

LOS ANGELES COUNTY FIRE DEPARTMENT

FUEL-BREAK REPORT NO. 3

U. S. DEPARTMENT OF AGRICULTURE
PACIFIC SOUTHWEST FOREST AND RANGE
EXPERIMENT STATION
FOREST SERVICE, REGION 5

SD421 DRILLING--A GOOD METHOD OF SOWING GRASSES ON FUEL-BREAKS

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Sowing with a drill is the best way to obtain the good grass stands needed for soil protection on fuel-breaks or for forage on rangeland where brush has been removed. Two years of testing have shown this is true in southern California, as longer experience has proved for other kinds of land in the West. In fact, the adequate stands obtained from drilling in all tests during two extremely dry years convinces us that we can establish perennial grasses consistently on fuel-breaks wherever a drill can be used.

Unfortunately we can't use this positive method on all areas to be cleared as fuel-breaks in southern California, because the land often is too steep or rocky for a tractor and drill. Here, we must do the best we can with broadcast sowing, usually from the air, to get a cover started as soon as possible. However, many areas can be selected for drilling; in total they cover thousands of critical acres. We should consider carefully the use of this sowing method on drillable sites where we badly need full, permanent plant cover.

Where to Use A Drill

Fairly steep slopes--We can now use a drill on many places that were too tough for drilling before the heavy, rugged rangeland drill was developed. It was designed for slopes under 30 percent gradient where a D-4 size, or smaller, tractor would be used. We have stretched its use past these limits, up to 45 percent gradient, or steeper, by using a heavy tractor for safety and efficiency. The rangeland drill is quite easily used on slopes under 40 percent if the tractor has solid footing. Above this gradient more care is required for safety, more turning is required, and the job is more costly. Yet, cautious use of the drill on fairly steep slopes is justified.

Bulldozed areas--Fuel-breaks or other areas cleared by contour work with a bulldozer can be drill sown. Sowing should be done soon after the brush has been removed. The seedbed will be too weedy if sowing is delayed one or more years and resident annuals have increased to the point where they furnish excessive competition with the sown species.

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Many hand-cleared areas also can be drill sown, even though the seedbed usually is less favorable than that on bulldozed areas. Again the work should be done the same season as the brush removal, for native species will produce competing cover at a rapid rate.

Fresh burns--A hot burn in dense brush leaves an excellent seedbed for drilling. All areas of suitable terrain and with few surface rocks should be sown with a drill. Typical small unburned stems of chamise, manzanita, and other brittle plants present little deterrent to drilling. But, large brush and all stems of oak and other species which do not break easily should be removed before drilling or be by-passed with the drill.

Which Grasses to Drill Sow

Perennial grasses--Drilling is much the best way to sow perennial grasses, which we recommend for permanent cover on fuel-breaks and other type conversion areas. Seed germinates well in drill rows where it is covered by soil that prevents excessive drying. Also, the seedlings root down well and are not apt to be killed by frost heaving. All this adds up to a good initial grass stand, and this is needed because perennial grasses do not thicken up quickly from a thin stand.

Results from drill sowing of perennial grasses have been good. In tests at 7 locations, on all plots sown with a small drill the initial stand averaged 1 to several seedlings per square foot. On 4 large administrative projects, 35 to 108 acres in size, drilling also produced satisfactory initial stands of perennial grasses.

The main value of drilling was the more uniform cover. One or more perennial grass seedlings were established in 74 percent of the square-foot sample quadrats as compared with only 33 percent of the quadrats on broadcast sown plots.

Mortality of the 1959 perennial grass seedlings was high, but in 1960 the perennial grass stands still averaged about 1 seedling per square foot, and 1 or more seedlings survived on 52 percent of the square-foot quadrats. These are good results for such poor rainfall years.

The good first and second year results in establishing perennials, of course, do not guarantee their longtime survival or value as soil cover. Only time will prove these points, one way or another. But our results during two dry years, and earlier experience in central California, encourage us to think that in southern California one or more perennials will be adapted on each productive site.

Annual grasses--Drilling also has produced much better stands of annual grasses than did broadcast sowing in all of the test plots. But, good initial stands are not so important for annual grasses because they will thicken from seed if the first-year stands are thin.

Where sown by drill we recommend a seed mixture dominated by perennial species. The extra cost of drilling usually is not justified if only annual grasses are sown.

Cost of Drill Sowing

Sowing with a drill is more expensive than aerial broadcast sowing. The difference may not be great where an expensive seed mixture is used, because only half the quantity of seed is required for drilling. Total cost of drill sowing can be under \$10.00 per acre where all factors are favorable. But, if equipment transport charges are high, or if the terrain is steep so that the operation proceeds slowly, the cost can be \$20.00 or more. Perhaps about \$15.00 per acre is the best estimate that can be made now for the conditions encountered on most fuel-break areas.

Where to Broadcast Sow

Broadcast sowing should be used on all cleared areas that cannot be drill sown, if a natural plant cover will not develop rapidly. A fresh burn in dense brush on land too steep or rocky for drilling is the best example of an area which should be broadcast sown, because it will revegetate too slowly if left unsown.

In all of the plot tests during the past two unfavorable years, broadcast sowing has produced poor stands, as compared to drill sowing. Yet, when all conditions are favorable, broadcasting can produce good stands. A loose, mellow soil surface is needed so that the seed will be covered. Also, a mild winter with at least fair rainfall and no long periods of desiccating wind are required. Without these conditions, the stands often are poor and may be failures.

Broadcast sowing is best done before the fall rains have compacted the soil surface. In contrast, drilling can be done early or late. But it shouldn't be unnecessarily delayed, and it should be finished by February.

George Edmunson of the FUEL-BREAK staff has prepared a report to be published as a technical paper, which gives in more detail the results and conclusions from drilling and broadcast sowing of grass.