

GERMINATION TRIALS OF JUNIPER SEED

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Work conducted over the past 6–7 years to obtain juniper seedlings has provided lot of information regarding germination behaviour of seed. It has been found that the percentage of filled seed decreases as the berries mature; large number of seeds are empty because there is no embryo formed; the seed is eaten by insect; there is high tree to tree and locality to locality variation in the percentage of filled seed. Scarification with H_2SO_4 for various periods (5 min.–60 min.) and stratification at $5^\circ C$ for 90–120 days, keeping in boiling water and soaking in water for 24 hours did not improve germination.

Collection of seed

Seed can be collected from November to the end of December when it starts getting black. The localities are Sasnamana, Wam, Kotal, Kharwaribaba, Bastargi, Karbi Kueh, Chutair etc. Seed should be packed in gunny bags and transported to the nursery site.

Graduation of seed

The ripe berries are of different sizes and can be graded into 5 grades as under:

- Grade 1 Did not pass through sieve of 12x12 mm mesh
- Grade 2 Passed through 12x12 but not 10x10 mm mesh
- Grade 3 Passed through 10x10 but not 7x7 mm mesh
- Grade 4 Passed through 7x7 mm mesh.

Four grades have the following attributes:

Attribute	Grades			
	1	2	3	4
Average diameter cm ¹	1.1	0.9	0.8	0.6
Average number of berries ² in 100 gram	133	282	370	410
Average weight of seed (grams) from 10 gram of berries	1.4	1.4	0.9	1.1
Average number of seed ³ in one berry	4	4	3	2

- Two diameters at right angles taken of each berry in the random samples of fifty berries each with vernier calliper.
- Average of 10 random samples
- Average of 10 berries in each lot.

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Seed extracted from berries of grade—1 can be separated into the following size grades by sieves of different meshes:

Grade	Size of sieve (micron)	Average length of seed (mm)	Average width of seed (mm)
1.	Over 400	6.14	4.99
2.	3360 to 4000	5.94	4.20
3.	2820 to 3360	5.53	3.49
4.	2380 to 2830	5.31	3.16

Sample size: 10 seeds for each grade.

Average number of seeds per gram is 32.

Germination percent of the Seed

The conclusion of work on seed germination till 1980 is that it is highly variable from tree to tree. The usual range is from 0 to about 6%, with one exceptional value of 11% recorded from one tree in the study. The average germination percent for different localities are given below:

Locality	Average	Standard deviation
Ziarat	0.83	0.64
Sasnamana	0.99	0.94
Koshki	1.32	1.80
Wam	2.27	1.43
Karbi Kach	0.84	0.69

Sowing of Seed

As soon as berries are collected these have to be depulped by rubbing them on a mesh with a stone. This seed has then to be washed thoroughly in running water and cleaned properly so that the pulp is washed and clean seed is available. This seed is placed in a dish for 24 hours in water. The empty seed comes on the surface and has to be discarded. The sunken seed is available for sowing either direct in tubes or beds. If it is decided to sow the seed directly in tubes, it is sown in 50 : 50 sand soil mixture in 20 x 8 centimeter tubes with 50 perforations, 10 seeds to each tube. If it is sown in beds, which is a better method, beds are kept 30 x 90 centimeter and are prepared from 50 % nursery soil and 50 % sand. The seed is sown in 5 centimeter apart lines and covered with sand. It is imperative to put a wire mesh gauge on the beds as the germinating seedlings are pricked and damaged by sparrows and rats. The beds as well as tubes are kept moist till germination is complete. While in the case of tubes hand watering is to be done, beds are kept moist by allowing the water run around the same.

Transplanting

Germination usually starts after 60 days and continues from December to March. There is no germination in May and June. Germination starts again with the onset of monsoon and continues for another 2 years on the same pattern.

The seedling has 2 leaves in the beginning but after 30 days the third and fourth leaves also appear and a rosette is formed. At this time the seedling should be pricked with great care taking the entire root system alongwith and transplanting the same in polythene tubes. The tubes have to be watered on alternate days for about 3 months and later twice a week. Work of raising juniper nursery was first of all started at Ziarat. It was found that not only the growth was extremely slow but also most of the young seedlings could not survive in the cold winter at Ziarat. Nursery work was, therefore, shifted to Peshawar. Since seedlings could not stand the extreme heat of May and June, these were shifted to Abbottabad where these were kept for two years. Since it has been proved through a number of studies, that less than two years old seedlings do not survive in the field it is suggested that only 2-year old or more, seedlings be planted out.