

## 5714 –SEEDING

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- .01 Purpose. This section provides guidelines and standards for reforestation by artificial seeding.
- .02 Objectives. The objective of seeding is to supplement or replace natural seed fall in a manner that will produce the desired stand.
- .03 Authority. (See 5700.03)
- .04 Responsibility. (See 5700.04)
- .05 Definitions. (Reserved)
- .06 Policy. (See 5700.06)

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.1 Seeding Criteria. In contrast to natural seeding, artificial seeding can be timed to coincide with favorable site conditions. It also allows better distribution of stocking and control of species composition, and is an opportunity to increase genetic quality in the next stand. Compared to planting, seedlings established from seed are not subjected to handling injury and reduced growth during the first year. Seeding is less restricted by weather than planting and can often be done successfully on rocky sites, where planting is difficult or economically unfeasible.

.11 Pre-seeding Requirements. Since only small amounts of seed are used in artificial seeding, some form of protection against rodents is nearly always necessary. However, this may also be necessary to obtain optimum stocking by natural seeding in one or two years. Unless care is taken in the selection of seed used, genetic quality of the next stand may be reduced. Seeding usually requires increased site preparation and rodent protection over that needed for planting.

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.2 When and Where to Seed. Seeding is done in late fall and early winter to allow natural stratification of seed. North and northeast exposures with little or no competing vegetation or litter are usually favorable seeding sites. Soft, friable soil is desirable for broadcast seeding since it is generally believed that most established seedlings originate from covered seed.

.3 Seeding Methods.

.31 Aerial Seeding. Aerial seeding is the least expensive method of artificial reforestation. The total amount of acreage available for treatment at one time, however, is critical for obtaining low cost contracts. The rate of application may vary between areas and is governed by seed viability, size of seeds, severity of site, and desired stocking. For fast, efficient seeding, weigh seed into portions required to seed each individual area. Successful application depends upon calm air, cross flying (insofar as topography permits) and accurate calibration of seed dissemination equipment. Do not seed on crusted snow, or on snow so deep that seed will not reach the ground until late in the season.

A. Calibration of Seed Dissemination Equipment. The application rate per acre is determined by rate of dissemination, aircraft speed, and width of swath. Calibration can be checked in four steps on the ground.

1. Use a stop watch to determine the time it takes to disseminate a known amount (lbs.) of seed.
2. Determine the acres that will be treated per minute at the planned flying speed and swath width:

$$\text{Acres per minute} = \frac{\text{swath width X miles per hour X 2}}{1,000}$$

3. Multiply the desired application rate per acre by the result in step 2.
4. Compare the results in step 3 with step 1. Adjust disseminator and recheck if the two are not approximately equal.

Example:

Step 1 – 7 lbs. of seed disseminated in one minute

Step 2 –  $\frac{40 \text{ (ft.) X 45 \text{ (m.p.h.) X 2}}}{1,000} = 3.6 \text{ ac/min.}$

Step 3 –  $3.6 \text{ X } 2 = 7.2 \text{ lbs./min.}$

Step 4 – The 7 lbs. disseminated in step 1 is .2 lbs. short of the 7.2 lbs. in step 3.

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- B. Application of Seed. Seed half of the seed for a particular area in one general direction, and the remainder at right angles to the first flight strips insofar as topography and shape of the area permit. Where more than one species is to be sown, load species in separate hoppers. Fly at a uniform height above the ground between 100 and 200 feet and a speed of 45 to 50 miles per hour, insofar as conditions permit.

.32 Hand Broadcast Seeding. Hand broadcast seeding is used to the best advantage wherever a high degree of accuracy is required in dissemination. Areas with large amounts of unseedable places distributed through the seeding area are examples.

.33 Spot Seeding. Seed spotting is done only when there is a real need to cover the seed. This need usually exists when large seeds such as sugar pine are being sown, when soil is compact or crusted, or if rainfall is not sufficient to cause soil movement in fall and early winter. The number of seed spots per acre usually equals the desired number of trees per acre, but this may be increased if site conditions are not ideal. The number of seeds sown per spot varies according to seed viability but usually falls within the following range:

<u>Species</u>	<u>No. Seeds Per Spot</u>
Sugar Pine	2-4
Western white pine	8-12
Ponderosa pine	6-10
Lodgepole pine, Douglas-fir, true firs	8-15
Spruce, hemlock, larch & cedar	12-20

- A. Spot Selection. One advantage of seed spotting is the opportunity to select the microsite for each spot. Selected spots should be in partial shade and protected from sloughing bark or soil. Avoid seeding excessively wet spots, drainage channels, or soil deposited on top of debris. Other microsities to avoid include compacted soil, dense vegetation, under large logs, and on animal trails. Clear spots to mineral soil, and cover to a depth equal to the longest diameter of the seed. Lightly firm the soil over the seed but do not compact.