STUDY PLAN
SPROUTING OF BITTERBRUSH

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1. Purpose: To determine whether or not observed occasional sprouting of bitterbrush \textit{(Purshia tridentata)} in California is a special heritable characteristic.

Bitterbrush is a valuable browse for big game and livestock in the eastside region of California. It has been killed out over extensive areas by heavy grazing, fire, insect depredation and other factors. Studies are now in progress to find out how the species can be reseeded artificially.

Throughout most of California, bitterbrush does not sprout. However, sprouting plants have been found in a few locations. The aim of the present study is to determine whether this sprouting is a special genetic characteristic or a site response. If the former, additional studies will be undertaken to strengthen and fix this characteristic in particular strains so seed of sprouting varieties can be produced for range seeding. Sprouting forms are needed to minimize the damaging effects of grazing, fire, and insects on the plant.

2. Method: Both seed and stem cuttings from sprouting and non-sprouting forms of \textit{Purshia tridentata} will be used to grow a number of test plants in the greenhouse at Berkeley and also on field plots within the natural range of the species. When the plants are about a foot tall their crowns will be removed by clipping or other means to see if they sprout or not. Results of these initial tests will determine future experiments.
3. **Design**: (The design as here outlined may require modification if the necessary cuttings and seeds are not obtained this year.) A total of 200 rooted cuttings, 100 from sprouting and 100 from non-sprouting plants, are needed. Half of the sprouting and non-sprouting plants will be planted in 5-gallon cans and the other half in 1-gallon cans for planting in the field at a later date.

An attempt will be made to stimulate root growth in the cuttings by immersing the basal end of the cuttings in 40 ppm indole butyric acid for 24 hours. If the cuttings cannot be rooted by this means, it will be necessary to conduct an initial study to determine a suitable rooting method. This will not change the design of the test, but will affect the time schedule.

In addition to plants from cutting, 200 plants will be grown from seed—100 from non-sprouting varieties and 100 from sprouting varieties. Half of these plants will be planted in 5-gallon cans and the other half in 1-gallon cans as in the case of the cuttings. Thus in the entire study, there will be a total of 400 plants divided into eight categories of 50 plants each.

Defoliation will be started when the plants are about a foot high and continued at intervals throughout the year governed by the responses obtained. Different groups of plants will be defoliated to different degrees and in different ways. A minimum of 5 plants will be used in any group. A maximum of 10 different defoliation methods can be tried in each of the eight categories of plants.
4. **Schedule**
   
   a. Start cuttings in the rooting bed by November 15, 1955.
   
   
   c. Obtain soil for 5-gallon cans by March 1, 1956 or earlier.
   
   d. Plant rooted cuttings and seedlings in cans and in the field by July 1, 1956.

5. **Materials Needed**
   
   a. Seed
   
   b. Stem cuttings
   
   c. Soil to fill 200 5-gallon cans and 200 1-gallon cans
   
   d. Cans (200 5-gallon, 200 1-gallon)