

Project 08A210 (COPMC-T-9801-WL, COPMC-T-9802-WL, COPMC-T-9803-WL)

Maybell Bitterbrush

December – 2004

By: Dr. Gary L. Noller

Maybell Bitterbrush Project with Colorado Division of Wildlife

INTRODUCTION

The project contains three studies: COPMC-T-9801 bitterbrush re-establishment by drilling; COPMC-T-9802 bitterbrush re-establishment, caching vs. live transplants; and COPMC-T-9803 bitterbrush re-establishment with transplants in rows. On October 13, 2004, two of the three bitterbrush projects were evaluated. The evaluation involved examining tubling plants of antelope bitterbrush (*Purshia tridentata*) in rows and plots. The one caching plot with seedlings (Replication 1, plot 7) has been found each year from 1999 to 2004. Drilled rows were **not** examined in 2003, since live plants have not been found. Additional information on methods for planting can be found in progress reports for 1998 and 1999. No natural caches with live plants were found near the windmill. Plants in general looked good and it appeared that conditions may not have been as dry as 2003.

RESULTS

Tubling plants in rows and plots were examined on October 13, 2004. In addition, the one cache (Replication 1, plot 7) that was found each year from 1999 to 2004 was also evaluated. Soil inside the enclosure was moist to a depth of 15 inches, and was not examined to a greater depth. The average height for plants in **rows** was determined by measuring all plants in the first four rows. The average height for plants in **plots** was determined by measuring all plants where herbicide or no herbicide was used. Many bitterbrush plants inside the enclosure had light browse.

COPMC-T-9801-WL

Drilled plots – (4.5 and 9.0 ft. row spacing):

This study was **not** evaluated in 2004.

COPMC-T-9802-WL

Caching:

Plots for caching and tubling (plug) plants had 36 planting sites per plot. Only one site (Replication 1, plot 7) had plants on October 13, 2004. The one cache results in 0.3% re-establishment for caching. Since the one cache was in the herbicide (glyphosate to reduce competition) plot, this averages 0.7% re-establishment when herbicide is used to reduce competition. This cache had plants 15.0 cm tall. At the present time, caching has not been successful at this site for re-establishing antelope bitterbrush. Caching plots where plants had not been found were not examined.

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Tubling plants in plots:

Height measurements from all plots where **herbicide** was used averaged 49.0 cm, while plots where **no herbicide** was used (only one plant), measured 53.0 cm. Survival in plots where **herbicide** was used was 34.7% in 1999, 30.6% in 2000, 25.7% in 2001, 25.0 % in 2002, 24.3% in 2003 and 2004 (Table 1). Survival in plots where **no herbicide** was used was 13.9% in 1999, 9.0% in 2000, 4.9% in 2001, 1.4% in 2002, and 0.7% in 2003 and 2004. Planting tubling bitterbrush plants in plots when herbicide was used was a successful method of re-establishing antelope bitterbrush. In 2004, 51.4% of the plants were found, that were present in 1999. Herbicide is important in the initial establishment of bitterbrush tublings (50 plants with herbicide and 20 plants with no herbicide in 1999, Table 1), but also in the persistence of tublings (35 of 50 plants, 70.0% were still alive in 2004 when herbicide was used vs: only 1 of the 20 plants, 5.0% was still alive in 2004 when no herbicide was applied).

COPMC-T-9803-WL

Tubling plants in rows:

Eighteen rows of tubling antelope bitterbrush plants (716 planting sites) were examined for survival on October 13, 2004. Plants in rows averaged a height of 46.3 cm. It should be noted that rows were treated with herbicide to reduce competition before planting. Survival in rows was 21.1% (151 plants) in 1999, 18.2% (130 plants) in 2000, 17.0% (122 plants) in 2001, 16.5% (118 plants) in 2002, 15.8% (113 plants) in 2003, and 16.1% (115 plants) in 2004 (Table 2). In 2004, 76.2% of the plants were found, that were present in 1999. This was a successful method of re-establishing antelope bitterbrush on this site.

OBSERVATIONS AND CONCLUSIONS

1. The project was evaluated on October 13, 2004 for antelope bitterbrush re-establishment.
2. Seeding (both drilling and caching) was done on October 21, 1998.
3. Antelope bitterbrush tublings were planted in plots and rows on May 6, 1999.
4. Seeding (both drilling and caching) were not successful methods for re-establishing antelope bitterbrush on this site at this time. Drilled plots were **not** examined in 2004.
5. Survival of antelope bitterbrush tublings on October 13, 2004 in **plots** averaged 12.5% (24.3% when herbicide was used and 0.7% with no herbicide) on this site. This is a successful method for re-establishing antelope bitterbrush on this site at this time.
6. In **plots**, 51.4% of the plants that were observed in 1999 were found again in 2004.

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7. Planting antelope bitterbrush tublings in **rows** was a successful method of re-establishing bitterbrush and resulted in a 16.1% survival recorded on October 13, 2004.
8. In **rows**, 76.2% of the plants that were observed in 1999 were found again in 2004.
9. Herbicide was important for the establishment of bitterbrush tubling (See Table 1, 1999), and for the persistence of the tublings over time (See Table 1, 1999 to 2004).

Table 1. A listing of the number of plants found in plots treated with herbicide, no herbicide, and the total of both, from 1999 through 2004. Percent survival is also listed.

TUBLING PLANTS IN PLOTS

Date		Number of Plants	% Survival
May 9, 1999	(Planted)	288	-
November 10, 1999	(all plants)	70	24.3
	Herbicide	50	34.7
	No herbicide	20	13.9
September 26, 2000	(all plants)	57	19.8
	Herbicide	44	30.6
	No herbicide	13	9.0
November 7, 2001	(all plants)	44	15.3
	Herbicide	37	25.7
	No herbicide	7	4.9
October 4, 2002	(all plants)	38	13.2
	Herbicide	36	25.0
	No herbicide	2	1.4
October 9, 2003	(all plants)	36	12.5
	Herbicide	35	24.3
	No herbicide	1	0.7
October 13, 2004	(all plants)	36	12.5
	Herbicide	35	24.3
	No herbicide	1	0.7

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Table 2. A listing of the number of plants found in rows from 1999 to 2004. Percent survival is also listed.

TUBLING PLANTS IN ROWS

Date	Number of Plants	% Survival
May 6, 1999 (Planted)	716	-
November 10, 1999	151	21.1
September 26, 2000	130	18.2
November 7, 2001	122	17.0
October 4, 2002	118	16.5
October 9, 2003	113	15.8
October 13, 2004	115	16.1