

Evergreens at Dickinson Agricultural Experiment Station¹

By T. J. Conlon²

Evergreens at the Dickinson Experiment Station have attracted much attention and generally favorable comment from visitors in recent years.

Colorado blue spruce, Black Hills spruce, Ponderosa pine, Scotch pine, Western Red Cedar, Creeping Cedar, and Bush Juniper are the varieties which have proven to be the best adapted. Early plantings including Jackpine and some other varieties which proved to be unadapted. Pfitzer Juniper has also proven hardy here in good locations when they can be watered in the fall before freezeup.

BULLPINE

Bullpine, Ponderosa pine, or Western Yellow pine is one of our best adapted trees. It is sometimes difficult to start in the seedling and transplant stage but it is rugged and withstands severe drought and cold after it is three to four feet high. It is one of the fastest growing evergreens after it passes the first few seasons in its permanent location. Loss of Bullpine after the first five years of establishment has averaged less than one per cent per year, including the drought year of 1936 at this station.

Many of the earliest plantings of Bullpine on the station were in 1909³ and the largest trees of this planting are 16 inches in diameter and 40 feet high. They are the only survivors of a planting which originally included Jackpine and Black Hills spruce, both of which have been gone for about 20 years.

Since the Bullpine is such a rapid grower and its roots have been shown to extend fully 50 feet and depress the growth of crops planted within that distance, it probably is best to plant in solid blocks rather than in rows in a shelterbelt adjoining a less aggressive species.

Bullpine in the 1938 planting had reached a height of 14 feet in 1949. These were established at the beginning of a series of very

¹The material for this article was assembled by former Supt. Leroy Moomaw, Mr. T. J. Conlon edited it and cast it into its present form. Former Supt. L. R. Waldron was responsible for the earliest planting of trees. Mr. Leroy Moomaw, who became superintendent of the station on April 1, 1919, and who served in that capacity until Sept. 30, 1950, was particularly interested in evergreens and must accordingly be credited with the many beautiful plantings made during his superintendency.

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³The Dickinson Agricultural Experiment Station was established by an act of the 9th Legislative Assembly of the State of North Dakota, approved March 2, 1905. L. R. Waldron was named its first superintendent. With the assistance of the late C. B. Waldron, who in 1890 had been named arboriculturist (tree specialist) of the North Dakota Agricultural Experiment Station, a plan for the layout of fields, gardens, orchards and lawns was developed. In his "First Annual Report for the Year 1908" Supt. L. R. Waldron wrote "A number of pine and spruce trees have been set out, and, while the Bullpine and Black Hill spruce have done fairly well, yet not enough time has elapsed to determine if they can be raised here to advantage. If they are to be tried, only small trees should be purchased". Dr. L. R. Waldron, now plant breeder at the main station at Fargo, distinctly recalls that some Bullpines were planted previous to 1909, probably in 1906, '07 or '08. (H.L.W.)

favorable years and growth has been above normal. These trees are adapted to the tough clay of the Badlands, the good loam soils and also to sandy situations, if they can have a fair amount of protection during the first few years until the seedlings become established. Bullpine has grown more rapidly than Colorado blue spruce in adjacent plantings. Bullpine, at this station, have had little or no disease or insect damage. Earlier plantings had many of the branches on the lower 10 feet killed by the pine "tip moth". The larva of this insect bores into the buds, killing many of the terminal shoots. An infestation about 15 years ago cleared up after a while and little or no effect of the insect has been observed since.



Fig. 1. Colorado Blue and Black Hills Spruce planting at the Dickinson Experiment Station—July, 1949. This planting was started in 1934. (Photo by W. P. Sebens, GNDA.)



Fig. 2. The same planting as shown in Fig. 1 as it appeared in 1941. (Photo by Leroy Moomaw)

Bullpine should be transplanted when small, as the tree develops a strong taproot which makes it difficult to move after the trees have made two or three feet of top growth. When trees are three to four feet high it is desirable to dig very carefully and remove a block of dirt two feet in diameter and two and one half feet or more in depth. This makes moving very difficult. Trees larger than four feet high are extremely difficult to move without the soil falling away from the roots. When this happens such trees may not survive the moving.

Bullpine is a strong grower and in good locations probably will reach greater size than any other native tree which can be grown here. In locations where it can reach maturity it will require a larger space than any other adapted evergreen. In solid blocks for a wind break or as inside or central rows in a shelterbelt it will eventually make a good showing.

SPRUCE

Spruce plantings at this station, including both Black Hills, (*Picea glauca*) and Colorado blue spruce, (*Picea pungens*), made in 1923, 1932, 1937, 1938 and 1948 have made exceptionally fine growth, trees in the 1923 planting averaging over 23 feet in height, the 1932 planting averaging more than 16 feet and the 1937 and 1938 plantings averaging 8 to 12 feet or more in height, which makes the annual average growth of this species about 9 inches per year.

Colorado blue spruce has proven most hardy of the spruce grown. It is one of the most beautiful of all evergreens and is frequently selected for planting on lawns and landscapes. Colorado blue spruce survived the drought of 1936 with less loss than other spruce, but it should be mentioned that no trees of this species over 10 years of age were growing on the station at that time.

JUNIPERS

Badland cedar, *Juniperus scopulorum*, has been used in increasing numbers in recent years for plantings about the station. This tree is very hardy, attractive in appearance and grows more rapidly under good conditions than commonly supposed. A solid block of 600 Badland cedar planted in a shelterbelt at the Dickinson Experiment Station in 1940 on a sandy soil, averaged slightly over 6 feet high at the end of the 1950 growing season.

Bush juniper, *Juniperus communis*, is an attractive, hardy evergreen which grows only two to three feet high. It is too low for effective use in a farm windbreak but can be used as an ornamental. Its bluish white berries which are larger than those of the upright form of the evergreen add to its attractiveness. This form has an interesting variety of color, shape and size as well as seasonal range in color.

Trailing juniper, *Juniperus horizontalis*, the low trailing cedar which is often seen covering the slopes in the Badlands and elsewhere in this region is very hardy, long lived, and spreads exten-

sively in some situations. On slopes and embankments it forms an attractive ground cover. This species is sometimes difficult to transplant when parts of the plant are dug in the Badlands. Well rooted seedlings, three to five years old, when moved with a fair amount of soil about the roots can be transplanted as easily as other species. This attractive, low spreading evergreen forms a dense mat and is ideal where a perennial cover is needed for banks or slopes, or wherever taller forms may not fit.

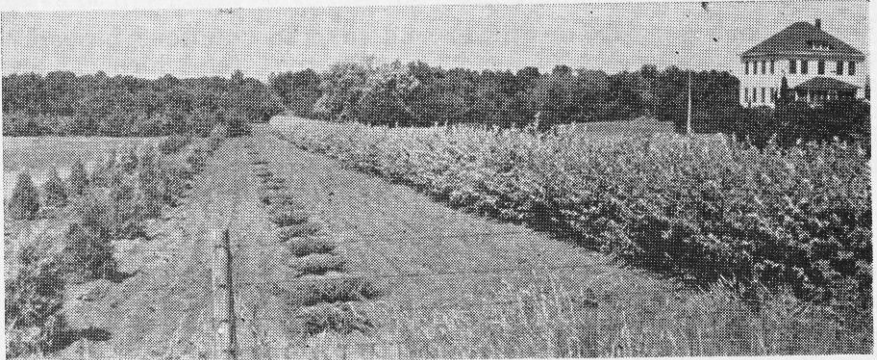


Fig. 3. Western Red Cedar (left) and Bush Juniper (center) in 1943. These evergreens were transplanted the previous season.

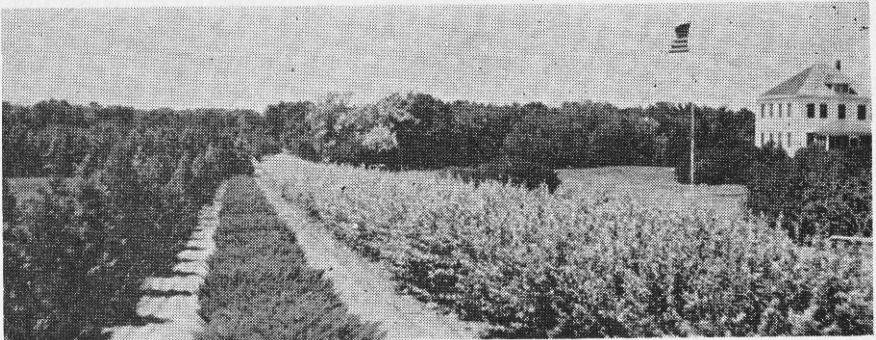


Fig. 4. Same planting as shown in Fig. 3 as it appeared in 1949. (Photos by Leroy Moomaw)

Pfitzer juniper, *Juniperus pfitzeriana*, an attractive low growing evergreen has been used little at the station but where planted at a few places in the district it has provided a most satisfactory addition to the limited group of adapted evergreens. It may be seen on the grounds of the Stark county courthouse in Dickinson and at the West Plains Motel, planted in 1941, where about 20 plants are still doing well. Plants of this species tend to spread widely and need to be trimmed to confine it to limited bounds. Plants vary in height and spread so that by judicious trimming they may be shaped to the space available. Pfitzer juniper has not been more susceptible to winter browning than other evergreens here. All species appear to have gone through recent winters with less winter injury than evergreens in central and eastern North Dakota.

CULTURE AND CARE

Experience with evergreens at the Dickinson Experiment Station shows that in dry seasons these trees may be difficult to establish and a high percentage of seedling transplants may be lost. A good practice is to plant 6 to 12 inch seedlings early in the spring in a good sandy loam or silt loam garden soil, spacing the plants about 12 inches in rows 4 feet apart for easy cultivation.

The seedlings can then be transplanted in a year or two when moisture conditions are favorable. When such young seedlings are transplanted early in the spring with a small block of soil at the roots, a survival of nearly 100 per cent may be expected. This system has worked well with all evergreens as well as small deciduous trees.

It is important that the lined out seedlings be moved within a year or two while small or they become crowded in the nursery rows. After more than two years in the row, the trees when moved must have more soil about the roots and the labor necessary for



Fig. 5. View of a block of Badlands Cedar planted in the spring of 1940, taken in November, 1940. The seedlings are barely visible.



Fig. 6. View of the above planting as it appeared in 1949. These trees averaged 6 feet in height at the end of the 1949 growing season. (Photos by Leroy Moomaw)

transplanting is greatly increased. Seedlings to be left to grow for three or four years or longer should be spaced wide enough to permit the plants to grow without crowding.

Western yellow pine has been difficult to start in unfavorable seasons. When the young trees have become well rooted after a season or two in the nursery row they can be moved with little loss if transplanted early in the spring with a small block of soil about the roots.

For the first few years weeds and grass are kept out of the trees by cultivating as frequently as needed. It is usually necessary to go through the trees with a hoe one or more times during the season to remove weeds in the row which cannot be reached with the cultivator. After the trees become large enough to shade the ground and cover most of the intervening space, cultivation no longer is necessary.

Nearly all of the trees at the Dickinson Experiment Station have been planted in the spring. Average time of planting has been around May 10. These trees may be planted anytime after the frost is out of the soil to the depth of planting. Early planting or transplanting will usually favor young trees. Root development will usually start by April 15 or earlier if the tree is in the soil. Many of the trees are planted later, and trees are successfully moved each year up until early June. In such cases, there is fair chance of survival if the season is favorable, if the trees are moved carefully, and if they can be watered after moving.

WORLD LINSEED PRODUCTION

The English Journal, World Crops for March 1951 contains an extensive discussion on Linseed by E. S. Bunting. The article reviews production in Argentina, Russia, India, Europe, Africa, and North America.

Argentine production is still below its pre-war level amounting to 640,000 tons in 1949 as compared to 1,489,000 tons annually for the pre-war period 1935-'39. The USSR production in 1948 is listed at 482,000 tons compared to 803,000 tons in the 1935-'39 period. European production outside of Russia in Europe in 1949 was nearly twice the pre-war average. African production is largely in Morocco amounting to 50,000 tons in 1949.

As a result of the war, oil-seed crushing industries expanded in India, Uruguay, and especially in Argentina. Argentina now has 20 factories which annually produce 120,000 tons of burlap from flax straw. When and if a suitable water supply can be obtained this reviewer suggests that North Dakota might well investigate the manufacture of burlap bags from our own North Dakota flax straw. About 300,000 tons of linseed straw are annually used in the United States in the manufacture of cigarette paper.

Variety trials conducted at Cambridge, England include many varieties developed in the United States and Canada. (H.L.W.)