

# Leyland Cypress

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It's no overstatement to say that the most exciting thing to happen in the southern Christmas Tree industry in years is the introduction of Leyland cypress. Beleaguered growers, tired of fighting insects, disease, poor form and the generally poor financial returns associated with Virginia pine, are welcoming Leyland cypress with open arms. Still, many growers haven't tried Leylands, and even among those who have, unanswered questions remain.

In this article, we'll review what's known about Leyland cypress and the cultural practices necessary to make it into a Christmas Tree. This won't be an exhaustive discussion nor will everything in it be right for each and every circumstance. The goal will be to pass along pertinent information from published literature plus what we've learned about Leylands after seven years of growing them at Christmas Forest. I'm sure some of you will have had contrary experiences to ours, and I'm equally sure I don't have the last word on Leyland cypress. So, be forewarned, don't necessarily swallow whole everything you read herein. And, should readers have corrections or additions, please let me hear from you. We all still have a lot to learn about Leyland cypress.

## **What is Leyland cypress, and where did it come from?**

In the 1800's numerous tree species from all over the world were planted in an arboretum on the Leighton Hall estate in England. In 1888 several unusual seedlings were noticed at Leighton Hall, apparently from a rare intergeneric cross between an Alaska-Cedar mother tree and a nearby Monterey

Cypress. Both parent trees are native to the North-American Pacific coast. The new hybrid was called a cypress since the Alaska-Cedar is a "false cypress" and the Monterey Cypress is a "true cypress". Neither are related to our southern cypress (baldcypress).

There are at least seven, and probably more, clones or "cultivars" (cultivated varieties) of Leyland cypress in existence, each from a different cross between the parent species. The cultivar planted almost exclusively for Christmas Trees in the southern United States to date is 'Leighton Green'; however, other cultivars such as 'Castlewellan' and 'Silver Dust' show promise for those customers preferring something different.

Leyland cypress has been planted in South since about 1965, but it was only considered for use as a Christmas Tree after Clemson University began studying it about 15 years ago. The production of Leylands for Christmas Trees has since spread from South Carolina to other parts of the South.

## **Leyland cypress Compared to Virginia pine**

Why all the fuss about Leyland cypress, and how does it compare to Virginia pine as a Christmas Tree? The short answer is that Leyland grows faster, requires less maintenance and produces a far greater proportion of quality, salable trees than does Virginia pine. More detailed answers will be discussed below.

## **Survival**

Under good conditions Virginia pine survival usually falls in the 80% - 90% range, with 85% being

<sup>1</sup>Bennett, B. 1995, Leyland cypress. Georgia Christmas Tree Assoc., Inc. Tree Talk, Vol. 9, No. 1. 19-25.

a good effort. Leyland cypress survival varies widely depending on field conditions and the quality and handling of planting stock. However, if healthy plants are properly planted in a well-prepared field, it's not uncommon to obtain survival rates in excess of 95%.

At Christmas Forest we expect and normally get 100% survival using one-gallon planting stock and have obtained over 95% survival with smaller pot sizes down to a quart. Using pots smaller than one quart we have experienced significantly lower survival. One grower recently reported he planted 500 Leylands in small "plugs" this past spring and now (April) has only 3 surviving. This poor performance may be due to other, unexplained factors, but small pot size is likely a big part of the problem.

### **Quality and Salability**

An excellent field of Virginia pine might yield 70% salable trees; our experience at Christmas Forest has averaged about 50% salable trees with one field approaching 70%. With Leylands, however, we have consistently realized over 98% salable trees. One field of 1000 Leylands planted in 1993 (from one-gallon pots) will, in all likelihood, yield 100% salable trees at age three.

Virginia pine quality is always a problem. It's an unusual field of Virginia pines which will grade more than 20% premiums if grading rules are strictly applied. On the other hand Leyland cypress commonly produces in excess of 70% premiums. For example, the field of 1000 Leylands mentioned above will probably produce in excess of 80% premium trees by its third Christmas.

### **Insect and Disease Control**

All of us who have grown Virginia pine know it seems to be attacked by practically every possible insect and disease. We have to spray all through the eight month growing season for first one bug and then another. We even have to spray once or twice again before sale season to keep the aphids down.

In contrast, one of the most significant advantages offered by Leyland cypress is its resistance to almost

all insects and diseases (a likely result of the phenomenon of "hybrid vigor"). The only significant insect problem seems to be rare infestations of bagworm, and the only major disease is cypress canker.

In seven years of growing Leylands we have had no insect damage of any kind with virtually no insect or disease control. We have had three or four smaller trees die from what may have been cypress canker, but this has not become a significant problem. Cypress canker is caused by a fungus which infects the tree through wounds in the bark. It produces bleeding of sap and may kill limbs and even the entire tree.

### **Chemical Requirements**

Directly related to insect and disease susceptibility is the level of chemicals required. In Virginia pine Christmas Tree production, chemical requirements are very high. We need chemicals not only for insect and disease control, but for weed control and coloring as well.

We've already seen that Leyland cypress promises drastically reduced insect and disease control costs. In addition, many growers have found that with proper soil fertility, the Leyland's natural dark-green color is so good they don't need coloring prior to sale. Other growers have found that colorant is still required.

Of lesser note it has been observed that under older Leylands (two years plus) there is slower regrowth of weeds. The reason for this is not known, but it appears to be the result of some type of natural pre-emergent herbicide produced by the Leyland cypress itself.

### **Interplanting**

Interplanting Virginia pine in skips from previous years' planting has not been effective. Younger pines just never seem to do well when surrounded by older, larger ones. But Leyland cypress does well when interplanted, especially when interplanted in last year's Virginia pine. The Leylands grow fast enough that, by the time the field goes to market, they are as large or larger than the pines. With

proper interplanting it's possible to keep practically 100% of a field producing either pine or Leyland cypress through an entire rotation.

### **Wet Site Tolerance**

Neither Virginia pine nor Leyland cypress likes "wet feet"; both prefer well drained sites. However, it's been our experience that Leyland cypress does much better on poorly drained areas than Virginia pine. In our wettest field we have a nearly fully stocked stand of three year old Leyland cypress (average height seven feet) thriving adjacent to an area where Virginia pine planted at the same time has almost completely died out due to excess moisture.

### **Stem Straightness**

Virginia pine is notorious for crooked stems and difficulty in maintaining a good, single central leader. However, except for its tendency to form multiple leaders (correctable with proper shearing), Leyland cypress keeps a good central leader and naturally grows quite straight. This doesn't mean you won't have to stake some in their first or second growing seasons; high winds and wet soil conditions cause leaning problems with young Leylands which often have too much top for their immature root systems to support.

### **Qualities for a Living Tree**

Unfortunately many people are getting the idea that cutting a tree harms the environment. While many have mistakenly turned to artificial trees, others like to buy a living tree either B & B or in a large pot so they can enjoy it as a Christmas Tree and plant it in their yard afterwards.

While Virginia pine is not a desirable landscape tree, Leyland cypress excels in this regard and naturally keeps its "Christmas Tree shape" with little or no care. Demand for Leylands in 5 and 10 gallon pots (and larger) is increasing every year and such sales can become a profitable addition to the Christmas season. But, be advised, you'll probably need a nursery certificate to sell trees with their roots still attached.

### **Qualities for a Flocked Tree**

We always thought Leylands would not do well as a

flocked tree because of their rather limber branches. About two years ago one of our customers asked to have her Leyland flocked. I told her we'd never flocked a Leyland cypress before and gave her reasons why it probably wouldn't be satisfactory. Well, she insisted, and with a light flocking, her tree turned out to be one of the prettiest we'd ever done. Before we were finished with it, another lady walked in and decided she wanted hers done the same way!

We've now found that, if not flocked too heavily, Leyland makes the best flocked tree on any we grow.

### **Ease of Baling**

With their stiff, horizontal branches, pines can be tough to bale, especially when they get big. On the other hand Leyland cypress has branches that grow in a more upward direction, and the tree just seems to collapse when it's placed on its side. This not only makes baling easier, but, even when unbaled, Leylands won't blow out of the bed of a pickup truck as full Virginia pine can.

### **Desirable Odor**

This is one category in which the Virginia pine comes out on top. Leyland cypress has only a faint odor at best. Surprisingly, this hasn't proved to be a sales problem. When we explain the lack of odor to potential customers, their usual reply is "The tree is so beautiful I don't care. I can buy something in the Gift Shop to hang on it if I need more odor". One grower suggested hanging as an ornament on the tree one of the small Christmas Tree shaped air fresheners available at many stores.

### **Allergy Problems**

An unexpected side benefit to the Leyland's lack of strong odor is that it doesn't seem to bother most people with allergies.

One of the secretaries in our office had a young daughter with serious allergy problems. About three years ago they put a Leyland in their house and found it was the first time they had been able to use a real tree since their daughter was born. Needless to say both parents and child were pleased.

## Shaking Requirements

One of the nicest qualities of Leyland cypress is its ability to keep practically all of its inner needles through an entire Christmas Tree rotation. This produces a much denser tree and relieves us on the need to shake it at time of purchase.

Shaking Virginia pines is the most time consuming part of our sale process, costing us about \$1.00 per tree (it's free to the customer). Not only does the Leyland save money on shaking but it can cut checkout time in half.

## Planting Cost

This is another area where Virginia pine beats Leyland cypress. Not only is Leyland planting stock **much** more expensive (because it must be rooted rather than germinated from seed), but the larger, potted plants require more planting time.

Leyland cypress planting stock costs between \$900 and \$2000 + per acre, depending on container size, and planting costs will be about double that of a bare rooted seedling.

## Shearing

Because of its natural "Christmas Tree shape" and good density, Leyland cypress can require less shearing than Virginia pine. However, we shear our Leyland cypress every time we shear our Virginia pines. Frequent shearing produces a denser, prettier tree. We've found that Leylands are much easier to shear than pines (mainly because you don't need to take off as much foliage) and much easier to shear correctly (because of the natural conical shape).

The only real shearing problem presented by Leylands is the tree's tendency to form multiple leaders; these must be cut out by hand about two or three times a year.

## Customer Preference

Our experience with customer tree preference seems to have been similar to that of Leyland growers across the South - most customers prefer Leyland cypress over Virginia whenever given a choice! This past year we had 1500 Leyland

cypress tagged for sale with sizes ranging from 4' through 11'. After the first weekend of sales (Thanksgiving weekend), we didn't have a Leyland left on the farm over 6' tall. Most of the trees cut that first weekend were Leyland cypress.

When we ask a customer who purchased a Leyland previously how they liked it, the response is almost always the same: "It was the best tree I ever had. I never want to get anything else. I kept it up well into January (or sometimes February), and it looked as good the day I took it down as the day I put it up! In fact, it looked so good, I hated to throw it away so I kept it in the backyard for several weeks, and it still didn't dry out! And, there weren't needles in my carpet after I took the tree down." Need I say more!

But, we do have one or two Leylands returned each year because they dried out. In every case so far except one we've been able to determine that the tree ran out of water for one reason or another.

Some customers express concern that the apparent lack of branch stiffness will cause decorating problems. And it is true that folks who have a lot of large, heavy ornaments might prefer another species. But, no customer of ours who has actually tried a Leyland has told us they would get a different tree next time. Most choose to change their decorating habits rather than change trees!

## Houselife

The biggest factor in the consumer's positive view of Leyland cypress is its outstanding houselife. Without a doubt a Leyland kept in water will outlast any other tree on the market - hands down. We put one in our Gift Shop the weekend before Thanksgiving, kept water in the stand, and it was the middle of March before it dried out. Several customers have told us they kept their Leyland up as a Mardi Gras tree. Another tree purchased by a country club was redecorated after Christmas and used as a Valentine's Day tree.

But - and this is an important "but" - **the customer has to understand that the tree must be kept in water**. It will drink far more water than any other

tree. That's why it lasts so long. We tell our customers to check the tree's water twice a day, at least initially.

### Need for Irrigation

Irrigation is certainly not mandatory for growing Virginia pine, but in South Carolina prolonged droughts have killed even large Leyland cypress. So, it's possible irrigation may prove to be not only desirable but necessary in certain circumstances. Our experience does show that Leylands respond well to supplement water during hot, dry periods.

### Susceptibility to Cold

Without doubt Virginia pine will stand more cold weather than Leyland cypress. Large Leylands in South Carolina were damaged and two year olds were killed when the temperature dipped to -8°F. This suggests that cold weather may limit the range of Leyland cypress more than any other factor. We have experienced temperatures down to single digits, around 8°F, with no noticeable damage to our Leylands.

### Usefulness as a Wholesale Tree

The Virginia pine is at best a marginal tree to sell wholesale and then display on retail lots. It just doesn't hold up well enough without a great deal of care. No one knows for sure, but the Leyland cypress will probably be even less successful as a wholesale tree because of its water requirements. It just doesn't ever go dormant or harden off in our climate, and so it needs water after it's cut. It is, in all likelihood, only a choose & cut tree.

But, for us choose & cut growers, this is good, because no one will be able to sell them on lots in town to compete with us. If people want the qualities the Leyland offers, they'll simply have to come out to a choose & cut farm.

### Profit Potential

Well, what's the bottom line of all this? The following chart comparing costs and returns for growing Virginia pine and Leyland cypress for Christmas Trees is based on seven years of growing and four years of selling Leyland cypress along side of Virginia pine at Christmas Forest:

### Profit Potential (per acre)

	Virginia <u>Pine</u>	Leyland <u>Cypress</u>
Trees Sold	500	980
Rotation (years)	5	4
Price/tree	\$20	\$35
Gross Income	\$10,000	\$34,300
Management Costs	\$ 6,000	\$ 6,000
Sales Costs	\$ 1,500	\$ 2,000
Net	\$ 2,500	\$26,300
Net Income/year*	\$ 417	\$ 5,260

\* Net Income/year=Net income divided by rotation plus one year out

The chart speaks for itself. Actual results indicate it's possible to make over 10 times the net profit by switching to Leyland cypress. **This will not apply to every grower's farm and situation. Your own personal experience is the true "bottom line".**

### Cultural Practices for Leyland cypress Christmas Trees

#### Site

The literature indicates that Leyland cypress will grow on a wide range of soil types from sand to clay and a pH range of perhaps 5.0 to 8.0. This is probably true, but our experience is that the Leyland reacts dramatically to the conditions under which it is grown. For example, it reacts much more noticeable to soil fertility and drought than does Virginia pine. Also, it seems to do best when some clay is present in the soil. So, I think only actual experience will tell us how Leylands will grow in different soil and water conditions. I can say that it does very well on our soils at Christmas Forest which are moderately well-drained to somewhat poorly-drained silty, clay loams with a pH of 5.6 to 6.2.

#### **Planting stock**

Leyland cypress must be vegetatively propagated since it is, as far as anyone knows, a sterile hybrid. The rooted plants are transplanted from pots into the field. Personal trials using bare-rooted plants have to date proved undesirable. So, this leaves us with the decision of what size and quality of potted

plant to choose.

Leylands for Christmas Trees have been sold in pot sizes varying from small “plugs” (about one inch in diameter and a few inches deep) up to five gallon pots and larger. At Christmas Forest we’ve planted a range of sizes over the years:

- plugs - 1" X 4"
- liners - 2.5" X 2.5"
- liners - 3.5" X 3.5"
- nurseryman’s gallons - 6.5" X 6.5
- full gallons
- two gallons
- five gallons

Generally speaking, the larger the pot and plant size, the sooner it’ll become a Christmas Tree and the higher survival will be. However, as one might expect, there is a point of diminishing returns to be found somewhere between the smallest and the largest.

Some examples illustrates this:

Field 1. The first year we planted Leyland cypress, the only size we could find was the small plugs. We lost about 10% to mortality. At age four the field averaged six feet tall.

Field 2. Two years ago we planted a field using nurseryman’s gallons. Survival was 100% and at age two the field averaged six feet tall, the same height in two years as field 1 produced in four years.

Field 3. At the same time we planted field 2, we planted the field immediately adjacent to it using liners (3.5" X 3.5" pots). Growing side by side with field 2, we got over 99% survival with the liners, but the average height at age two was one foot shorter than field 2.

Field 4. A fourth field planted using two gallon plants did not show growth advantages over field 2.

Certainly, one can save money initially by using liners. But is this the most cost effective choice?

Our experience has shown that the nurseryman’s gallon will produce, in an average field on our farm, a seven foot average tree at age three while a liner only produces a six foot average tree at the same age. We can sell the seven foot tree for about \$32 and the six foot tree for \$25. Now, if the liner costs \$1.00 and the gallon \$1.75, this means that if we invest 75¢ more at planting time, we can realize \$7.00 more three years later - a before tax return on investment in excess of 100% per annum! Who among us couldn’t stand a whole lot of that?! In addition, large plants can withstand adverse conditions such as poor soil, drought and misuse of herbicides much better than smaller plants can.

Based on these results, plus the fact that the nurseryman’s gallon can easily be planted using a posthole digger, we have, at least for now, decided that the nurseryman’s gallon is the best pot size for us. Planting a smaller plant size results in significantly lower returns, and planting a larger one doesn’t noticeably improve returns. The nurseryman’s gallon seems to be the “point of diminishing returns”.

In fairness, the gallon has at least one major disadvantage compared to smaller pots - it’s much harder to transport or ship.

### **Soil Fertility**

No one really knows what soil fertility levels are best for Leyland cypress. We do know that fertility is more important to a Leyland than to a pine. On some farms Leylands are vigorous and green while on other farms Leylands of the same age are yellow and stunted; the difference has to be largely the result of soil fertility and/or pH.

What we’ve done so far (with good results) is to send a soil test prior to planting to A&L Labs of Memphis, Tennessee and ask for fertility recommendations for Virginia pine. I have doubts that anyone even knows what Virginia pine needs, but, certainly they know more about it than they do about Leyland cypress (the folks at A&L will readily admit this). We then bring our site up to the fertility recommendations from A&L but with no nitrogen added. We add a little nitrogen in May of

the first growing season and 13-13-13 in subsequent growing seasons. But, we're careful not to add any fertility in the last several months of the harvest year so as to avoid problems due to lack of winter hardening.

Bill Murray (Georgia), whose farm has sandy soil, gets a drooping effect after fertilizing Leylands, an indication of over-fertilization. This just emphasizes how little we know and about fertilizing Leyland cypress. Soil fertility is an area where research is badly needed in Leyland cypress Christmas Tree production.

### **Planting**

There is a running debate over whether or not to shake the soil medium off a Leyland's roots before planting. It's easy to find growers who will "vigorously" support one way or another. We prefer the middle ground of loosening the outer roots on the sides and bottom of the root ball to prevent a "rootbound" condition. It just stands to reason that the soil around the roots has to help the plant grow and survive initially. But, it's equally true that the roots must be broken out of the ball to avoid being rootbound.

We plant our one gallon Leylands using a manual posthole digger. The "nurseryman's gallon" fits nicely into a posthole. It's important to cover the top of the rootball with about 1/2" of soil to prevent moisture from "wicking" out of the ball. And, of course, make sure the plant is straight and pack around it with your foot to remove air pockets.

We have planted as early as November and as late as April using one gallon plants with no mortality problems. November planting didn't produce a larger plant over an adjacent planting in February. It's probably best to let the plants grow and mature at the nursery over winter and plant in February or early March after the coldest weather is past.

Another advantage to planting the larger, one gallon plants is the opportunity to "set the handle" before the tree is taken to the field. It's much easier to prune an eight inch handle on the tree while it's in

the pot and sitting on a table than after it's planted. Setting the handle on a large (20" + tall) plant does not seem to retard its growth. However, this is not recommended for the smaller liners.

### **Competition Control**

Competition control seems to be every bit as important with Leyland cypress as it is with Virginia pine. In fact, because the Leyland reacts so dramatically to growing conditions, competition control is probably even more important with it.

Concerning herbicides, caution is in order concerning soil active herbicides. We have observed disastrous results from use of Velpar and Arsenal on Leyland cypress, and several growers have reported mortality and stunting from Oust. So, caution is strongly advised.

Because of this we have generally gone to Roundup only around Leyland cypress. Of course, it is sprayed only under the trees, not over the top.

### **Moisture Control**

Although Leyland cypress will stand more moisture than Virginia pine, it still doesn't like wet feet. We notice very pronounced effects due to drainage in our fields. Where drainage is poor we get severely retarded growth, poor color and mortality. On heavy soils with somewhat poor drainage, such as ours, I strongly recommend well-planned field drainage and bedding. Bedding is an expensive headache, but the returns from Leyland cypress justify it. Bedding shouldn't be necessary on better drained soils.

We have drip irrigation and believe it produces better results with Leyland cypress than with Virginia pine. But, we have not experienced a severe drought since we've been growing Leylands. Researchers in South Carolina report trees dying during extremely dry conditions and growth under other circumstances being doubled through irrigation.

Again, we don't have all the answers, but irrigation may very well prove necessary for dependable, long-term Leyland cypress production.

### **Shearing**

We shear our Leyland cypress at the same time and in the same manner as we do our Virginia pine. Some growers say they get by with fewer shearings, but it seems that the more a Leyland is sheared, the prettier and denser it gets.

We set the top by hand just as is done on a pine and then shear the rest of the tree with either a Murphy-Matic or a Saje. If stiffer branches are desired, simply shear closely in the Spring. The resulting branches will be as stiff as those of any other species of Christmas Tree.

One difference between shearing Leyland cypress and Virginia pine is the necessity to remove the Leyland's multiple leaders which will often become multiple stems if left unchecked. Not only are multiple stems unattractive, but if they begin close to the ground, they can cause trees to split when harvested.

### **Harvesting**

Harvesting can be done in the same ways as with Virginia pine. You will notice that occasionally bark opposite the saw cut will peel up the tree when the tree falls. This should not be a cause for concern. We've never seen a tree suffer from this as long as it was kept in water.

We let our choose & cut customers cut the trees themselves unless they need help. However, on the larger Leylands (9'+), they almost always need help. Leylands are much harder to saw than pines, and the larger Leylands are quite heavy. We usually cut the big ones ourselves with a power saw and help the customers drag them out and load.

### **Tree Stands**

Because a Leyland uses so much water, a stand which holds a lot of water is much more important for it than for a pine. We recommend at least a one gallon capacity stand for Leylands less than nine feet tall, and a minimum two gallon stand for larger trees. We try hard to communicate to our customers (through signs in the field, handouts and verbally) the importance of keeping a Leyland in water. If a Leyland cypress is not kept in water, no amount of

colorant is going to cover the disaster. Whereas a dry pine may still keep its color and look OK to the casual observer, a dried out Leyland will crystallize and look simply terrible.

### **Flocking**

Much to our surprise we found Leyland cypress flocks beautifully as long as it not flocked too heavily. A side benefit to flocking is that it greatly reduces the chance the tree will dry out because flocking can practically eliminate transpiration

### **What Does the Future Hold?**

Leyland cypress is not a miracle tree, but it and other alternate species to Virginia pine are going to make southern choose & cut Christmas Tree farming a profitable business for those willing to do things right. I heard one grower say "I'm going to stop planting Virginia pine and just plant Leyland cypress because they grow themselves". This is a mistaken attitude. Sure, Leyland cypress will produce a pretty, conically-shaped tree with little effort. But the tree so produced will not be of sufficient quality to compete with other well maintained Leylands and the top quality trees being shipped in these days from the North.

Southern Christmas Tree farming will still be a difficult, exacting business even with this improved tree. We Christmas Tree growers need to work with Leyland cypress just as hard as we have worked with Virginia pine. The difference will be that we will be working with a tree which can reward our efforts to an extent the Virginia pine never could. This is not the time to get discouraged and get out of the Christmas Tree business. With improved species such as Leyland cypress, and a likely imminent end to the marketing glut, the southern Christmas Tree industry is just starting to become a good business again.