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By

J. C. C. PRICE, *Horticulturist*

"Wherefore, by their fruits ye shall know them."

MISSISSIPPI AGRICULTURAL EXPERIMENT STATION
A. & M. COLLEGE, MISSISSIPPI
J. R. RICKS, *Director*

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A good rule to follow in planting an orchard is, "The best is none too good"; but the fruit grower should have a knowledge of nursery stock in order to know how to select trees that are really best. With as many as ten different grades and prices in the peach to select from, the grower is often at sea when he starts to buy. Some try to get the largest trees, believing that they will produce fruit more quickly than the smaller.

The larger trees are one or two years of age, with a root system a year older than the top. They are dormant budded trees, which means that they are budded and held dormant during the winter and start to growing the following spring. The smaller trees are budded in June and start to growing immediately. The same season they are offered for sale by the nurserymen an "June buds." The top and root are of the same season's growth.

The cost of the different grades of peaches varies from a few cents apiece for the smallest grade of June buds to seventy-five cents or a dollar apiece for the six to seven foot trees. The prices charged for the different grades over a period of five years are as follows:

June Buds	4 to 6 inches	3 to 5 cents	Average of 4 cents
	6 to 12 inches	5 to 7 cents	Average of 6 cents
	12 to 18 inches	6 to 8 cents	Average of 7 cents
	18 to 24 inches	8 to 10 cents	Average of 9 cents
	2 to 3 feet	10 to 24 cents	Average of 12 cents
	3 to 4 feet	12 to 18 cents	Average of 15 cents
One-Year	3 to 4 feet	35 to 45 cents	Average of 40 cents
	4 to 5 feet	40 to 60 cents	Average of 50 cents
	5 to 6 feet	50 to 70 cents	Average of 60 cents
	6 to 7 feet	60 to 80 cents	Average of 70 cents

It is plainly to be seen that the over-size one year old trees cost ten times the price of the twelve to eighteen inch June buds.

We are often led to believe that the cost of a product is an index to its value, and for this reason many people have been induced to buy more costly trees. The nurserymen are forced to charge in proportion to the cost of production. The longer a nurseryman is required to grow a tree in the nursery, the greater the cost; hence, the higher prices on one year old trees. The nurserymen have long known the desires of the planters, and have graded their trees as to size and height, and set the prices accordingly. The larger the tree, the more vigorous it was believed to be for orchard planting. Little thought has been given to the different size trees as to ease with which they may be transplanted from the nursery to the orchard, the kind of tree to be produced, and the kind that is the most productive.

An experiment was started by this Station to determine the best grade of peach trees for planting. Six trees of each grade were secured and planted. A duplication was made each year for four consecutive years. The trees of each grade were measured at the end of each growing season and a count of the fruit was made just before the ripening period to de-

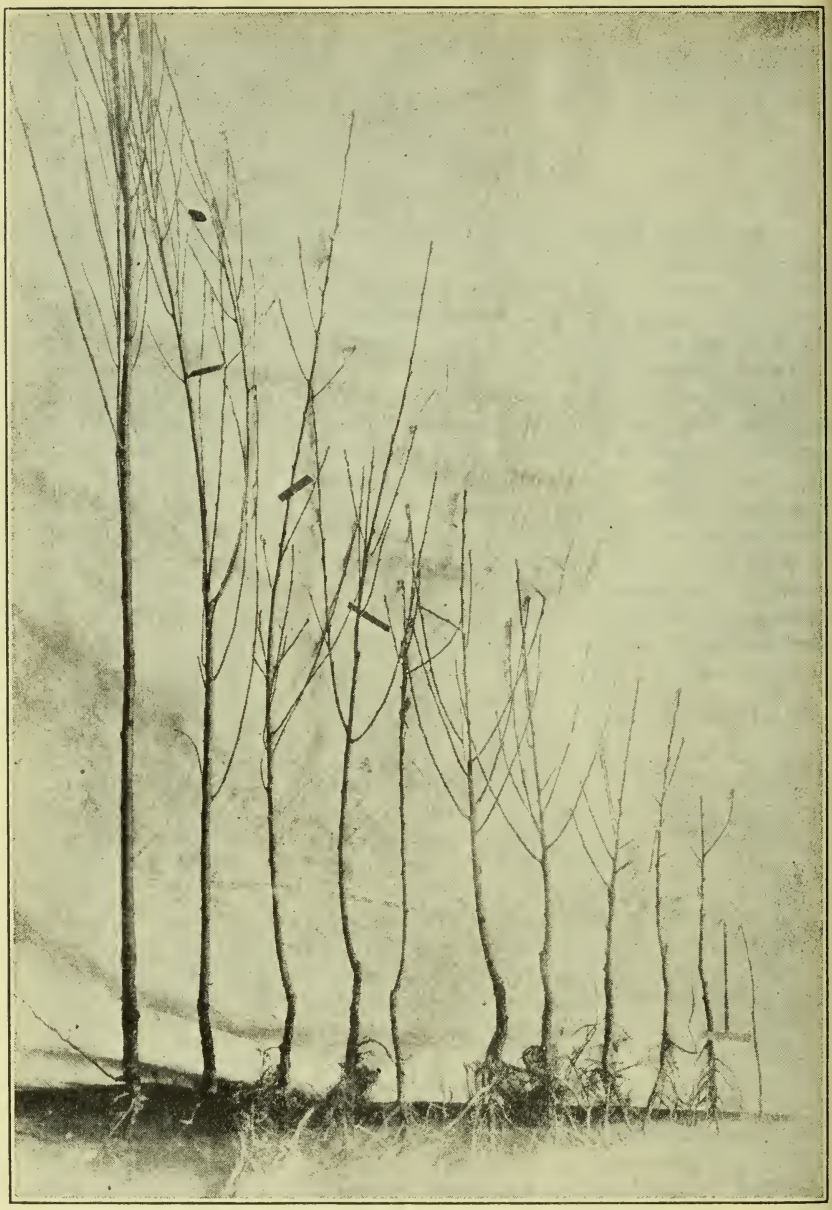


Fig. 1—The ten grades of peach trees as they were received from the nursery

termine the number of fruits on each tree and to determine the best grade to plant. The trees were purchased each year from a reliable nursery, so that representative trees of each grade would be had. Each grade was carefully planted and uniform methods of pruning, spraying, cultivating, etc. were employed. In order to determine the grade making the best trees, annual measurements were made of the leaders, and a count of the number

of leaders; also notes were made as to lateral branches of leaders, if any, and per cent of fruit bud setting.

PEACH TREE GRADES

June-buds are divided into six different grades, according to height. These grades range from four inches to four feet. While the smaller grades make a poor appearance when dug from the nursery, they transplant readily, as most of the root system remains on the tree. Most of the six grades are straight whips well supplied with buds; while the others are well branched, may be headed at the desired height, and may easily be shaped into desirable trees.

The other group of peach trees offered consists of one-year or dormant budded trees. They are budded in August and kept dormant until the following spring, at which time they are allowed to grow. Sometimes, these trees are sold according to height and sometimes according to caliper, or both. The trees used in this experiment were graded according to height, and will be spoken of in terms of height rather than caliper throughout this bulletin. The one-year trees are divided into four grades, three to four foot, four to five foot, five to six foot, and six to seven foot. Trees of the five to six and the six to seven foot grades could not be secured in 1922. The root system of the one-year group is fair, having grown in the nursery for two seasons. A goodly portion is cut off by the tree digger. As the old rule is applied—take as much off the top as is removed from the root—the tree receives rather a severe shock. Owing to the shock of pruning both top and root, the tree starts growing rather slowly. Many roots are broken, and after proper root pruning, only a minimum root system is left. The tops are heavily branched with few exceptions, and are headed high by the the nurserymen; thereby making it impossible to make desirable headed trees in the orchard.

Fig. 2—12 to 18 inch June bud at end of first season's growth. Note head 14 inches high

Fig 3—18-24 inch June bud at end of 1st season's growth. Note head 23½ inches high

Above is given a description of the different grades as they are received from the nursery. In the following is a brief description of the trees as they have grown in the orchard.

A careful record has been kept on the per cent of June buds and one year old trees that died from transplanting. The two hundred and eight June buds show a dead list of nine or four and three-tenths per cent, while the hundred and sixty-three trees of the one year olds show a loss of thirty-two or nineteen and six-tenths per cent. If the trees sold for the same price, the greater loss of one year trees by transplanting would warrant the planting of June buds. In checking over the grades of June buds, the greatest loss was in the four to six inch trees and the trees to four foot, the largest size. While there was very little difference in loss of the different grades of one year trees, the heaviest loss was with the six to seven foot grades, with an average over the four year period of twenty-five per cent. A ten per cent loss was shown with the four to six inch grade and a five and nine-tenths per cent loss with the three to four foot June buds. The other four grades show an average loss of one and nine-

teen hundredths per cent or twenty-three and one-tenth per cent less than the six to seven foot grade which is sold for the highest price.

In growing an orchard tree, the first consideration is the kind and quantity of fruit produced.

It is mentioned above that larger and older trees have been advertised as coming into bearing more quickly than the June buds. A careful study of charts one, two, and three will show that each grade of June buds produced more fruit than did any grade of one year trees. The only exception was with the four to six inch trees in the first crop. In the second crop this grade was above the best of the one year trees. The average of the crops of the plantings of this grade is six per cent above the average of the crops of the highest producing one year grade. An average of all the crops of June buds and of one year trees shows that 21.5 per cent more

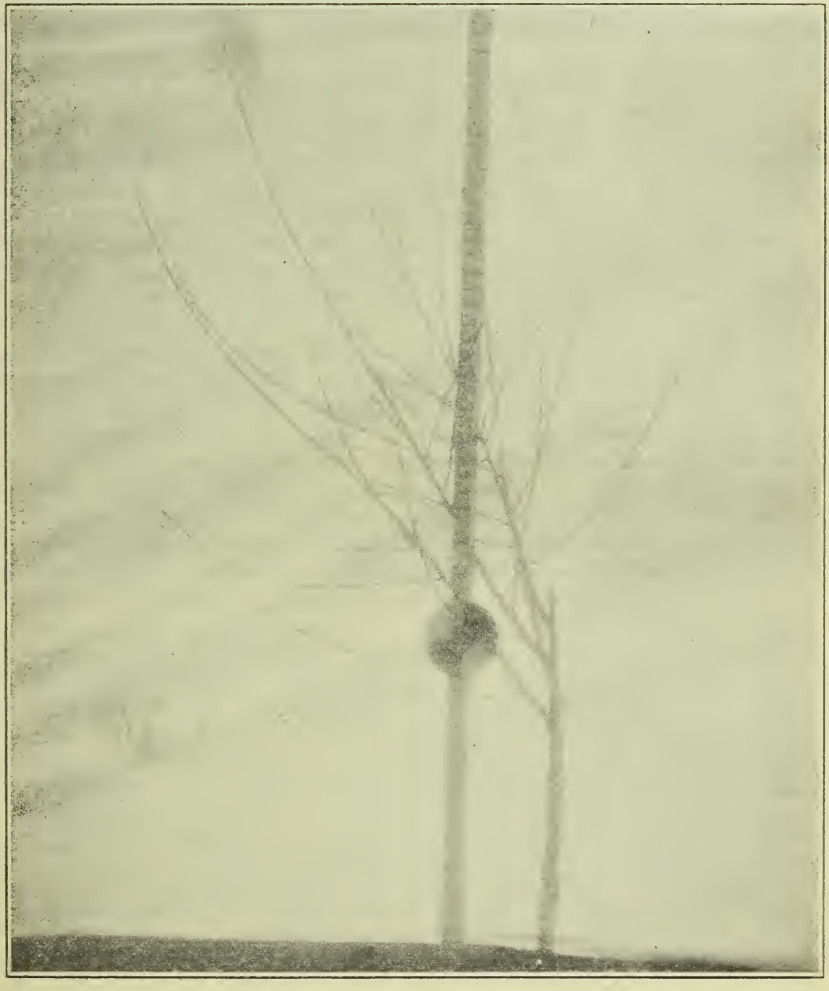


Fig. 4—Large one-year trees at end of 1st season's growth. Note the branches on one side making it practically impossible to properly shape tree. Many of the one-year grades produce this type tree.

Fig. 5—Note trees on left are 4 to 6 inch June buds and trees on right are 3 to 5 foot one-year trees. Note difference in vigor.

fruit was produced by the June buds. The 1925 crop of Elbertas of the 1921 planting shows forty-four per cent more fruit per tree for June buds than was produced by the one year trees. The twelve to eighteen inch June buds proved to be the most productive of all the ten grades. The three to four foot size of the one year trees has yielded the most fruit. In comparing the two grades it is to be seen that the best grades of June buds produced thirty per cent more fruit than was produced by the best grade of one year olds.

A comparison was made of the six to seven foot one year trees with the twelve to eighteen inch June buds as to cost. The data shows that the twelve to eighteen inch June buds in all plantings average nineteen and three-tenths per cent better trees than the six to seven foot trees. The records at hand tend to show that we are paying ten times the money for trees that produce less than half the fruit, when we purchase six to seven foot trees instead of the twelve to eighteen inch June buds. The fruit produced by the twelve to eighteen inch grades of the 1922 planting shows an average of thirty four and seven-tenths per cent more fruit than the four to five foot trees, the largest grade of one year trees sold that season.

The 1919 census reports 593,651 trees not of a breeding age. As peach trees begin to bear at three years of age, we may assume this number of trees not of bearing age are one and two years old. By dividing this number in half we find the annual plantings to be 246,825 trees. The average selling price for one year trees is fifty-five cents, and the average price for June buds is nine cents. If the people of Mississippi will purchase June buds instead of one year trees, it would mean an annual saving of $113,539.50, and twenty one and five tenths per cent better producing trees.

In comparing the different grades of June buds, there is no significant difference in the growth of the first four grades. There is less than 1½ per cent difference between the four to six inch and the six to twelve inch grades. The shape of the tree varies slightly, owing to the distance they are headed above the ground. If the terminal bud is pinched out of the four to six inch or the six to twelve inch trees, they head too low. If allowed to grow without pinching, the tendency is to form a central leader and if not headed at the proper time, it is hard to get a properly shaped

tree. The twelve to eighteen inch and the eighteen to twenty-four inch trees make the best shaped trees of any of the grades. They transplant readily and there is no heading back to do. The grades, six to twelve inch, twelve to eighteen inch, and eighteen to twenty-four inch, show very little difference in the total averages of tree growth. The next two grades of June buds fall behind the four grades mentioned more than twelve per cent in average of total growth.

The trees of these two grades proved the most vigorous of June buds in the nursery row, and, owing to this vigor, have been thought to be the best trees for planting. In comparing the growths, as shown on the chart, there is a gradual decrease in growth in the orchard opposite to that shown in the nursery row. The only way that the falling behind of the larger grades may be accounted for is the shock received in transplanting. The larger the trees, the greater the shock. In checking over the four grades of one year trees, there is a variation of fifteen per cent in the total average, while in the 1921 planting there is a difference of thirty-two per cent between the four to five foot and the six to seven foot grades. The three to four foot grade has made fifteen per cent more growth than the six to seven foot grades of the 1921 planting.

The tendency of the larger trees is to grow shoots of the water sprout type, which have few laterals or fruit buds and not the bushy tree of some of the other grades. Such heavy growth requires drastic pruning, in order to secure the proper shape, and if not severely pruned, the tree becomes so tall that spraying and the harvesting of the fruit is difficult.

In averaging the growth and number of leaders made by each planting, the first year through the fourth planting, six to twelve inch June buds gave the greatest average number of leaders, growth of leaders, and number of laterals. This grade was third in production of peaches in the first crop and second in the second crop. The twelve to eighteen inch grade bore the most fruit of any of the grades. The eighteen to twenty-four inch made the best headed trees. The quality and size of fruit was just as good on the heavy producing trees as on the lighter producing ones.

In summing up the above, June buds are cheaper; express and freight rates are less on this grade; they are easier to plant and make grow; there is less heading back to be done; they are easier to shape into a desirable tree; and they are more productive.

Fig. 6—Trees on left are 3 to 5 foot one-year trees, and those on right are 6 to 12 inch June buds. Note difference in vigor.

The charts were drawn representing the average number of crates produced. The 1921 planting of Elbertas shows an average of two and one half crates for five crops on the eighteen to twenty-four inch trees, with one and one-fourth crates on the six to seven foot trees. The crop for 1929 is not given due to an outbreak of pinhole borers in some plots.

The charts for 1922 planting of Hileys show twelve to eighteen inch trees with an average of three and one-third crates for a six year average. The best one-year average was 1927 when the above grade produced an average of six crates. The best average for one-year trees for six years is two and one-fourth crates. The best crop was produced in 1927—four and one-fourth crates.

The 1927 crop of 1923 planting was quite irregular. The 1923 planting was placed on a rather poor, droughty soil, to which is largely due the irregular crops. The crops of this planting are not in line with those of other plantings.

SUMMARY

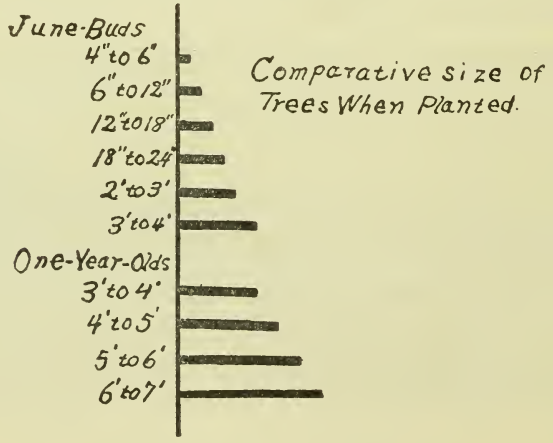
June buds are an average of 83% cheaper than one-year old trees, and produce 21.5% more fruit.

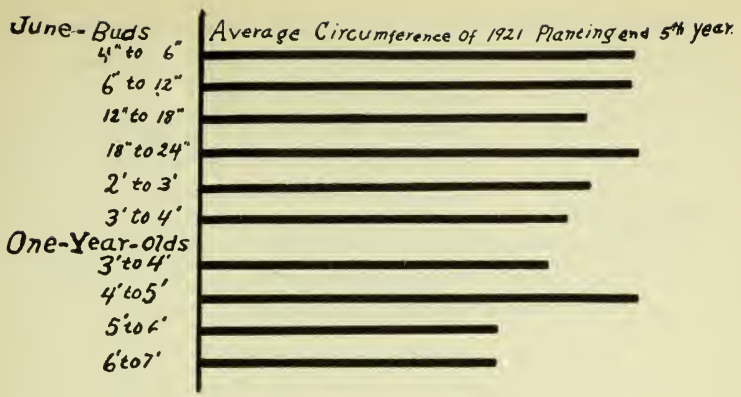
There is 15% more loss in transplating one year trees than in June buds.

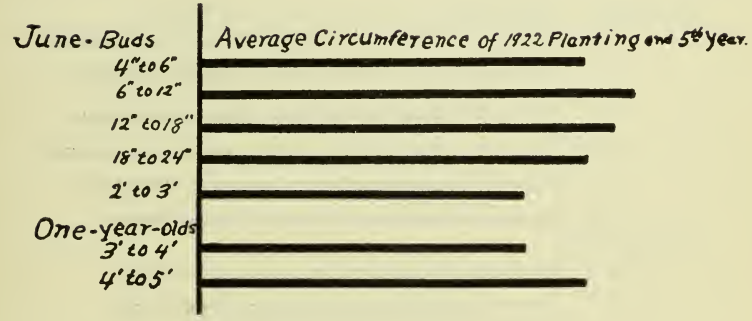
The twelve to eighteen and eighteen to twenty-four inch June buds are the most desirable of all the ten grades for orchard planting. The trees are not overgrown, the bountiful supply of fresh vigorous buds along the young trunk makes it possible to form a perfect head.

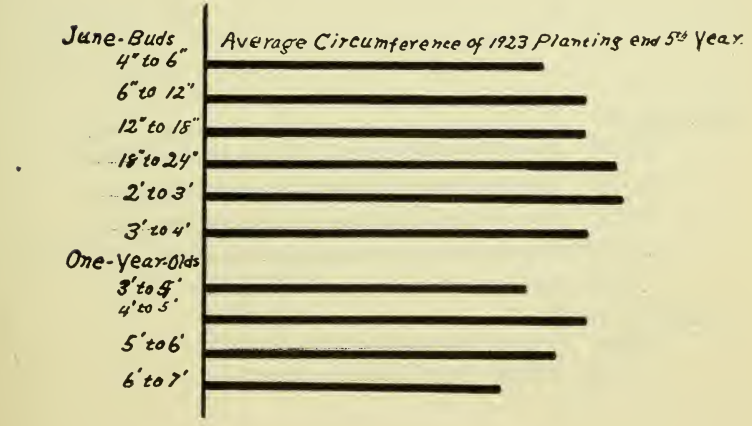
The annual potential saving to Mississippi would be $113,539.50 if June buds are purchased instead of one-year old trees.

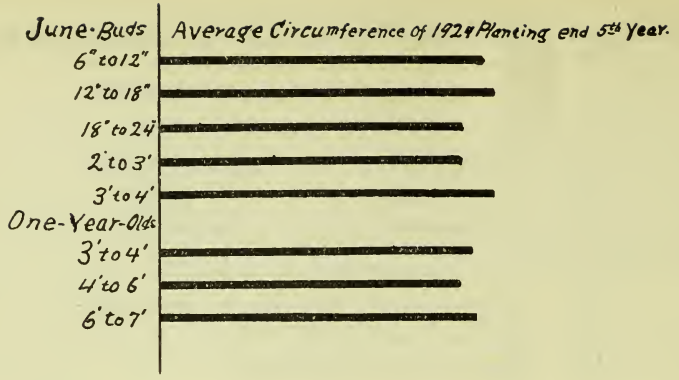
Extra large one-year trees are very hard to shape and rarely make good trees.

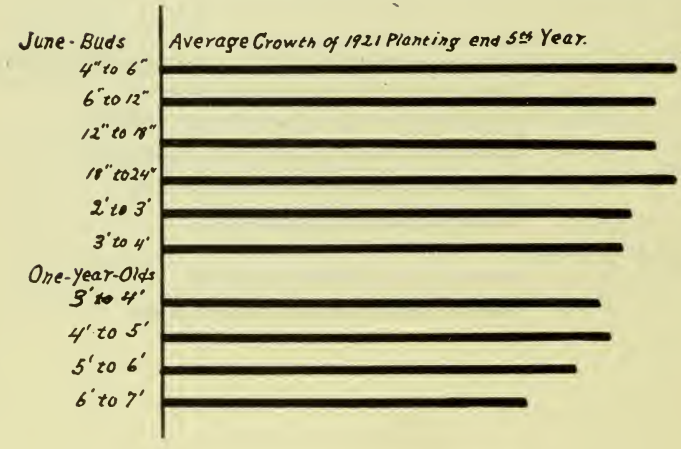


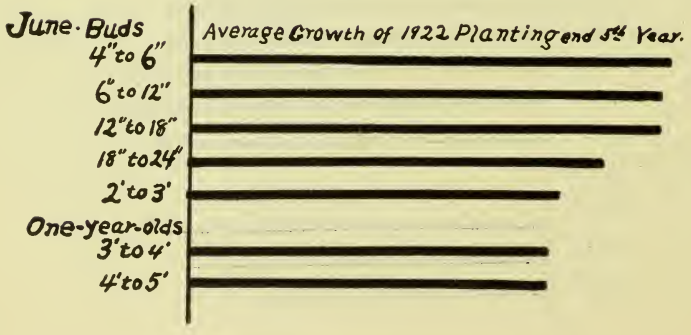

June-Buds
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'
Average Circumference of 1921 Planting end 5th year.

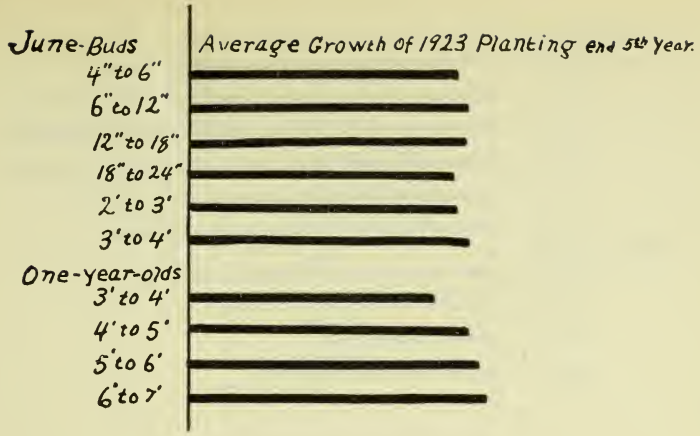

June-Buds
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-year-olds
3' to 4'
4' to 5'
Average Circumference of 1922 Planting end 5th year.

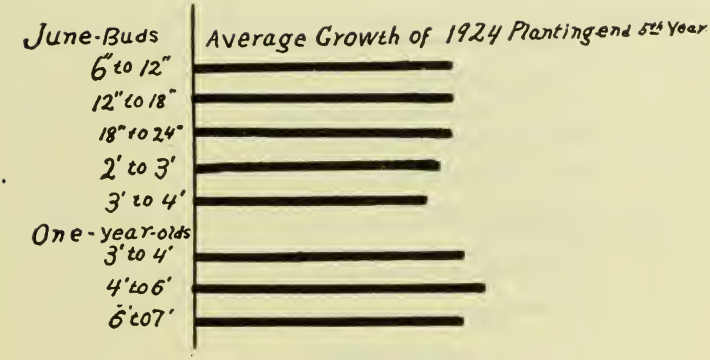

June-Buds
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'
Average Circumference of 1923 Planting end 5th Year.

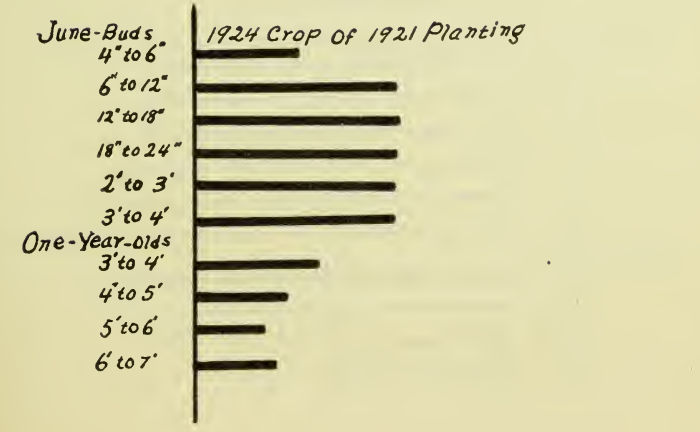

June-Buds
Average Circumference of 1924 Planting end 5th Year.
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 6'
6' to 7'

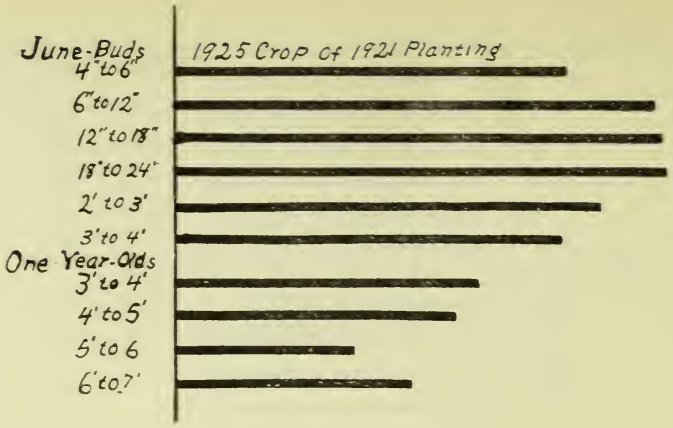

June-Buds
Average Growth of 1921 Planting end 5th Year.
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'

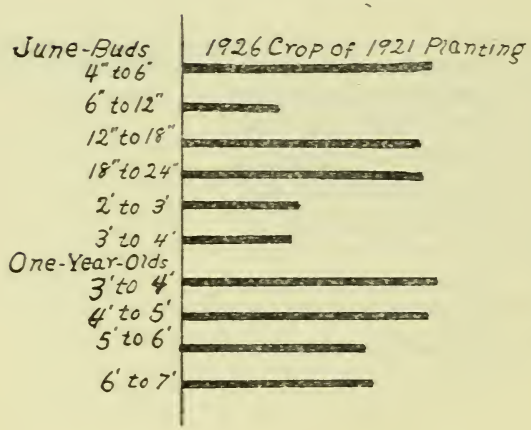

June-Buds
Average Growth of 1922 Planting end 5th Year.
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-year-olds
3' to 4'
4' to 5'

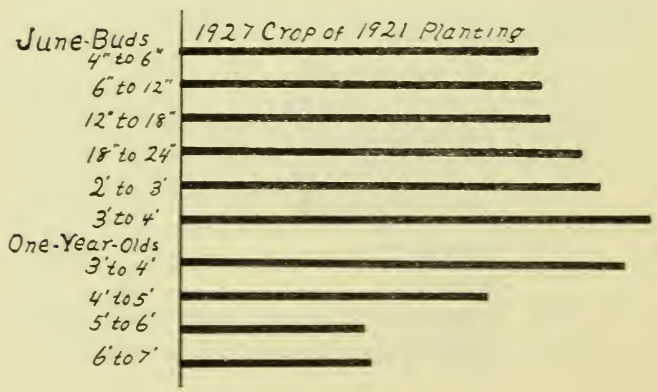

June-Buds
Average Growth of 1923 Planting end 5th Year.
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-year-olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'

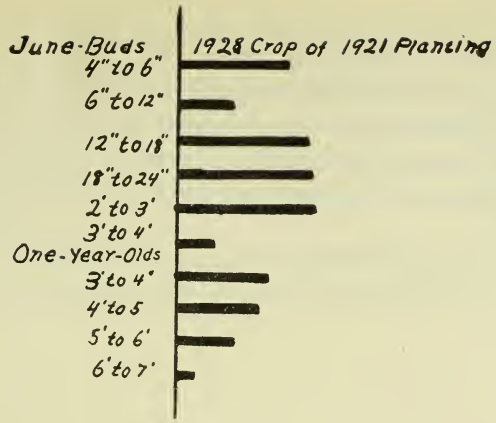

June-Buds
Average Growth of 1924 Planting end 5th Year
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-year-olds
3' to 4'
4' to 6'
6' to 7'

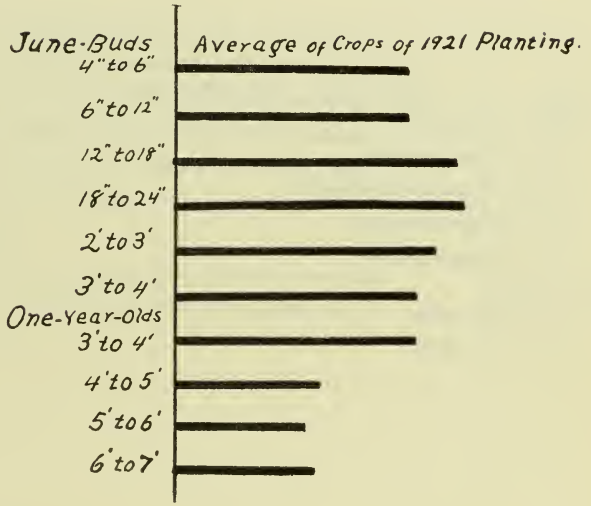

June-Buds
1924 Crop of 1921 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'

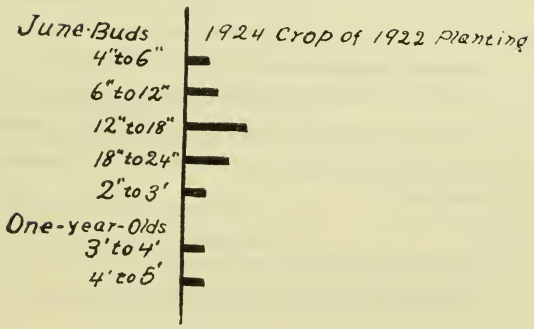

June-Buds
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'
1925 Crop of 1921 Planting

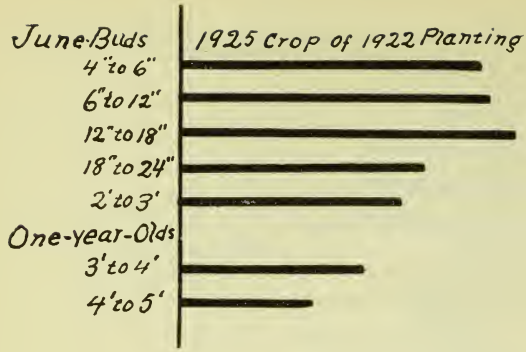

June-Buds
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'
1926 Crop of 1921 Planting

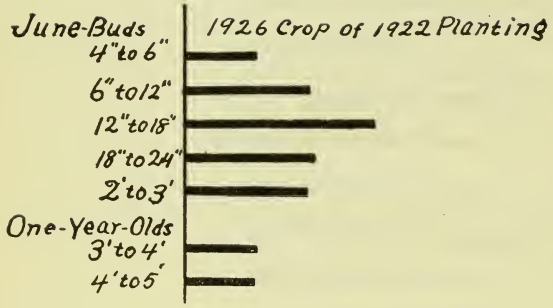

June-Buds
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds
3' to 4'
4' to 5'
5' to 6'
6' to 7'
1927 Crop of 1921 Planting

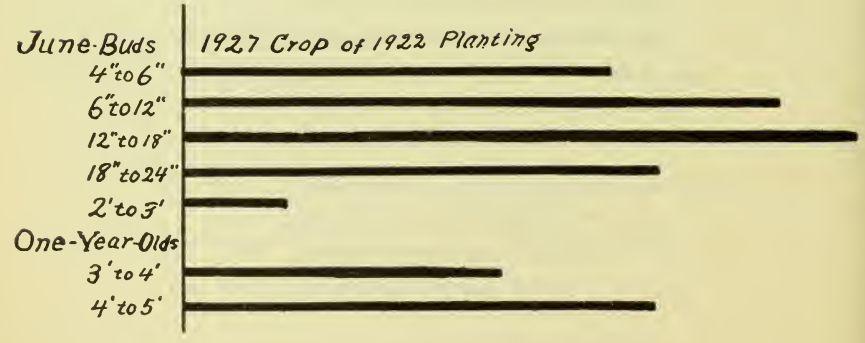

June-Buds
1928 Crop of 1921 Planting
4"to6"
6"to12"
12"to18"
18"to24"
2'to3'
3'to4'
One-Year-Olds
3'to4'
4'to5
5'to6'
6'to7'

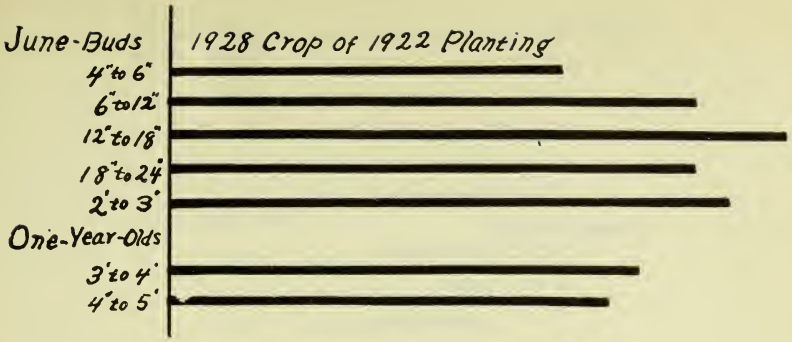

June-Buds
Average of Crops of 1921 Planting.
4"to6"
6"to12"
12"to18"
18"to24"
2'to3'
3'to4'
One-Year-Olds
3'to4'
4'to5'
5'to6'
6'to7'

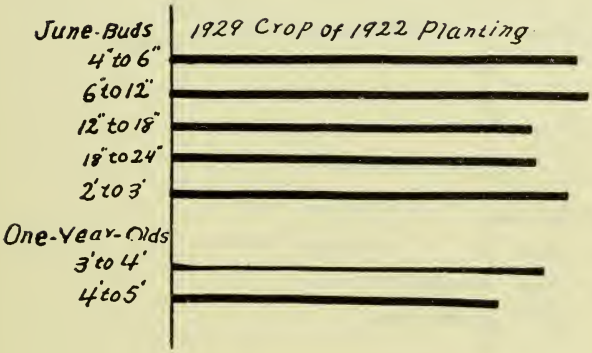

June-Buds
1924 Crop of 1922 Planting
4"to6"
6"to12"
12"to18"
18"to24"
2"to3'
One-year-Olds
3'to4'
4'to5'

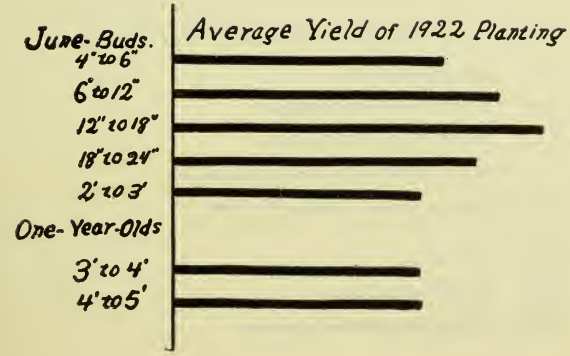

June-Buds
1925 Crop of 1922 Planting
4"to 6"
6"to 12"
12"to 18"
18"to 24"
2'to 3'
One-year-Olds
3'to 4'
4'to 5'

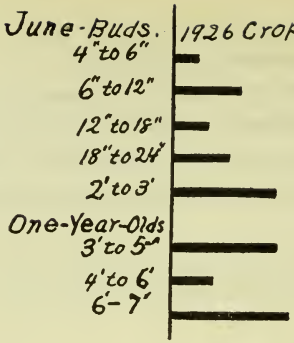

June-Buds
1926 Crop of 1922 Planting
4"to 6"
6"to 12"
12"to 18"
18"to 24"
2'to 3'
One-Year-Olds
3'to 4'
4'to 5'

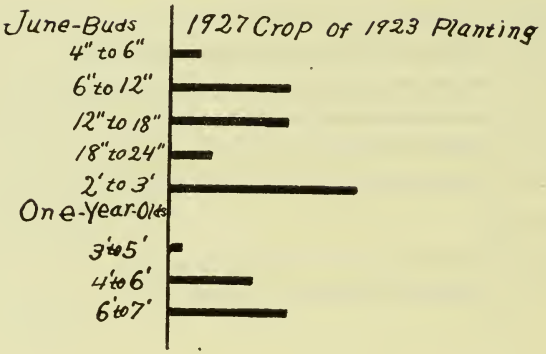

June-Buds
1927 Crop of 1922 Planting
4"to 6"
6"to 12"
12"to 18"
18"to 24"
2'to 3'
One-Year-Olds
3'to 4'
4'to 5'

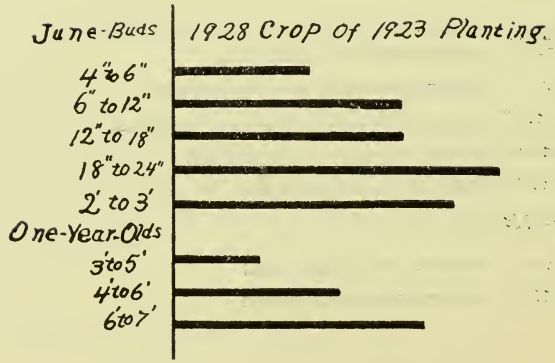

June-Buds
1928 Crop of 1922 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-Year-Olds
3' to 4'
4' to 5'

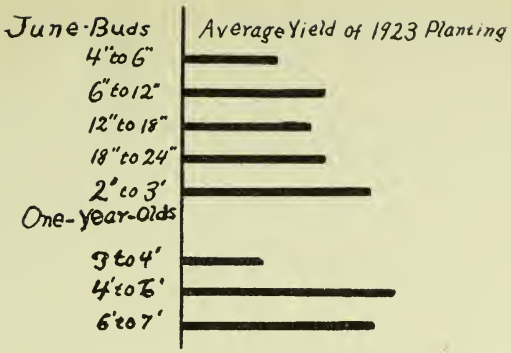

June-Buds
1929 Crop of 1922 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-Year-Olds
3' to 4'
4' to 5'

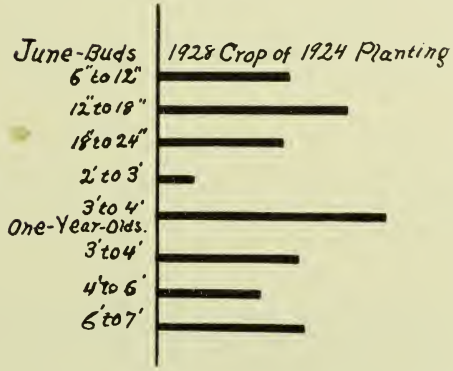

June-Buds.
Average Yield of 1922 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-Year-Olds
3' to 4'
4' to 5'


June-Buds.
1926 Crop of 1923 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-Year-Olds
3' to 5'
4' to 6'
6'-7'


June-Buds
1927 Crop of 1923 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-Year-Olds
3' to 5'
4' to 6'
6' to 7'


June-Buds
1928 Crop of 1923 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-Year-Olds
3' to 5'
4' to 6'
6' to 7'


June-Buds
Average Yield of 1923 Planting
4" to 6"
6" to 12"
12" to 18"
18" to 24"
2' to 3'
One-year-Olds
3' to 4'
4' to 5'
6' to 7'


June-Buds
1928 Crop of 1924 Planting
6" to 12"
12" to 18"
18" to 24"
2' to 3'
3' to 4'
One-Year-Olds.
3' to 4'
4' to 6'
6' to 7'