BETTER SCOTCH PINE CHRISTMAS TREES BY SEED SOURCE TESTING IN THE NURSERY

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Since 1945 the writer has tested over 200 known lots of Scotch pine seed including sources from Austria, Belgium, France, England, Germany, Greece, Italy, Norway, Poland, Scotland, Spain, Sweden, Switzerland Turkey and Yugoslavia. These have been studied for growth habits, needle and branch characteristics as well as winter color in 1- and 2-year-old seedlings and 3- and 4-year transplants.

These tests have shown rate of growth, needle length, winter coloration and to a lesser extent tree form of the various sources and what to expect later on in life as the trees become Christmas tree size. After several years of comparative testing, superior sources for Christmas tree production can be selected especially as to best winter green color, rate of growth and approximate needle length With the seedling testing technique used in these studies future yellowing of Scotch pine trees can be predicted at the end of the first year. For details refer to the article by the writer in February 1964 American Christmas Tree Growers Journal, Reprints of this article are available upon request.

Within the last 5 years, many foreign sources have been discarded for future comparative testing because of their tendency to extreme winter yellowing or because of their too rapid growth rate or their tea long needle length. This discarded group of sources includes most of the tested sources from Belgium, Northern Germany, Poland, Norway, Sweden, Italy, Switzerland, and Yugoslavia. The more recent studies have been concerned with specific sources from England, France, Greece, Southern Germany, Spain and Turkey. Sources from these countries generally have fair to excellent green needle winter coloration, medium to short needle length and medium to slow height grcwth.

However, sources from a single country have been found to vary widely especially as to growth rate and needle length but to a lesser extent to needle coloration Thus it is important to have authentic seed sources properly labeled as to exact origin and tests must be conducted more than one year because of the effect of varying atmospheric conditions of moisture, light and temperature.

Sources have been tested from five different provinces in Spain at two or more elevations namely Burgos, Cuenca, Guadalajara, Guadarrama, and Soria. All sources performed fairly uniformly with slight variations in rate of growth and winter coloration Many sources from France were tested several years with considerable variation in rate of growth. The slowest growing source ever tested was labeled Pyrenees Orientale and the fastest growing French source tested was from St Nizier, St Die, and La Matte de Angles areas Most of the sources from the large Central Highland area including Haute Loire and Auvergne group performed similarly and quite consistently.

The two sources which have performed most excellently and most encouragingly in the last few years tests when they have been available, are those from Greece and Turkey. These sources from Greece and Turkey appear to have the best combination of ideal Christmas tree characteristics than any other country. Present tests in 1964 and 1965 will either verify or nullify these findings as several duplicated tests are in progress. Growers who have planted small quantities of these sources in the field in past years, when available, have given good reports of their performance to date Details of tests of these two countries sources will be published in the future

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Turkish sources in particular have the best green winter color consistently of any sources tested at Geneva, N. Y. Both have medium length needles and the Greece lots appear to have excellent form and branch angle.

All sources from England and Scotland have shown excellent blue-green color, mostly with medium length needle and medium growth rate. Secondary height growth and a new set of terminal buds on these sources will form in certain years and under certain weather and soil conditions which may be non-beneficial.

Several seed sources from the U. S. or special selected growers strains have also been tested during these studies either by solicitation of the writer or by request of the grower. These sources are listed below by the designation used by the sender together with the state when known.

Abell's Blue Green, N. Y.	Mehlenbacher, N. Y.
Boonville, N, Y. (Authentic)	Musser's Reefer Strain, Pa.
Colbry's, Boonville	Nelson-King Special, Pa.
Downey's-Canadian, N. Y.	New Breman, N. Y.
Eddie Foster, N. Y.	Nyebranch, Pa.
Herbst-Non-Yellowing	Painted Creek, Single Tree, Pa,
Herbst-Adirondack Mts., N. Y.	Painted Creek, Mixture Selection, Pa.
Herbst-Canadian	Rhoades, Delta Co., Mich.

The results of these tests and the general appraisal of these stocks comparatively is not complete on all of them at the present time and will not be reported here. Some of them which did not perform well as to winter coloration are not available at the present time. Several of these sources showed excellent characteristics and winter coloration. There was considerable variation to growth rate and needle length. A summary of the performance of most of these sources may be published in the future. Anyone interested in the writers appraisal of the comparative performance of any individual sources may request this information.

Here are a few important suggestions to remember if growers wish to improve the Scotch pine Christmas tree of the future for themselves:

1. Plant several authentic seed sources under your local climate and environmental conditions. Choose a few tested sources to your general liking which have proven worthy of trial by good nursery performance: Then after a few years in these field tests, you can select your own ideal source for future planting.

2. Grow your own seed from selected trees in a plantation forming seed orchards or plant your own orchards from seedlings of some of the excellent tested foreign sources. For those interested in more details in seed orchards refer to the article written by E. J. Eliason, entitled "Grow Your Own Seed", published in the July, 1964, issue of the New York Christmas Tree Growers Journal Volume 2, No. 2.

3. Be careful about collecting seed for sale or for your own planting. Examine plantations in early winter for color of mother trees. Trees which are green even in October may show extreme yellowing in December, Older Scotch pine trees 15 to 30 years of age or old plantation trees do not normally show this extreme yellowing tendency as do young trees 3 to 10 years old. Therefore, one may be fooled by collecting from old green plantation trees even in the winter. One alternative is to check the color of young naturally reproduced trees adjacent to old plantations. The other and more reliable method would be to collect a few seeds, grow a few 1 year seedings and check them against "known green strains" planted side by side. This would delay your program one year, but it might be worth the effort to have a 100% accurate determination. The writer has found that seed collectors in the past have made the serious mistakes listed above.