

OHIO EXPERIENCE WITH BLACK WALNUT TUBLINGS

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There are three state nurseries in Ohio operated by the division of Forestry & Reclamation - Marietta, Green Springs, and Zanesville. Two of these nurseries, Marietta and Green Springs, have been involved in walnut production. Because of excessive growth at Marietta, our most southern nursery, walnut production in recent years has been concentrated at the Green Springs nursery. Annual sales of walnut seedlings averages around 250,000. In addition to these seedlings, several bushels of stratified nuts are sold each year. The results of planting seedlings or nuts have in many cases been disappointing. In some cases poor survival may be due to planting on the wrong site. It may also be due to the planting of inferior stock. The cutting of the tap root during lifting' causes the root system to be out of proportion to the top and may cause die-back. There is also the danger of root rot fungi entering the wounded area and causing stunting or death of the seedling.

The planting of stratified nuts on good walnut sites might seem to be the answer. However, results obtained from this method of reproduction are also, oftentimes, disappointing. The planter may not take the necessary precautions to protect the nuts from drying out or in protecting them from rodents. Poor germination may result even though the seed is properly stratified. Following germination, the small seedling will be very susceptible to drought condition or affected by competition from nearby vegetation.

We have long been aware of the above problems associated with black walnut plantings. Our farm foresters are even becoming reluctant to advise the planting of walnut due to poor survival experienced by walnut growers.

A paper on Tubed Seedlings, published in September 1967 by Leroy Jones of the Eastern Tree Seed Laboratory, aroused our interest as a possibility of producing better walnut seedlings, at least on a small scale by this method. In order to get first hand knowledge and experience to base a later walnut seedling program upon, we attempted to duplicate the method used at the seed lab.

We ordered 1,000 Kraft paper tubes with water resistant adhesive. The tubes were 1-1/2 inches in diameter and 10 inches in length. Crates, measuring approximately 15 by 18 inches, were built to accommodate 100 tubes. The potting medium used in the tube consisted of 4 parts vermiculite, 2 parts soil, and 1 part peat. The dry material was hand mixed in a wheel barrow to obtain a uniform mixture. A large funnel with a spout a little less than 1-1/2 inches was used in filling the tubes to the very top. It was found that a section of 1 inch dowel could very handily be used to press the loose material down into the tube to allow space for the walnut and the necessary soil on top. After all the tubes in the crate were filled and the soil compacted within the tube, a sprinkling can was used to wet the material thoroughly.

Stratified walnuts obtained from the Green Springs Nursery were used as the seed source. The nuts, which had been transferred to Marietta in the early spring, had been repacked in wet moss and placed in cold storage until ready for use. A nut was placed in each tube with the suture in a vertical position. Approximately 1/2 inch of soil material was put into each tube over the seed thus bringing the level to the top of the tube. The filling material was then wet down thoroughly and the crate was placed in a small green house on the nursery for germination. Germination started in approximately 2 weeks . After it was well underway the crate was moved to an outdoor lath house which furnished 50% shade. We found that germination was around 67% in our first crate, but that the period of germination ran from 2 weeks to well over a month. We felt that the resulting uneven height growth was not desirable. If the crate were to be shipped as a unit, some of the trees would be too small and tender to be planted while the larger ones would already have extended their roots through the bottom of the tube. The seedling could always be sorted as to size, but this might not be practical in a large operation.

A test was planned to try to obtain more uniform germination. An inch thick layer of peat moss was placed in the bottom of a 2 foot square wooden flat. Stratified walnuts, which had been kept in the cooler, were then pressed into the layer of peat. The flat was then placed in the green house under an automatically controlled mist nozzle which kept the nuts moist at all times. Adjustments were made in the ventillating system so as to keep the temperature

within desired limits. The flat was checked periodically for signs of germination. When the nuts started to swell and crack along the suture, they were placed in wet peat moss , rolled in burlap, and then stored in the cooler.

Our next tubed seedling experiment was started about three weeks after the first of the nuts in the test had shown signs of germination. The tubes were prepared as previously and placed in the lath house for germination. Seedlings had begun to emerge before the second week. Germination was complete within two more weeks thus giving a more uniform height in this group of seedlings. There has been some mortality after germination in our tests. Some was due to disease and some may have been due to constriction within the tube. We found that the 1-1/2 inch tubes are not large enough for some of the nuts. We have ordered 2 inch tubes for further testing.

Walnut seedlings produced in our tests have been planted on the nursery as well as on private ground by farmers we contacted who had bought walnut seedlings in the past. The first group of seedlings were planted July 4. Others were planted at intervals throughout July and August. Survival has been almost 100% even though the trees were planted well past the normal spring planting season. The farmer's comments concerning the seedlings and survival has been very favorable. The seedlings planted this summer will be checked again in the spring for mortality and dieback.

Along with the regular collection of walnuts for seed this fall, the three State nurseries will collect a few bushels of nuts from what we would call superior trees . These particular nuts will be kept separate, labeled as to source, stratified and then used exclusively for tubed seedling production next spring.

Our production plans at this time are indefinite. It is expected that since a lot of walnut plantings are on a small scale and that this species has such a high potential value, many planters will be willing to spend the extra time and money to establish their plantings with tubed seedlings. The advantages of planting over a longer period of time and prospects of better survival, should help to influence them in this direction. We would plan to go into this program on a small scale and increase production as demand warrants. Once the program is started, we could increase production to seasonal demand very quickly as only a few weeks are needed to produce seedlings by this method.