Reseeding Forage After Burns

tests show seedling growth is best when forage is seeded in areas of white ash left by burns producing intense heat

Eldon F. Azevedo

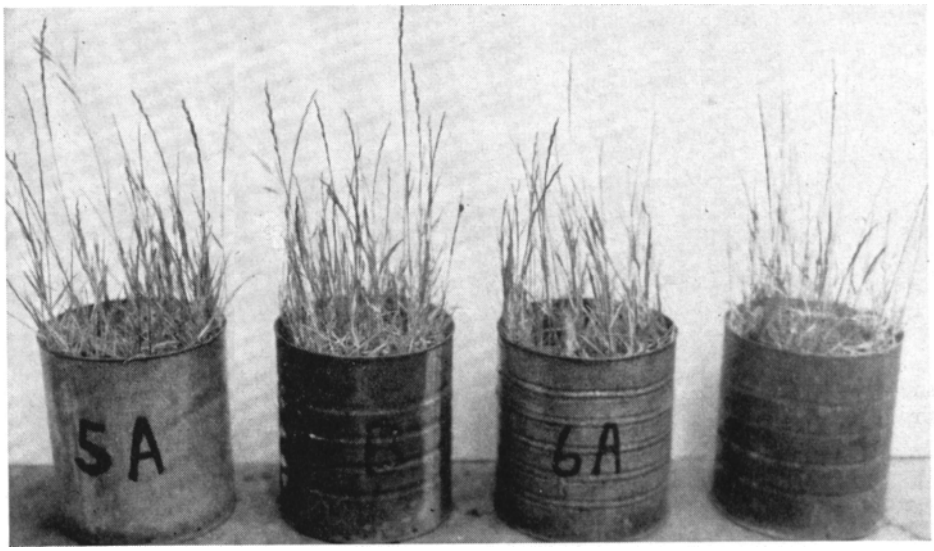
Heavy growth of forage—seeded after a brush burn—on foothill ranges in Butte County was particularly noticeable in the areas covered by white ash at the time of reseeding.

Extensive range improvement tests—involving hundreds of acres—have included reseeding under all sorts of seedbed conditions.

In these tests, reseeded grasses and legumes did not generally establish themselves satisfactorily on rangeland cleared of brush mechanically. This was true in areas where the soil had been worked so that practically no competition was present and also true in areas that had not been worked at all other than the removal of the brush.

White ash—resulting from an intense burn—indicates the ground was heated to a temperature sufficiently high to stimulate growth of forage seeded later. A fire that travels fast, even though it is through heavy brush, may not develop enough heat to leave white ash.

During the tests, brush was piled and burned in nonbrush areas and increased growth followed. In many instances—when the white ash was removed from certain areas—the increased forage growth was the same as where the ash was left in its original position. Placing white ash on unheated areas did not cause additional growth.



Soil in cans 5-A and 5-B is of the Aiken series and taken from an open area near a brush patch. Soil in 6-A and 6-B was from under a heavy growth of brush.

The seeds used in field tests were subterranean clover, rose clover, Harding-grass, orchardgrass, perennial and annual ryegrass, smilo, Burnett, and others.

Many reseeding tests were made where wild fire had occurred and—apparently—even under favorable conditions, comparatively few perennials will become established if there are no rains before December 15th or unless a very late spring follows the seeding. It appears

Results of a successful brush fire in Butte County, which left plenty of white ash.

Soil in 1-A and 1-B was taken from an area near Bangor, after a regular brush burn. Soil in cans 2-A and 2-B was taken nearby but where no heat was involved. The cans were seeded on January 12, 1954 and photographed on April 22, 1954.

that brush and pine seedlings react similarly to other vegetative growth and are stimulated by fire-heated soil. Generally speaking, the seeded perennials did not spread to adjoining territory in subsequent years. However, there were limited exceptions.

To verify observations made on the range, a series of tests was made with annual ryegrass seeded—January 12, 1954—in heated and unheated soil samples. The resulting seedling growth was photographed on April 22, 1954. The procedure was the same in each test.

In one test, Aiken soil was taken from an area near Bangor—after a regular burn—and the white ash was removed. As a check, soil was taken also from a nearby area that had not burned, so no heated soil was involved. Both samples of soil were placed in No. 10 cans and seeded. The soil was kept moist. Comparative growth of the seedlings is shown in the illustration at the upper left.

A second test was made with Redding-type soil taken from a site where brush had been collected, piled, and burned. The intense heat from the burning piled brush produced white ash, indicating the ground temperature had been raised. The soil for the check cans was taken from an adjacent spot where brush was not burned. The picture at the right shows the vegetative growth obtained in this test.

The third test was made with soil of the Aiken series. One soil sample was taken from an open area near a brush patch. The other sample was taken from under heavy brush. Neither sample had been heated by fire. Growth of the ryegrass in this test is shown in the picture on page 12.

Soil in cans 3-A and 3-B was from an open area of Redding-type soil where brush was piled and burned. Soil in 4-A and 4-B was from a nearby, unburned area.

From range observations and the results of the verifying tests it appears that a seeding rate or mixture can not be determined until after a fire—it's impossible to tell in advance how successful a brush burn will be—and furthermore, growth stimulation by the heated soil depreciates about 50% the second year and is practically gone the third year after the fire.

Eldon F. Azevedo is Farm Advisor, Butte County, University of California.

AVOCADO

Continued from page 7

side with the Zutano variety, representing type B.

The plots contained two trees of approximately the same age and vigor. Each tree was caged individually, and if any advantage existed among the trees, that tree was chosen as the one to be caged without bees. All cages were 12′ × 12′ × 16′ except tree No. 2 in the Hass plot which was only 12′ high. The cages were constructed of regular window screening with a Lumite cloth top, except for tree No. 1 of the Hass plot which had a cheesecloth covering on top. Prior to completing the enclosure of the trees, all fruits and open flowers were removed and only enclosed buds remained.

The trees in the Hass plot were caged on March 1, and a hive was placed in the cage under tree No. 2 on March 3. Single story hives containing 10 frames were used. In the Hass plot, eight frames were full; in the Zutano plot, two were full. On June 14, at the end of the blooming season, the bees were removed and the cage dismantled.

In the Zutano plot, cages were erected on February 23 and 24, 1954. The trees started to bloom during the first week in March and a hive was placed in the cage under tree No. 2 on March 15. On May 20 the bees were removed, and the cages were dismantled on June 2 and 3.

After the removal of the cages, the fruit on each caged tree was counted. The Zutano without bees had four fruits; the Zutano caged with bees had 120 fruits. The beeless Hass tree had five fruits, as compared to the 284 fruits of the Hass caged with bees.

Because an individual flower—apparently—cannot pollinate itself and subsequently produce a fruit, it is important that the pollen arrives on the stigma at the proper time in the flower cycle. Therefore, some agent of pollen transfer must be necessary. However, close pollination is possible through the medium of bees when the two flower stages overlap, so that for brief periods of the day pollen and receptive stigmas are present on a tree at the same time. In addition, residual pollen might be carried by the bees and remain viable for effective pollination even if no overlap of stages occurs.

Although there is a need for some form of insect visitation for pollination and subsequent setting of fruit, there is no evidence that the introduction of additional bees to the existing natural population of wild bees or other large flying insects can increase fruit set.

Peter A. Peterson is Assistant Geneticist in Horticulture, University of California, Riverside.

Duration of Movements in the Dual Opening Cycle of a Flower of Zutano (Type-B) Avocado Variety, as Disclosed by Motion Picture Study under Glasshouse Conditions.

Procedure	No. of minutes	Approximate time	
Stage I—1:15 to 7:15 p.m., May 18, 1954			
Filming begun		1:15 p.m.	
Preopening—flower bud expanding	95½	1:15 to 2:50 p.m.	
Flower opening	5	2:50 to 2:55 p.m.	a*
Opening movements of flower parts continuing	85	2:55 to 4:20 p.m.	a*
No movement	65	4:20 to 5:25 p.m.	a*
Closing movements	65	5:25 to 6:30 p.m.	a*
Termination of stage I (flower closed)	42½	7:15 p.m.	
Stage II (same flower)—5:40 to 11:00 a.m., May 19, 1954			
Filming begun		5:40 a.m.	
Preopening—flower bud expanding	41	5:40 to 6:21 a.m.	
Flower opening	85	6:21 to 7:46 a.m.	
Flower fully open, but pollen valves still closed	52½	7:46 to 8:40 a.m.	
Pollen exposed—various valves open	69	8:40 to 9:49 a.m.	
Flower open, all valves open, filming stopped		11:00 a.m.	

a* Maximum period of pistil receptivity for fertilization—220 minutes (3 hours and 40 minutes).