TECHNICAL NOTES

U.S. Department of Agriculture Natural Resources Conservation Service

TN- PLANT MATERIALS CA-76 August 2007

'PERLA' KOLEAGRASS (*Phalaris aquatica*) AND 'BERBER'ORCHARDGRASS (*Dactylis glomerata*) ESTABLISHMENT FIELD TRIAL, RED BLUFF, CALIFORNIA

Attached is Plant Materials Technical Note No. 76, 'Perla' Koleagrass (*Phalaris aquatica*) and 'Berber' Orchardgrass (*Dactylis glomerata*) Establishment Field Trial, Red Bluff, California.

This technical note describes a conservation field trial designed to determine a successful method of establishing two perennial grasses used on California rangeland. 'Perla' koleagrass and 'Berber' orchardgrass are planted on rangeland with the goal of increasing production and extending the green-feed period over what is typically available from California's annual rangelands. An important aspect to establishing perennial grasses in California is to minimize competition from annual grasses and forbs. This technical note evaluates the effects of seedbed preparation, timing of seeding, fertilization, and tillage on establishment of 'Perla' koleagrass and 'Berber' orchardgrass along with the corresponding effect of establishment methods on annual weed competition.

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Introduction

This field trial evaluates the effects of preparation, timing, and fertilization, and seeks to determine which combination of factors is most critical and/or cost effective for the successful establishment of two perennial grasses in western Tehama County's uplands.

'Perla' koleagrass and 'Berber' orchardgrass are introduced perennial grasses commonly planted in hopes of increasing production and extending the green-feed period over what is typically available from California's annual rangelands.

Materials and Methods

The trial was designed to test three main variants; fall versus winter planting, conventional seedbed preparation versus no till, and fertilizer versus no fertilizer. These were combined into eight separate treatments as outlined in Table 1. Three replicates of each of the eight treatments were planted for a total of twenty-four plots. Each plot was the width of the range drill (4 feet) and 110 feet in length (440 square feet, or roughly one-hundredth of an acre).

Table 1. Planting treatments.

Treatments	**Fall**	**Winter**	**Conventional Seed Bed Prep.**	**No Till**	**Fertilizer**	**Unfertilized**
1	X		X		X	
2		X	X		X	
3	X		X			X
4		X	X			X
5	X			X	X	
6		X		X	X	
7	X			X		X
8		X		X		X

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Seedbed preparation on all plots included treatment with “Round up” at full recommended label rate to reduce competition prior to seeding. In addition, the conventionally tilled seedbed preparation plots were chiseled and disked to break up the compaction layer. For those plots receiving fertilizer, Triple 15 (NPK) was applied at a rate of 200 lbs. per acre. The fall seeding took place on November 15, 2004, and the winter seeding on January 30, 2005. A Truax no-till drill was used to plant 3 pounds of Perla seed and 2 pounds of Orchardgrass seed per acre (20-30 pure live seeds per square foot). Soils on the test plots consisted of Hillgate-Loam soils. The plots were treated for weed control using 2,4D post-planting in the spring of 2005.

Monitoring of establishment success took place on June 1, 2005. Monitoring consisted of ocular estimates of stand composition percentage for the two planted species, plant height, vigor, and control of competition. For this evaluation, vigor and control of competition were ranked on a scale of 1-9, with 1 being excellent and 9 being poor.

Results

Fall vs. Winter

The winter plantings showed greater growth and vigor, as well as increased control over competition in all plots when compared to fall plantings receiving similar treatments. Percentage of stand was higher in all treatments for the winter planting as well.

Conventional Tillage vs. No Till

The conventionally tilled plots showed significant increases in performance for all categories over the no-till plots when compared with similar treatments. This held true for both germination and establishment. In comparing no-till with conventional tillage in winter seeded plantings, there was a two-to-three-fold increase in stand percentage and plant heights.

Fertilized vs. Unfertilized

The fertilizer treatments produced mixed results. Germination of perennials was hindered by competition from increased annual grasses. Competition of annual grasses was a result of quick response to the fertilizer treatment by existing annual grass seed banks. Germination was more successful in the unfertilized plots, with a greater number of perennial seedlings per square foot, more leaves per plant, reduced competition, and slightly taller plants when compared to the fertilized plots. In establishment monitoring, the fertilized plots generally showed little to no improvement in percent stand, plant height, vigor, and control of competition. Based on these observations, if fertilizer is to be applied at all, one might consider applying fertilizer only to successfully established stands in the second growing season.

Establishment

Table 3 shows the 2005 establishment results for all eight treatments. Numbers shown are the rounded average of the three replicate plots for each treatment.

Table 3. 2005 establishment results.

Treatment	% Stand	Height	Vigor*	Control of Competition*
1 Fall, farmed, fertilized	10	12”	7	7
2 Winter, farmed, fertilized	60	36”	3	3
3 Fall, farmed, unfertilized	10	10”	7	7
4 Winter, farmed, unfertilized	50	36”	3	4
5 Fall, no-till, fertilized	6	7”	7	7
6 Winter, no-till, fertilized	15	20”	6	6
7 Fall, no-till, unfertilized	5	7”	8	8
8 Winter, no-till, unfertilized	15	17”	5	6

*Ranking based on a scale of 1-9, 1 being excellent, 9 being poor.

Conclusions

The key to establishing perennial grasses in California is to minimize competition from annual grasses and forbs. Chemical and mechanical means of reducing annual competition as part of seedbed preparation should be carefully considered whenever planning a perennial grass seeding.

Based on the results of this trial, the recommended prescription for establishing 'Perla' koeleagrass and 'Berber' orchardgrass in these conditions is herbicide treatment of early annual growth, followed by winter seeding into ground prepared using conventional tillage with no added fertilizer.

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