

The Propagation Of Junipers From Cuttings

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One of the most convenient ways to propagate Junipers in large variety is by means of cuttings. This has been done for a great number of years in Europe as well in the United States. The purpose of growing Junipers from cuttings is quite obvious: to multiply a chosen plant and retain all its characteristics. It ranks among one of the most effective methods of increase for a large selection of Junipers. Some species and varieties are easily propagated by cuttings, while others require a little more attention, and some are difficult, but the method prevails because of its economy in handling. Besides, there is the advantage which is obtained by having the plant on its own roots.

It is not necessary to have a greenhouse for rooting Juniper cuttings; it can be done in a coldframe as well. In France the nurseryman uses bell jars, which is more or less an ancient way of propagation in our eyes and commercially unpractical.

In Germany coldframes are used. About 6 inches of horse manure is placed in the bottom of the frame. When watered down, this horse manure is a heat producing medium. On top of this 4 to 6 inches of soil, while the top layer consists of 4 inches of sand. In this sand the cuttings are inserted. The cuttings are taken in August, with a heel, and remain in the frame the following year and taken out in the spring of the second year. This whole process thus takes almost 2 years.

In Holland propagation of Junipers by cuttings is done in the same manner, with exception of the use of horse manure. Here sometimes straw is the material which is used for the heating medium, or an electric cable. The final result can be very good, although it usually will be less, than with the use of a greenhouse.

Since greenhouses in Holland and Germany are generally employed for grafting purposes the year around, it is considered too expensive to use them for evergreen cuttings. Here in the United States we commonly have greenhouses available for the propagation of Junipers.

Medium:

The medium commonly used is sand. The texture of this sand should be rather coarse. Coarse sand promotes the aeration better than fine sand does, so the first should be preferred. There is not a rule without an exception however, there have been successful batches of cuttings grown in fine lake sand. It is questionable whether sand is the best medium at all. Mixtures of peatmoss and sand promote a good root system also. I shall refer to this a little later.

To prevent fungus growth, it is advisable to renew the sand each year.

Size of the cuttings:

Cuttings should be made approximately 6 to 7 inches tall. In the South cuttings are taken much taller than this, but it is harder to grow a shapely plant from these cuttings. In order to grow a plant, which branches from the base, cuttings 6 to 7 inches tall are of the most desirable size.

The Europeans and some nurserymen in the United States prefer heel cuttings. These are cuttings stripped off the plant, so that a small slice of the older branch is attached at its base. It might have some advantage to make heel cuttings when they are grown in a frame, but for growing in a greenhouse with bottom heat, cuttings without a heel do just as well. There is also some controversy among nurserymen, as to which tool to use in preparing the cuttings; knife or clippers. In my estimation, both work just as well. More is accomplished in the course of a day however, when clippers are used.

Time:

Proper timing is very important in taking cuttings. It is difficult to give an exact date when the material is in the right condition, so the best results can be expected. This depends a great deal on the weather. During a period of heat and drouth, after a period of rain, plants will quit growing and will be ripened off soon. On the other hand, when the rain comes more evenly over the whole season and the temperature is more constant, plants will keep on growing, and ripen off later. It is self evident that this has a great influence on cutting material. As a general rule, the proper time to take Juniper cuttings coincides with the time plants stop growing, at the time plants start to grow, and never in the middle of the growing period. When Juniper cuttings are grown in a frame the time to take them is about the latter part of August or the beginning of September. This is the time when the growth is about completed. Some growers like to prepare Juniper cuttings in early summer. It can be done and the results can be satisfactory, but the time of late August or the beginning of September is considered better.

Propagation in the greenhouse, which is the usual procedure in the United States starts in November for Junipers. The cuttings are prepared in the workroom and care should be taken that they do not dry out. They are inserted in the bench, at about $\frac{3}{4}$ " by 2". This will amount to about 100 per square foot. The sand should be watered thoroughly before the cuttings are placed and then firmly packed.

Watering:

In the fall and winter, when the sky is cloudy many times, it is advisable to be very careful with watering. The sand never should be dry, but on the other hand, when too much water is applied and the sand is saturated, the conditions are ideal for fungus growth. This should be prevented, for fungi can do a great deal of harm to a bench of cuttings. It can destroy thousands of cuttings overnight. As soon as fungus is spotted, it is best to open the ventilators to let fresh air in and watering

should be omitted. Avoid watering in the afternoon. The first 8 to 10 weeks are the most critical, and at this time utmost care should be taken as far as watering is concerned.

When the cuttings commence to make new growth, it indicates that roots are forming. This will be about the case in February or March. At this time of the year the sun's rays are warmer and will increase the temperature in the greenhouse. More water can be applied, for the sand will dry out faster and the roots will take up more moisture. It could be necessary also that at this time some whitewash should be applied to the outside of the greenhouse to prevent the sun from burning the cuttings. At first a light application will be sufficient, while later a heavier coat of whitewash should be put on. By the 15th of May the cuttings will be ready to be planted in a field with irrigation. When potting is preferred, this can be done earlier and the pots plunged in a frame with shade frames overhead.

Use of hormones:

It is advisable to use a rooting stimulant for Juniper cuttings. Hormodin No. 2, in powder form, which contains 0.3% indolebuteric acid will generally be sufficient, but for the varieties which do not root readily, Hormodin No. 3 which contains 0.8% indolebuteric acid will be better.

Which species and forms of Junipers are generally rooted:

Of all the Junipers, the species *Communis* consists of most of the forms which can be propagated by means of cuttings. To name a few: *Juniperus communis depressa* and the forms aurea and Vase Shaped, *Juniperus communis montana*, *Juniperus communis hibernica* and the form fastigiata, and *Juniperus communis suecica* and *J. c. suecica nana*. Another species which roots very well is *Juniperus conferta*. *Juniperus horizontalis* and the variety *plumosa* (Andorra Juniper) strike very good from cuttings. Also *Juniperus Sabina* and the variety *tamariscifolia* do well. The latter is not grown very much any more, because it is susceptible to blight. In the species *chinensis* are many varieties which can be propagated by cuttings, but there are more which have to be grafted. One of the easiest is *Juniperus chinensis glauca* Hetz, a plant originated at the Fairview Evergreen Nurseries. A result of 90-95% rooted cuttings is common. It is different with *Juniperus chinensis Pfitzeriana* and its forms aurea and glauca however. These Junipers can really be troublesome. The best way to handle them thus far, is to make the cuttings early, that is in September. Then take them up in January and re-stick them. This shock seems to encourage root formation. It is also advisable to use Hormodin No. 3 on these cuttings. *Juniperus chinensis Sargentii* is another one hard to handle. *Juniperus chinensis Keteleeri* is usually grafted, but I believe that this form can be propagated from cuttings. Last year I had a result of 64%. *Juniperus virginiana glauca* gave me 53%. These results are not very striking, but I am very sure that with some experimenting this can be increased. Maybe spring cuttings under a fog line

is the answer. Most of the virginiana forms are propagated by means of grafting.

Juniperus squamata Meyeri is a very attractive plant, which does not give much difficulty in propagation by cuttings. Hormodin No. 2 will generally be sufficient to make them root.

Since many nurserymen complain that grafted junipers are short-lived, and the general trend is toward plants on their own roots, it should be our aim to propagate junipers from cuttings as much as possible. There are still a number of junipers which cannot be rooted or are hard to root from cuttings. But in the future, with the aid of the several hormones and modern equipment, it may be possible to propagate all of the junipers on their own roots. As I mentioned before, spring cuttings and the fog line or a different rooting medium might do it. It is very interesting to read what the research workers are doing in Boskoop, Holland. They are trying out various media (peat moss and sand in several mixtures) and liquid hormones. Here are some of the results they have obtained:

Cuttings of *Juniperus chinensis Pfitzeriana* were inserted in a mixture with double sash in October. A mixture of peat moss and sand (two to one) was used and the cuttings were treated with alpha naphthaleneacetic acid (50 mg. per liter of water). In March of the following year, 85 percent were rooted.

Cuttings of *Juniperus chinensis Pfitzeriana* were inserted in a mixture of peat moss and sand (three to one) in a greenhouse on November 1. On January 17, 93 percent of the cuttings were rooted. The cuttings were wounded at the base.

Cuttings of *Juniperus squamata Meyeri* were wounded and soaked for 24 hours in 50 mg. indolebutyric acid per liter of water before inserting in a medium consisting of peat moss and sand (two to one). Within less than three months, 100 percent of the cuttings were rooted. Use of a double strength indolebutyric acid solution gave the same result.

Good results can be obtained with junipers which are generally regarded as difficult to root. Wounding at the base seems to be an important procedure.

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CHAIRMAN SNYDER: Pieter Zorg did an excellent job and I am certain that all of us are very pleased with his presentation. There are about eight minutes for questions and discussion.

MR. ROSCOE A. FILLMORE (Fillmore's Valley Nursery, Nova Scotia): I have tried a number of times to root Pfitzer's juniper cuttings in sandy soil without success. I would like to hear of some of the experiences of others along this line.

MR. ZORG: I have never rooted junipers in sandy soil. I have tried junipers in sand and in sand and peat moss of various mixtures. I have also tried it in vermiculite which was not satisfactory. With Pfitzer's juniper in sand, I occasionally put them in early, in September, take them up in January, and restick them. Last year I had wonderful results with it.

MR. ROSCOE FILLMORE: Do you retreat the cuttings in January?

MR. ZORG: No, I don't retreat. I take them out and set them in right away. I don't put any powder on them any more at all.

MR. ROLLER (Verhalen Nursery Co., Scottsville, Texas): All of our propagation, as I have said before, is in sandy soil. We don't use sand and peat mixtures or vermiculite. Our cuttings are being stuck at the present time. (Editor's note: early December.)

In Texas, we can stick Pfitzer juniper cuttings any time from the middle of November to the middle of February, just before the plants start to grow, and expect the same results or, possibly, a little better results from the February group. Year in and year out, we consistently get averages of around eighty percent rooting by just sticking these cuttings in our sandy soil and covering with lath.

Of course, peat moss has been worked into the soil. As I said yesterday, these beds have one medium size bale of peat moss spaded into approximately 160 square feet of bed space and then an additional bale of peat moss is added after each crop is removed. We never retreat the cuttings and so far we have not used wounding.

MR. JONES (Passaic, N. J.): Have you had any experience rooting the forms of *J. virginiana*? Do they make a good root system?

MR. ZORG: It is well known, of course, that Pfitzer's juniper is better when propagated by cuttings than by grafts. You probably will agree with that because the plant will grow much better when propagated from a cutting.

MR. JONES: What is the difference between *Pfitzeriana* and *glauca*? If you have any experience, I would like to know if they will survive and keep on growing well?

MR. ZORG: They will survive and keep on growing but I haven't had too much experience yet with *glauca* cuttings. I have made cuttings for the past three years only, and I don't know what the procedure will be after they are four, five, or six years old.

MR. HERBERT TRAUTMAN (Trautman Nurseries, Franksville, Wis.): We grew *J. virginiana* from cuttings in a limited amount about fifteen years ago. I believe we still have some of those original plants in the nursery—Dundeas, *glauca*s, and all kinds of *chinensis*. They are growing well. They were grown in beds under a high lath shade. Although our percentages were low, we got enough to make it pay for our own use. We never tried to put them on a commercial basis. We can get *Keteleeri* very well, but we discontinued that plant because it is one of the plants that burns very easily up North.

MR. JACK HILL (D. Hill Nursery, Dundee, Ill.): We have tried *J. virginiana glauca* for a number of years and never got substantial results. I know for a fact that the Monrovia Nursery in California grows *glauca* because I have seen them there to a height of four feet. They seemed in good shape.

CHAIRMAN SNYDER: I think that it would be wise to defer additional questions until the discussion after the next paper. Thank you very much, Pieter, for a very excellent discussion on junipers from cuttings.

The record of D. Hill Nursery Company in the production of narrow-leaved evergreens is, alone, sufficient to recommend someone from that organization to discuss the grafting of junipers. We are glad to welcome Mr. Jack Hill to our meeting and are anxious to hear his discussion of grafting junipers.

MR. JACK HILL: Mr. President, Mr. Chairman, and assembled propagators: In the paper which I have prepared, I have not attempted to go into the history of grafting at all. There are repeated references in the literature to grafting that was done many hundreds of years ago. I believe there are actual references of it in ancient China where it was practiced on fruit trees. It was a recognized science at that time.

I have also concerted the efforts of this paper on the methods which are employed most generally throughout the United States, for example, I have not gone into trick bottle grafting nor the out-door grafting practice.

Mr. J. B. Hill presented his paper, entitled "Juniper Grafting—Practical and Technical Aspects." (Applause)

Juniper Grafting—Practical and Technical Aspects

J. B. HILL

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The intent of this paper shall be, not to restate those basic fundamentals found in available literature, but to relate experiences from the standpoint of a commercial propagation effort. Special emphasis will be afforded those deviations from the standard procedures outlined in the literature. These deviations we have proven practical, and useful.

It should not be necessary to define a graft, let alone a juniper graft, but for the purposes of this paper, it shall be considered as "An organic union of two plants, as when a bud, or shoot containing a bud, is mechanically combined with another plant in such a manner that it lives and develops upon the food and nutrients supplied by the other."

The reasons for producing junipers by the grafting method are to enable the reproduction of those species and varieties that do not "come true" from seed, nor root readily as cuttings, and to insure vigorous shoot growth and plant development with those varieties proven to root so poorly as cuttings that this process is impractical from a commercial growers view.

The simple elements of a juniper graft are: the understock, the scion, the equipment, and the technique. These will be further enlarged upon in this order.