

PROPAGATION OF ALBIZIA JULIBRISSIN

Natural dispersal of *Albizia julibrissin* seeds take place during late fall and into winter. Pods, which develop in clusters, are firmly attached to the tree and require high winds to tear them loose, with the result that they can be found lodged against obstacles some distance from the mother plant. This method of distribution allows wide latitude in time of pod collection, quite unlike many fruits which must be harvested immediately when ripe. The suspended clusters of pods can be gathered quickly, a handful at a time. Blooms from which the pods develop open from early July to mid-September. Because of this long flowering period, seeds in various stages of development will be found at the time of collection. Those which arose from flowers early in the season will be plump and ripe while others from late flowers will be immature.

Seed Longevity

When pods of *Albizia julibrissin* have reached maturity and are about to change from green to straw-color, the coats of the seeds within consist of thin, soft membranes. At this stage they offer no barrier to germination and seedlings appear shortly after the seeds are sown. But as ripening continues, the seeds are reduced to about one-third their original weight and develop flinty-hard water-impermeable coats. When sealed from moisture in this way, respiration takes place at such a low rate that viability is retained for a remarkably long time when conditions are unfavorable to germination. In 1964 a few seeds from one of our own herbarium specimens that had been prepared in 1897 were treated with hot water, and one germinated after having been kept for 67 years under the dry conditions of an herbarium.

Inducing Germination

Germination of *Albizia julibrissin* seeds is hindered only by impervious seed coats that retard the entry of water. If seeds are not pre-treated before being sown, germination can occur erratically over a period of many years. Pretreatment can be done by mechanical scarification, acid scarification, or hot water treatment.

Mechanical scarification. In small quantities, seeds can be held between the fingers and scraped along the upper edge of a small, sharp, three-cornered file laid on a table top. When seeds are being processed in large volume, their coats can be abraded in scarifying equipment designed for this purpose.



PLATE XII

Seed coats of *Albizzia julibrissin* can be modified enough to permit germination by treating the seeds with water heated to 190° F. Resulting germination is shown.

Sulfuric acid treatment. Sulfuric acid treatment consists of placing the seeds in a glass container and carefully pouring concentrated sulfuric acid over them until they are covered. After a set period of time, the seeds are rinsed very thoroughly in running water for several minutes and then sown.

When the germination requirements of *Albizia julibrissin* seeds were being investigated at the Arnold Arboretum several years ago, sulfuric acid treatments of $\frac{1}{2}$ hour, 1 hour, and 2 hours produced similar results, the longer treatments being neither beneficial nor detrimental. Each produced uniform germination in about 10 days.

Hot water treatment. Seed coats can be modified enough to permit germination by placing the seeds in a container and pouring water heated to a temperature of about 190° F. over them (Plate XI). It is important that the volume of water be at least 5 or 6 times the volume of seeds, for too small a quantity would cool before it had the desired effect. Seeds are left in the water overnight and then sown at once. A somewhat less effective method is to sow the seeds and pour boiling water over the seed pan or flat. In our tests hot water and acid treatments produced similar results, but with hot water the precautions necessary when working with acid were avoided.

Vegetative Propagation

By 1966 the Arnold Arboretum's 47-year-old type specimen of *Albizia julibrissin* 'Ernest Wilson' showed signs of senescence and its propagation became necessary. In order to perpetuate the clone, asexual or vegetative propagations had to be made. Seedling propagants would have been unsatisfactory, for seedlings are genetic individuals and therefore could have characteristics differing from those of the parent plant. They might, for example, lack the inherent hardiness that is the principle attribute of this clone.

Albizia julibrissin does not propagate from ordinary stem cuttings but can be reproduced from root cuttings taken in late winter or early spring. Commercial nursery practice is to take root pieces in spring and line them out in nursery rows. To propagate *A. julibrissin* 'Ernest Wilson', root pieces about $\frac{1}{2}$ inch in diameter and 3 inches long were placed vertically in pots using a loose medium composed of sand and peat moss. This was done on March 11 and by May 23 shoots began to appear. In most cases multiple shoots developed. As propagators know, shoots that arise from roots are physiologically juvenile, even though the parent plant may have lost its juvenility years earlier. These will frequently root despite the fact that stem cuttings from the same plant will not. With this in mind, the excess shoots were removed and inserted as cuttings. In eleven days all were well rooted. This success led to an experimental project intended to test the feasibility of producing juvenile shoots from roots in quantity.

Root sections of larger size were placed horizontally in flats of sandy soil. This



PLATE XIII

Root sections of *Albizia julibrissin* placed horizontally in sandy soil give rise to juvenile shoots (top) that can be removed and will root quickly. If left attached to the root pieces, these shoots will root in place (bottom).

procedure worked well — three root pieces, one inch in diameter and from 5 to 12 inches long, led to a crop of 52 shoots (Plate XII). After the first shoots were removed, the root pieces were returned to the flat and a second but smaller crop developed. These were left in place and eventually produced roots of their own while still attached to the root piece. Use of large root sections to produce rootable cuttings provides a method by which desirable *Albizia julibrissin* clones can be propagated quickly. Included among these would be cultivars selected for resistance to the mimosa wilt disease that has been troublesome in the South in recent years.

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