Mesquite Seeds Live A Long Time

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Velvet mesquite (*Prosopis juliflora* var. *velutina*) reduces grass forage, and some Arizona ranchers are spending hard cash to control it. The rate of re-invasion by mesquite following an effective control job depends largely on how fast new trees are established from seed.

Even if no new seeds are brought into the cleared area, some new mesquites may emerge from seeds present on or in the soil at the time the parent trees were killed. A study now under way at the Santa Rita Experimental Range shows that some mesquite seeds remain viable in the soil for many years.

Seeds Lived 50 Years

The first clues came with the discovery that mesquite seeds from a 1903 herbarium sheet were 60 per cent viable, after 44 and 50 years. However, this bit of information shed no light on the longevity of mesquite seed in soil.

To get a better evaluation of the longevity of mesquite seed under natural conditions, known numbers of mesquite seeds were placed in the soil in fenced enclosures in August 1948. Tests were made at elevations of 3000, 3800, and 4000 feet, where the mean annual rainfall approximates 12, 15, and 17 inches, respectively. The three areas are generally similar in plant cover and slope exposure.

All seeds used in the study were collected from two trees in 1948. Germination tests on moist filter paper in petri dishes resulted in 76 per cent germination of hulled seed without scarification and an additional 20 per cent after scarification, or a total of 96 per cent. None of the seeds still in pod segments germinated.

Two kinds of field tests were made. In the first, three 50-seed lots each of hulled seed and seed in pod segments were planted at each location to determine the time sequence and percentage of germination under natural conditions. These seeds were planted in August 1948, after the summer rains were almost over. Per cent emergence data averaged for the three sites follow:

HULLED MESQUITE seed and seed in pod segments. Upper left hand lot is covered with an inch of soil. The other five lots were later covered in the same way.

Year	Seed in pod segments (per cent)	Hulled seed (per cent)
1948	0.0	0.9
1949	35.1	8.9
1950	8.7	4.9
1951	0.9	0.7
1952	0.0	0.0
1953	0.0	0.2
1954	0.0	0.2
Total	44.7	15.8

Germinated in First Few Years

More of the seeds in the pod segment than hulled seed germinated, and they did so more readily. Most of the germination occurred within the first three growing seasons. No seedlings emerged from the pod segments after 1951. From the hulled seeds, one seedling each was obtained in 1953 and 1954, but none have been observed since. There is no measure in either case of the number of seeds still in the ground that may germinate in the future.

In the second study, lots of 50 hulled mesquite seed were planted in one-pint jars partially filled with soil. These lots of seed were dug up after two, five, and 10 years of burial to determine (1) the number of apparently sound seeds remaining, and (2) their viability. The data that follow are an average of the three sites.

Years after burial	Apparently sound seed recovered (per cent)	Viability of apparently sound seed (per cent)
2	63	89
5	47	89
10	10	86

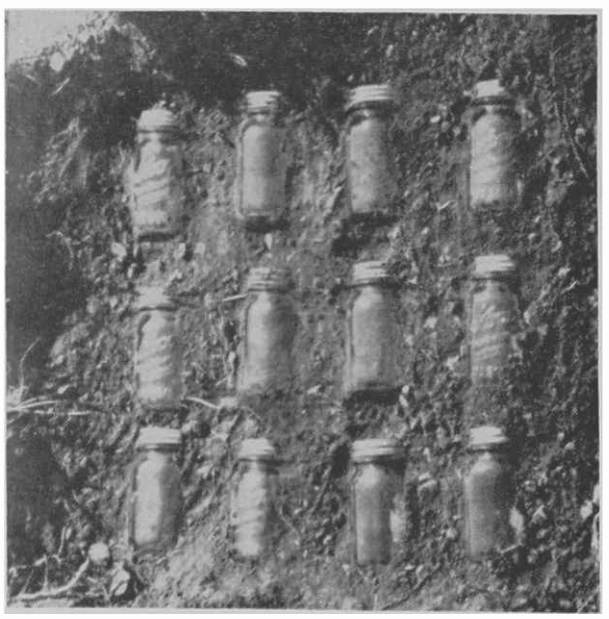
One recently germinated seed was found at the time of the 10-year observation, which shows that mesquite seeds can remain alive 10 years in the soil and still be capable of sprouting under more or less natural conditions.

The final observation in this study is scheduled for 1968, when the remaining jars of seed and soil will have been buried 20 years.

Reseeding is Continuous

It is apparent that a single clearing job will not rid an area of mesquite. Even if no new seeds are carried in, continued emergence of mesquite seedlings may be expected for several years. However, the biggest threat from buried seed is during the first two or three growing seasons after clearing. After that, occasional mesquites may emerge from old buried seeds, but the number of trees that will be established probably will not be great.

PINT FRUIT JARS containing lots of 50 hulled mesquite seeds mixed with soil. Blotter paper caps held in place by jar rings allow moisture to enter the jars. The jars were embedded in soil.



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