

RR
Pine Ranges

Getting the Evidence

Three facts relative to a study of sheep damage to pine seedlings were shown by an intensive "experiment" at the Blacks Mountain Branch Station. These facts are:

1. At least under certain conditions sheep actually select seedlings while grazing.
2. The stubs of sheep-grazed seedlings show a characteristic type of fracture.
3. Sheep often remove seedlings by grazing and leave no evidence behind except tracks.

To answer questions on the above points raised during examination of field plots, a sheep was confined in a small pen and observed actually grazing pine seedlings. The remaining stubs were collected and found to be nearly identical with those recorded in the field as killed by sheep grazing--a clinching argument in support of the field work. Conclusions concerning extent of sheep damage to reproduction, or that sheep are a significant factor in establishment of reproduction, should not be drawn from this small study. It was designed to find what evidence remains on the ground after sheep graze seedlings, in other words, to improve and support the technique used in examination of plots after sheep have been on them--a difficult job at best.

A hungry old ewe placed in the pen made herself at home and within an hour was responsible for the death of 24 vigorous seedlings from 17 locations in the small area. At times she took them faster than one observer could make collections and write notes. The seedlings grazed were in the open and definitely selected although plenty of green feed was available. From 9 of these spots 12 seedlings were collected for comparison with those from the field plots. From these the appearance of grazed seedlings was established. The other 8 spots were equally instructive as the seedlings were removed completely, leaving no stub. Actual grazing at six of these was observed and there was no doubt as to the fate of the other two, for the spots had been well marked beforehand. A group of five seedlings from a rodent cache of seed were taken bodily in one bite only a few feet in front of the observer. This supported evidence in the field that many of the seedlings gone from plots in the van of a band of sheep had been removed by grazing. Sufficient "evidence" was collected after an hour of grazing and the experiment considered complete. At that time few seedlings in the open were left.

When grazed typically the outer dry, brittle layer, or "bark", of the pine seedling stem is broken as a jagged fracture and the tough, green inner portion usually extends as a cylinder about 1/10 inch above this break. The tougher strands of the conducting elements do not break and must be pulled apart or cut through, which is done, apparently, during the characteristic raising of the head associated with cropping. The length of the cylinder and the shape of its end varies considerably. In some cases it scarcely projects, being cut by a clean "bite", while in others it extends nearly half an inch and is frayed on the end.

Copy for MWT

RR
Pine Ranges

CONCLUSIONS

(After first grazing by sheep)

This study indicates sheep do considerable damage to a good seedling crop and that the management of sheep for a certain period after such crops may be a serious problem in areas where establishment of reproduction is of prime importance.

A few definite statements from results to date point up the problem:

1. Sheep select pine seedlings for browse. Of the original 2579 seedlings, 3.2% were killed by sheep grazing. In terms of percent mortality, of the 936 seedlings which died, 11%, or 12%, were grazed.

In addition, 6.1% of the seedlings, or 22% of the total mortality, were recorded as "gone." Evidence indicates that most of these probably were pulled up by sheep.

2. Trampling by sheep is a serious factor. Of all the original seedlings, 6.1% were killed by trampling. This represents 29.2% of the mortality. Proof of trampling by sheep rather than cattle or technicians was hard to determine but probably was recorded rather accurately.

In addition 7.1% of the original seedlings were injured by sheep and will die. Were these called dead now the % mortality would be increased considerably.

3. Of the total mortality 56.8% was attributed directly or questionably to sheep (and this was during the middle of summer when death by drought was probably near its peak) Of course this ratio would not hold for each two-week periods of the year as natural death takes place all the time, but death by sheep occurs

only during the few times sheep are on an area. Work was started too late to keep a record of all the mortality from this good natural seedling catch.

The above figures apply to seedlings. The percent mortality of spots is about the same but in most cases slightly lower.

Figures from each of the compartments are very close, indicating that the stand of seedlings under seed trees was rather uniform and that the mortality by the various causes was about the same regardless of the density of stand of seed trees.

The figures on mortality obtained from this transect cannot be applied on an acreage basis as a selected area was sampled--a limited portion of ground under trees.

To get an idea of distribution of seedlings and the difficulty of sampling them, compartment 3, $2\frac{1}{2}$ acres, was sampled with 40 100 square foot plots located at random. A few results are:

1. Thirty-five percent of the plots contained no seedlings.
2. The average number of spots per plot was only 1.48, or $\frac{1}{3}$ of those on the selected plots.
3. Seedlings per spot was 1.7 compared to 2.1 for the selected plots on compartment 3.
4. The average stand was 610 spots and 1056 seedlings per acre examined.
5. Projecting the figures obtained it would require 250 acres sampled with 4000 plots to obtain 5600 spots and 9700 seedlings for observation--a big job.

6. The number of seedlings on 40 plots killed by each cause was too small for computation of reliable percentages and the ones calculated varied considerably from the ones obtained from the larger number of plots and seedlings located near seed trees on this same 2½ acre area.

Several old seedlings, probably 1936 and 1937, were located on the plots and a high percentage of these were eaten by sheep. This indicates that the danger to a good crop of seedlings extends past the first year as far as grazing is concerned although they probably resist trampling better after the first year.

The transect should be grazed again, striving to handle the sheep as they are normally grazed. Probably this should be done about September 1. It would be good if this could be done after a heavy rain so the signs would be more easily read. Also, it is suggested that only vigorous seedlings be left. Probably this would make the reexamination after sheep more easy and would show what sheep do to seedlings well established.