

# The Johnston Chain Drag for Clearing Brush from Range Land

ROBERT A. LYMAN AND WALTER E. SYKES

Work Unit Conservationist and Territorial Conservationist, respectively, Soil Conservation Service, U. S. Department of Agriculture, Honolulu, Territory of Hawaii.

THOUSANDS of acres of range lands in the Hawaiian Islands are now in poor condition and have been reinvaded by brush. This brush is of two kinds: native and exotic. The native brush is aalii (*Dodonaea viscosa*), puakeawe (*Styphelia douglasii*), and ohia lehua (*Metrosideros collina*). Ohia lehua often becomes a small tree. These woody species are found on about 60 percent of the brushy range lands (Figures 1 and 2.) Other

mountain pili (*Panicum tenuifolium*), Dallis grass (*Paspalum dilatatum*) and Kikuyu (*Pennisetum clandestinum*). These grasses make little growth on brush-invaded ranges.

Allan Johnston, manager of the Kapapala Ranch on the island of Hawaii, developed a chain drag for clearing brush-invaded ranges. He has been clearing the brush from 18,000 acres of the 54,000-acre ranch at the rate of about 4,000

The drags are made from used anchor chains. They are fastened to an "H" beam in two or three loops. A 3-loop chain drag is shown in Figure 3. Each link weighs about 80 pounds. The total weight of the drag ranges from 3 to 8 tons, depending on the number of loops and the number of links in each loop. Anchor chains are also used to make

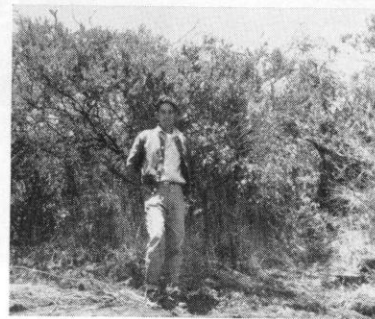


FIGURE 2. Large brush on rocky soil may be successfully cleared with the chain drags. (Photograph by Soil Conservation Service)



FIGURE 1. Brush-invaded range on the Kapapala Ranch, Island of Hawaii. (Photograph by Soil Conservation Service)

portions of the brushy ranges were invaded by two introduced species that are spreading rapidly and becoming serious pests. The two exotic species are guava (*Psidium guajava*) and Christmas berry (*Schinus terebinthifolius*). Cactus (*Opuntia megacantha*) occurs on some sites.

Many of the now brushy ranges once supported good grasses such as

acres per year at a cost of as little as \$5.00 per acre.

Johnston first began developing the chain drag in 1945. The drag has been perfected so that it can be adapted to the kind and size of the brush, the nature of the terrain and the size of the tractor. It is especially suited to use on rough, rocky land because it is flexible.

the hitch. The sizes of three chain drags, their weights and the power required to operate them are shown in Table 1.

The drag works best when a "U" clamp is used to fasten the chains to the "H" beam spreader bar so that the bar rides on the links. The links then act as skids and the drag works smoother, especially on rocky land.

The hitch should be connected continuously to either the inner loop or the middle loop of the drag. This provision allows the spreader

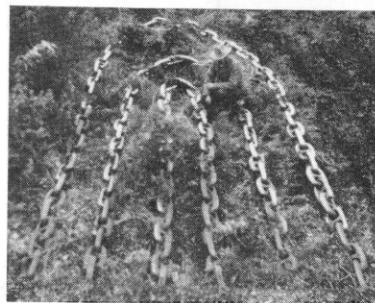


FIGURE 3. A 3-loop chain drag. (Photograph by Soil Conservation Service)



FIGURE 4. A 2-loop chain drag and the seedbed resulting from its use on ranges with medium-sized brush. (Photograph by Soil Conservation Service)

The equipment has handled brush up to 4 inches in diameter.

The chain drag smooths the ground and leaves the residues on the surface for erosion control. A typical job of clearing and the seedbed resulting from it are shown in Figure 4. A broadcast seeder has been developed for mounting on the rear of the tractor. The chain drag covers the seed but does not bury it too deeply.

Chain drags have not been expensive, and maintenance costs have been low. A 6-ton drag with a total of 150 links of used anchor chain has cost about \$380 for materials. On the rocky lava soils of the Kapapala Ranch the chain drags have given good service for about two years.

bar to pivot and clear when one side is caught on a boulder or tree. The bar does not clear when the hitch is connected to the outer loop of the drag.

The chain drag has cleared land and prepared a seedbed in one operation on rough, rocky areas where no other method was practical. On better lands, the chain drag has competed favorably with the bulldozer, brush rake, rotary choppers, brush and bog disks, or aerial spraying with herbicides.

Table 1. Specifications for three sizes of chain drags and the power required for operation

Parts	Size of Tractor		
	TD-24 (148 H.P.)	D-8 (130 H.P.)	RD-6 (65 H.P.)
Inner loop.....	40 links	30 links	20 links
Middle loop.....	50 links	40 links	0 links
Outer loop.....	60 links	50 links	30 links
Hitch.....	30 links	30 links	24 links
Total.....	180 links	150 links	74 links
Weight per link.....	80 lbs.	80 lbs.	80 lbs.
Total chain weight.....	14,400 lbs.	12,000 lbs.	5,920 lbs.
"H" beam size.....	12" x 11'6"	12" x 11'6"	12" x 10'
"H" beam weight.....	518 lbs.	518 lbs.	450 lbs.
Total drag weight.....	14,918 lbs.	12,518 lbs.	6,370 lbs.



### COMING EVENTS

- January 11-13** Southern Weed Conference, Memphis, Tennessee  
**January 12-14** American National Cattlemen's Convention, Colorado Springs, Colorado  
**January 15-24** National Western Stock Show, Denver, Colorado  
**January 26-29** Seventh Annual Meeting, American Society of Range Management, Omaha, Nebraska  
**January 29-February 7** Southwestern Exposition and Fat Stock Show, Fort Worth, Texas