass	September	72.5 a	8.3 a	10 a
	December	55.0 a	6.8 a	0 b
	April	78.8 a	7.5 a	0 b
mean		68.8	7.5	3.3
C V (%)		22	18	29
Needle and Thread	September	57.5 b	5.0 a	0 a
	December	57.5 b	5.0 a	0 a
	April	73.8 a	5.5 a	0 a
mean		62.9	5.2	0
C V (%)		8	17	0
Squirreltail	September	86.0 a	8.0 a	99 a
	December	62.5 b	4.0 b	92 a
	April	73.8 ab	4.5 ab	44 b
mean		74.1	5.5	78
CV (%)		11	21	15