November preceded the first strong storm and probably favored infiltration rather than overland flow. This area was treated in June, so the herbicide was available for degradation for 6 months after runoff occurred. Time of application and pattern of precipitation probably account for the low levels of herbicide in the runoff from this study area. (Joint contribution from USDA, Forest Service, Forestry Sciences Laboratory; Agri. Exp. Sta., Oregon State University, Corvallis, Oregon.)

Evaluation of herbicide treatments for the control of creosotebush (Larrea tridentata). Gould, Walter L. and Carlton H. Herbel. Creosotebush is an evergreen xerophyte which has invaded extensive areas of desert rangeland in the southwestern United States. Much of the infested area at one time was productive grassland, but drought and grazing by livestock has shifted the balance in favor of the brush, so many areas are heavily infested with creosotebush and nearly devoid of grass. Control of the creosotebush is necessary to effect revegetation. Creosotebush sprouts profusely from the crown when the topgrowth is removed mechanically. Satisfactory seeding methods have not been developed for the arid Southwest, so chemical treatments must be used which will selectively remove the brush and leave the grass.

Treatments were applied on the Jornada Experimental Range near Las Cruces, New Mexico from 1961 through 1965 to determine the most effective herbicides and the optimum date of application for the control of creosotebush. Simulated aerial application was made on 1/100 acre plots at two week intervals from July through October or November. In one year (1963), treatments were initiated in April. Treatments in 1961 included 2,4-D, 2,4,5-T, 2,4-DP, silvex, 2,3,6-trichlorobenzoic acid and amitrole-T. In 1962, dicamba was added to the list of herbicides, and in 1963 picloram was added. The herbicide rate at each application date was 1/2 lb/A in 1961 and 1962, 1 lb/A in 1963, and 1 1/2 lb/A in 1964 and 1965, except that picloram was applied at 3/8 lb/A in 1963. On one spray date in 1962, 1963 and 1964, herbicides were applied at 3 rates to help elucidate the optimum herbicide rate.

The dates of maximum toxicity, as determined by evaluating the degree of defoliation 2 years after herbicide application, varied yearly from late July to early November, but generally in a given year all the herbicides caused maximum defoliation on a common date of application. Treatments during September caused the highest degree of defoliation in three of the five years. Highest levels of defoliation occurred from treatments with dicamba, picloram and 2,3,6-TBA on 3 different dates in two of the years. Very little defoliation was obatined from treatments applied before July. This would indicate that creosotebush is most susceptible to herbicides when treated after the summer rainy season has started.

The phenoxy herbicides and amitrole-T were not effective on creosotebush, giving 20%, or less, defoliation on all application dates in every year except 1961. Seventy percent defoliation was obtained on several spray dates with 1 1/2 lb/A of 2,3,6-TBA, dicamba and picloram, but the results were variable between dates and between years. On a given

spray date, increasing the rate of dicamba or 2,3,6-TBA, above 1 lb/A caused an increase in defoliation, but this effect was not always observed using picloram. (Cooperative investigations of Crops Research Division, Agricultural Research Service, U.S. Dept. of Agriculture, and New Mexico Agric. Expt. Sta., New Mexico State University, Las Cruces).

Herbicide evaluation studies for the control of tarbush (Fluorensia cernua). Gould, W. L. and C. H. Herbel. Tarbush is a deciduous desert species which is found in dense stands on silty or clay loam sites on flood plains. The date of leaf emergence is dependent upon adequate soil moisture, so in some droughty years it may not leaf out until the summer rains occur.

The studies reported were carried out on the Jornada Experimental Range near Las Cruces, New Mexico from 1961 through 1965 to determine the best time for treatment and the best herbicides for selective control. Treatments were applied semi-monthly on 1/100 A plots using a simulated aerial application from July through October in 1961 and 1965. Treatments were initiated in August in 1962, on May 7, 1963, and on June 3, 1964. Defoliation estimates were made approximately two years after treatments were applied.

The 1961 treatments included 2,4-D, 2,4-DP, 2,4,5-T, silvex, 2,3,6-TBA and amitrole-T at 1/2 lb/A. Dicamba was added to the list of test materials in 1962, and picloram was added in 1963. Herbicides were applied on all spray dates at 1/2 lb/A in 1962, 1 lb/A in 1963, and at 1 1/2 lb/A in 1964 and 1965. Additional treatments with higher rates of herbicides were applied on one spray date in 1962, 1963 and 1964.

The degree of defoliation was quite variable between dates of application with the September treatments being most toxic generally. At rates up to 2 lb/A the phenoxy herbicides and amitrole-T usually gave less than 30 percent defoliation. Dicamba was the most toxic material, causing 70 percent defoliation on one or more spray dates each year. Increasing the rate of dicamba from 1/2 to 2 lb/A, increased the degree of defoliation only when treatment was not on the optimum date. At comparable rates of picloram and 2,3,6-TBA were much less effective than dicamba. (Cooperative investigations of Crops Research Division, Agricultural Research Service, U. S. Dept. of Agriculture, and New Mexico Agric. Expt. Sta., New Mexico State University, Las Cruces.)

Evaluation of aerial treatments for the control of creosotebush (Larrea tridentata). Gould, W. L. and C. H. Herbel. Creosotebush frequently occurs in almost pure stands in areas of the Southwest where it has invaded. Selective chemical control of creosotebush offers a means for natural revegetation where remnants of perennial grasses remain. This study was initiated to evalute the response of creosotebush to aerial application of materials which had appeared promising in small plot tests.