potential sites by use of springs for recreational, residential or other purposes, and invasion of sites by competing weedy species. In sum, the species is seriously threatened and should be considered for inclusion in the list of endangered species.

26. PLANT GROWTH RESPONSES TO SURFACE SOIL ELEVATION ON FINE TEXTURED SOIL. T. Carrens and B. C. Williams, New Mexico State University, Las Cruces 88003.

This study was conducted to determine plant growth of grain sorghum on a poorly drained heavy soil.

The treatments used were single beds, double beds, and flat beds of a low and high elevation. These treatments were used to simulate field conditions for disappearance of water from the soil surface following rains or irrigations.

It was found that the higher single beds and the high flat beds gave consistently higher increases in height and diameter of plants throughout the study.

27. THE ECOLOGY AND MANAGEMENT OF PINON PINE (*Pinus edulis* Engelm.) AND JUNIPER (*Juniperus monosperma* [Engelm.] Sarg. AND *J. deppeana* Steud.) WOODLANDS OF SOUTHCENTRAL NEW MEXICO. Gordon Lymberg and Rex D. Pieper, New Mexico State University, Las Cruces 88003.

The pinon-juniper woodlands cover approximately 48,000,000 acres in the U. S. Of this amount nearly 33,000,000 acres are in New Mexico and Arizona. These trees provided an invaluable source of food and fuel for the Indians and early settlers of the region and are used as such today. However, wildfire suppression and continuous livestock grazing on many pinion-juniper rangelands have resulted in increases in tree densities and decreases in grass production and ground cover on many areas.

In July, 1975, a five-year study of the ecology and management of pinon-juniper woodlands was initiated on the Fort Stanton Experimental Ranch in Lincoln County, New Mexico.

The objectives of this study are:

(1) To determine the effect of tree density, size (height, diameter and canopy cover) and age on ground cover (plant basal area).
(2) To determine the effects of slope and aspect on tree density, size and age.
(3) To determine the abiotic parameters of soil pH, soil color and soil texture.
(4) To determine the production of firewood, pine nuts, fence posts, and christmas trees as influenced by biotic and abiotic parameters.
(5) To collect and identify the flora of the ranch and record phenology data for certain plant species.
(6) To examine the effects (ground cover and production data) of cabling (mechanically removing) pinon-juniper trees, and to make comparisons between old (1956) and new (1975) cablings.

Certain phases of the study are currently in progress. Analysis of variance and multiple regression are being used to analyze collected data.

28. RECLAMATION OF A LOW YIELDING RANGELAND SITE. J. M. Tromble, R. P. Gibbens and C. H. Herbel. U. S. Department of Agriculture, Agricultural Research Service, Las Cruces, 88003.

Nonproductive range areas have been created where the erosive forces of water and wind have removed the surface soil, exposing a subsoil which is impermeable to water. Water ponding is being studied as a possible reclamation technique. Site characterization is being accomplished by use of soil surveys, rainfall simulator, soil temperature, and soil water profile measurements. Treatments consisted of constructing and instrumenting a series of crescent- or horseshoe-shaped dikes designed to impound water 3 and 6 inches deep; any excess water flows around either end of the dike to be caught by the next lower dike. The objective is to retain water longer on the soil surface and permit additional infiltration opportunity. Ten of these dikes were constructed on the Jornada Experimental Range in the spring of 1975. They effectively caught and held water, greatly increasing the depth of soil water and lengthening the period of soil water availability when compared to untreated areas. Grasses are being seeded to hasten the recovery process. The technique looks encouraging, and research efforts are continuing.

29. PRETREATMENT AND POST TREATMENT DENSITIES OF THE RANGE CATERPILLAR IN NORTHEASTERN NEW MEXICO IN 1976. D. M. Jackson, E. W. Huddleson, R. T. Statten and Gene Lessard. New Mexico State University and USDA, Las Cruces 88003.

In 1976, range caterpillar densities exceeded the economic threshold in large areas of northeastern New Mexico. A total of 736,099 acres were treated by airplane with Dylox® in a cooperative federal-state-private program. Evaluation was conducted by New Mexico State University; USDA, APHIS; and USDA, Forest Service to: 1) evaluate the densities and spatial distribution within the area to be treated, 2) evaluate mortality resulting from application of the insecticide, and 3) evaluate the effect of the induced mortality on resurgence in future years.

Permanent study sites were established in each region proportional to the acreage. The counting techniques employed a 20 x 20 meter grid plot, from which twenty km^2 samples were counted. Data were computed from all sites prior to spraying and repeated post spray after 1 to 6 day waiting intervals to determine efficacy.

Tabulated population data from pre- and post-spray on site analysis revealed mean % mortality of 1) 84%; 2) 87%; 3) 98%; 4) 96%; 5) 96%; for the regions of 1) Abbott, Colfax County; 2) Maxwell, Colfax County; 3) Colmor, Colfax and Mora Counties; 4) Mills, Harding County and 5) Gladstone, Union County, respectively, with an overall mean mortality of 92.2% as a result of the Dylox application.

30. EFFECT OF AGE AND NUMBER OF MATINGS ON OVIPOSITION OF THE RANGE CATERPILLAR. J. G. Watts and Ellis W. Huddleston, New Mexico State University, Las Cruces 88003.

Although the range caterpillar, *Hemileuca oliviae* Cockerell, is a serious range pest in north-eastern and east-central New Mexico, many details of its biology are unknown. During the mating season of 1975, experiments were conducted to determine: 1) fecunidty; 2) effect of age at mating on