

BLACKBRUSH, COLEOGYNE RAMOSISSIMA,  
PROPAGATION AND REVEGETATION

Harrison G. Hughes  
Eugene Weglinski  
Department of Horticulture  
Colorado State University  
Fort Collins

Objectives

This investigation was to develop a methodology for the production of blackbrush (*Coleogyne ramosissima* Torr.) propagules. Furthermore, these propagules were to be evaluated for their use in revegetation of disturbed areas in Canyonlands National Park. Stem cutting propagation and mound layering were to be evaluated for rapid propagation of blackbrush.

Methods

Experimental sites were selected on the basis of their proximity to disturbances in various stages of recovery, as well as conversations with Kate Kitchell, a Resource Manager in Canyonlands National Park. Sixty plants were selected at each site. The first site was located approximately 1.5 Km (1/2 mile) north of the Grand View Point turnaround on the west side of the road (R. 19E T. 28S. S.32) with an elevation of 1350 m (6000 ft). The second and third sites were located on the White Rim at an elevation of 1300 meters (5000 ft). The Lathrop site was located west of the White Rim Trail approximately 300 m up the upper Lathrop Canyon drainage (R. 19E. T. 27S. S.35). The Buck Canyon site was also located on the west side of the White Rim Trail 200 to 400 meters up the south hillside of the upper Buck Canyon drainage (R. 19E. T. 28S. S.4).

The initial cutting experiment involved the treatment and rooting of plant material within the propagation area set up in the residence area of the Island in the Sky (Isky) district. The study consisted of a sampling of 40 plants at each of the three sites repeated at three different dates (3-18-88, 4-17-88, and 6-19-88). The same 120 plants were sampled at each date.

Cuttings were prepared from the branches by dividing the material into wood of different age classes. Current season's growth was considered new, 1 year-old wood considered medium, and old wood which was greater than 2 years of age. There were no new wood treatments in the first sample date as the growing season had not yet begun in March. After all branches from each site were prepared, each age group was divided into

four subsamplings, each receiving a different hormone treatment. All plants were treated with a fungicide (Benlate) prior to the hormone treatments to reduce the incidence of disease. The rooting hormones consisted of a talc control, 0.3% indole-3-butyric acid (IBA), 0.8% IBA, and Rootone, a commercially available plant hormone mixture. All treatments were in powder form. Cuttings were placed into rooting packs (Rootmasters) in the mist tents following treatment. The system cycled for approximately 30 seconds every 8 minutes from 8 a.m. to 7 p.m.

The cutting experiment was repeated on a reduced scale at the C.S.U. campus. Cuttings were prepared in the same manner as those at the Isky site and given the same four treatments. The cuttings were then placed in a scoria media bed. The mist system in this case cycled for 20 seconds every 30 minutes for 24 hours a day.

Evaluation at the Island in the Sky occurred after 90 days in the case of the first two dates and 30 days for the third treatment date. Observations consisted of the number and lengths of roots for each cutting.

Mound layering was evaluated using an additional 20 plants at each of the three sites. All shoots from these plants were pruned to within 5 cm of the ground in March 1988. New shoots were present in April at which time soil was mounded to cover one half of the new growth. The mounding process was continued on a monthly basis through June with the final height of the mounds 10-15 cm.

Ten plants at each site were selected to receive supplemental water beginning in April to last through the summer. Water was supplied at a rate of approximately  $1 \text{ ml min}^{-1}$  by a gravity fed drip system using 55 gallon drums as a water supply. The drums were refilled and calibrated monthly through August 1988. The delivery rate from plant to plant and month to month was observed to be highly variable due to the simple nature of the delivery system.

## Results

Due to malfunction of the mist system at the Isky site data was inconclusive, i.e. rooting occurred but because of a disruption of the mist system all cuttings died.

Cuttings at the C.S.U. location after 8 weeks at which time the number and length of roots produced by each cutting were noted. Rooting of plants in the first sample date ranged from 5% to 80% depending on the treatment. Initial analysis indicates that hormone treatments significantly increase rooting and that age of wood had an effect on rooting. A more complete analysis is in progress and final results will appear in the annual report after all sample dates have been evaluated.

Observation of rooting in the mound layers took place in October, 1988.

Only one root was produced in the entire experiment. There was an obvious increase in the growth of the plants receiving supplemental water. Although essentially no rooting occurred under these experimental conditions, it may have been due to moisture levels lower than might normally be present in mound layers.

#### Future Work

Cutting propagation experiments will be repeated at C.S.U. unless different facilities can be established at Canyonlands at three dates in spring and summer of 1989. Field establishment of rooted cuttings will be accomplished in spring 1989 with evaluation in fall 1989.

#### Conclusions

Stem cuttings of blackbrush will root under mist. Differences in relative rooting was observed with the addition of auxins. Mound layering does not lead to rooting under the field conditions used in this experiment.

#### Literature Cited

Loope, W. L. 1978. Prospects for revegetation of disturbed sites in Canyonlands National Park, Utah. Prepared for Canyonlands Nat. Hist. Assoc.