

REVEGETATION WITH NATIVE WILLOWS AND POTENTIAL MARKETS

Nancy J. Moore, Department of Natural Resources, Division of Agriculture, Alaska Plant Materials Center - A Presentation Made at the 1988 Alaska Greenhouse and Nursery Conference.

The Alaska Plant Materials Center (PMC) has been evaluating native willows and poplars since 1975. Plants are evaluated for vigor, hardiness, resistance to disease and insects, appearance and phenology. Numerous collections of each species are compared with each other. Evaluations were conducted solely at the PMC until 1979, when cuttings from the best performing accessions were placed in windbreaks on various farms in Southcentral and in the Interior. In 1980, the PMC began evaluating willows and poplar in non-agricultural situations, such as mine sites and other industrial disturbances.

In addition to evaluating the performance of these promising collections of willows and poplars in offsite locations, three planting techniques: dormant cuttings, rooted cuttings and bundles were also evaluated. I would like to briefly discuss these planting techniques in the context of revegetation with willows and poplar. My descriptions are taken from a Streambank Revegetation brochure produced jointly by the PMC, Division of Parks, and Department of Fish and Game.

Dormant cuttings are taken in the spring before bud break and are kept in cold storage until they are planted. The cutting is 8 to 10 inches long and 1/4 to 3/4 of an inch in diameter with visible buds. The advantages of the dormant cuttings are that they are easy to prepare and plant and are low in cost. The disadvantages include: 1) the cuttings must be kept frozen or refrigerated until planted; and, 2) care must be taken while they are in storage so that the cuttings do not become dessicated or moldy. Also, more dormant cuttings must be planted at a site than rooted cuttings because fewer dormant cuttings become established. Relatively moist sites are required for planting, particularly during the early stages of establishment; and finally dormant cuttings can only be planted from early spring through July 1 in order to insure that they become sufficiently well established to survive the winter. When planting a dormant cutting, three-fourths of the cutting should be placed below ground with only one to two buds appearing above the ground surface. This reduces the possibility of dessication and maximizes the surface area for rooting.

Rooted cuttings are dormant cuttings that have been rooted in a controlled environment, cold frame or the field before they are planted at a site. The advantages of the rooted cutting include: 1) the healthiest cuttings can be selected for planting; 2) older or more developed plants can be used for a revegetation project (we have found that 1 - 0 stock performs better than cuttings rooted the same year that they were planted out); 3) rooted cuttings become better established at drier sites than bundles or dormant cuttings; and, 4)

The disadvantages of rooted cuttings are that they are more costly and time consuming to prepare than dormant cuttings, and require more care when transplanting.

Bundles are a collection of dormant branches 1/2 to 1 1/2 inches in diameter and approximately 4 feet long. The branches are tied together with twine or wire into bundles about 4 inches in diameter. The branches are put together so that the growing points are oriented in opposite directions. The bundle is planted horizontally in a shallow trench that is cut sloping back into the hillside. The bundle is staked into place and the soil or substrate is brought over the top and tamped into place. A small shelf is formed which serves as a small catch basin for water. Approximately 3/4 of the surface area of the bundle should be covered. Usually the bundle will root and produce shoots along the entire length of the bundle. Advantages of this planting technique include: 1) cover can be produced quickly and even if the bundle does not become established, it will provide physical protection to the slope; and, 2) the bundle is very effective in reducing soil erosion and is an important revegetation technique, particularly for sensitive areas such as streambanks. Often bundles are interplanted with rooted or dormant cuttings.

Disadvantages of bundles include: 1) they must be kept in cold storage without becoming dessicated or moldy until they are planted; 2) they require large amounts of plant material; and 3) like the dormant cuttings, they can be planted only from early spring through July 1.

In 1985, after evaluating several willow species for ten years, the PMC decided to release five species as named varieties and make them available to growers. The willow varieties first became available to the public in 1986.

Probably the easiest of the willow varieties to work with is 'Rhode' Feltleaf willow, or Salix alaxensis. This species roots very readily, and is an excellent choice for any of the planting techniques described earlier. Feltleaf willow is a floodplain species and is well suited for streambank restoration. It is also a preferred browse species for moose and snowshoe hare.

'Oliver' Barrenground willow, or Salix brachycarpa, is one of the two varieties that we think has ornamental value. This shrub grows to moderate height, approximately eight feet; the leaves have a grayish cast and the species has worked very well as a hedge at the PMC. The branches, however, are somewhat brittle and can break under heavy snows which we have experienced this fall. The species has worked well in revegetation situations, and probably works best as a rooted cutting.

Another variety with ornamental value is 'Roland' Pacific willow. This is a treelike willow with long, narrow, glossy, green leaves on the upper surface. The lower leaf surface is a dull green. A visitor to the PMC once called it the Alaska Bamboo willow. Like Feltleaf willow, Pacific willow is also a flood plain species and is an excellent choice for restoring streambanks. We have not observed any signs of browsing on our Pacific willow plants at the PMC, so this species would be a good selection if you do not want to attract moose to the plantings. Pacific willow can also be used with all three planting techniques.

'Long' Barclay willow is another excellent candidate for habitat enhancement. Barclay willow is one of the preferred browse species for moose on the Kenai Peninsula. Barclay willow roots readily and can be used in all three planting techniques.

'Wilson' Bebb willow is commonly found in forested habitats and fencerows throughout Southcentral. It is a good choice for windbreak. Bebb willow has not been browsed heavily by moose at the PMC. This species should only be used as a rooted cutting.

Propagation of all of these willows is relatively simple. At the PMC, we root the cuttings in a sand mist bed that is heated to 72° F. No hormone treatment is applied to any of the willows except Bebb willow. We have succeeded in rooting Bebb willow without a hormone treatment, but we have also applied light treatments of Wood's Rooting Compound and Dip and Grow on separate occasions. Our records show no important differences between treatments.

The evaluation process of planting various willows and the testing of planting techniques throughout the state, has stimulated considerable interest in using willow for various revegetation plantings. For several years the PMC has provided small quantities of various willows to industry, state and federal agencies to enhance their revegetation efforts and to also provide the PMC test sites for the willows. In this way the plants have been tested in many diverse conditions.

The demand for willows has now exceeded what the PMC can provide. The PMC is also interested in encouraging the private sector to take over the production of the willow varieties. Some growers have purchased the willow varieties, but they have been growing them a very short time and they are not yet ready to meet the current demand for willows. To meet the major request for rooted cuttings for 1988 and to try and get the private sector involved in willow production, a plan has been developed. The request came from the Municipality of Anchorage which wants to develop a plant materials bank of several thousand plants. This bank will serve as a source of plants of known species, quality and quantity that are suitable for use in revegetating streambanks. The plants will be used in the Municipality's Clean Streams Partnership Program or will be provided to Municipal contractors who have disturbed a streambank which must be revegetated.

At present, the Municipality hopes to operate the bank for three years; that is for 1988, 1989 and 1990. The Municipality would prefer to have 1 - 0 cuttings, but since they got a late start this year, they will settle for cuttings rooted this spring for the 1988 growing season.

The request for bids to produce 3,000 Pacific willow cuttings and 1,000 poplar cuttings for 1988, will go out the week of February 15, 1988. The PMC has worked with the Municipality on this contract and has agreed to sell to the successful bidder, dormant cuttings of willow and poplar. The Municipality wants the cuttings to be rooted in deep pots which they will provide to the grower. Specific questions and requests for the RFP should be made to Vince Fennimore of the Municipality; his telephone number is 343-6972.

The Municipality has already made arrangements for the production of 1 - 0 cuttings for 1989, but there is a good chance that 1 - 0 cuttings will need to be produced for 1990 and a commercial grower should be able to produce that plant material. A lot will depend on how the contract goes this year.

Other potential markets for willow cuttings include revegetation work that is being planned by ARCO Alaska on lands adjacent to the Kenai Moose Range in the next year or two. When Diamond Alaska Coal receives a permit that allows them to begin mining, they will need native material for revegetation. Usibelli Coal Mine in Healy, probably will be embarking on their woody revegetation plan in the near future and DOT has recently expressed interest in using willows for a special project. Another project may be the moose habitat mitigation work that will probably be conducted in conjunction with the Bradley Lake Hydroelectric Project. There are no guarantees as to when plant materials will be needed or how much will be needed, but the Plant Materials Center will continue to try and help the producer meet the needs of the consumer.