

BRADBURY

Irrigated Alfalfa-Grass Mixtures for Pesti  
OSMP Studies 4154

Study



Bradbury Allen

Irrigated Alfalfa – Grass Mixtures  
For Pesticide Reduction  
And Development of Expanded  
Hay Markets

Allen Bradbury

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1996 FINAL REPORT

Irrigated Alfalfa-Grass Mixtures for Pesticide Reduction  
and Development of Expanded Hay Markets

Prepared by

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Prepared for

City of Boulder Open Space Department

ABSTRACT

In Colorado, irrigated alfalfa-grass cropping systems can reduce insecticide and herbicide inputs while managing several pests of economic concern. Binary hay mixtures can reduce alfalfa weevil populations, thus decreasing the need for aerial applications of carbofuran and other insecticides. In addition, these crops are more competitive, thus improving management of noxious weed species that are a concern for federal and state "weed free" forage certification programs. Because alfalfa-grass stands are more diverse, there is also potential to influence populations of the alfalfa stem nematode, a significant disease problem in irrigated alfalfa. Finally, alfalfa-grass hay is a better nutritional product for horses than is pure dairy quality alfalfa hay and it lessens the risk for developmental orthopedic disease when fed to juvenile horses. Research locations will be established to compare the benefits of alfalfa-grass hay versus pure stands of alfalfa. Two alfalfa-grass seeding rates versus pure alfalfa will be compared at each location. Insects (pest and beneficial) and weeds will be monitored in the three cropping systems to establish if pesticide inputs can be

reduced. Alfalfa stem nematode populations will be monitored at 2 locations to assess the impact, if any, that crop diversity has on the occurrence of this disease.

#### OBJECTIVES

1. To assess the composition of annual and perennial weeds in plots with particular emphasis on noxious weeds that threaten "weed free" hay certification for horses.
2. To assess damage by and populations of alfalfa weevils and other arthropod pests of alfalfa including blister beetles, whose presence in horse hay is a major concern.
3. To assess the presence and dispersal of alfalfa stem nematode via annual population estimates in experimental plots, including estimates of plant injury.
4. To measure yield, forage quality and stand composition on an annual basis, especially since grasses will begin to dominate the stand over time.
5. To determine optimal alfalfa-grass seeding rates to maximize the value of 1st-cutting hay for horse markets.

#### MATERIALS AND METHODS

Acreage Requirements: 3.14 Acres

Planting Date: mid-April to June

Research Design: 5 Blocks

- 4 Treatments (orchardgrass=og, smooth brome= sb, alfalfa=aa)
- 1 og= 0.5 lb/A, sb=2.0 lb/A, aa=17.5 lb/A
  - 2 og= 1.0 lb/A, sb=4.0 lb/A, aa=15 lb/A
  - 3 og= 2.0 lb/A, sb=8.0 lb/A, aa=10 lb/A
  - 4 og= 0.0 lb/A, sb=0.0 lb/A, aa=20 lb/A
- 20 Plots (72' W x 100" L)

Planting:

Plant	Variety	Percentage			
		Trt 1	Trt 2	Trt 3	Trt 4
Alfalfa	Pioneer 5472	87.5%	75%	50%	100%
Orchardgrass	Latar	2.5%	5%	10%	0
Smooth Brome	Manshire	10%	20%	40%	0

Yield Goal: 4 tons/acre

#### PROJECT UPDATE

This project was began as part of a proposal written by Dr. Karl Kinney in 1995. After Dr. Kinney's untimely death in October of 1995, the project was taken over by Dr. Lynne Rieske-Kinney. Dr. Rieske-Kinney began planting the research site (Axelson Property) with the help of Duane Cushman, Allen Bradbury, and Jeff Rudolph on April 18, 1996. In August of 1996 Dr. Rieske-Kinney accepted a new position at the University of Kentucky. The project was taken over by Allen Bradbury in January of 1997.

During planting, it was discovered that some of the drill hoses were clogged with spider webs, the hoses were removed and unclogged. Individual repetitions were originally 100 feet by 100 feet but were changed to 100 feet by 72 feet to maximize usage of the field. On June 4, 1996, it was noted the alfalfa was in the 2-3 leaf stage of development. On June 12, 1996, the alfalfa was recorded as being in the 3-5 leaf stage.

For 1997, the alfalfa-grass stands will be monitored to check to the stand composition of alfalfa to grass. If the grass ratios are not satisfactory, it may be necessary to replant. If grass ratios are satisfactory then a regular schedule monitoring of insects, weeds, and diseases will begin.

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