NUMBER 12 NOVEMBER 1952

TREE PLANTERS' NOTES

A Publication for Nurserymen and Planters
of Forests and Shelterbelts

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CONTROLS FOR WEEDS, DISEASES, AND PESTS

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

WASHINGTON 25, D. C.

Errata for Tree Planters' Notes # 12

In Tree Planters' Notes 12 an error exists in a conversion factor given in Charles Mony's article, "A Simple Guide to Understanding Fertilizers'.'. To correct your copy make the following change --

Page 15, line 9. Change "9.83" to "0.83".

TREE PLANTERS' NOTES NO. 12

Controls for Weeds, Disease and Pests

This issue of Tree Planters' Notes presents several articles on weeding, soil treatment, and fertilizers, and an annotated list of four publications deserving of consideration by nurserymen and tree planters. The articles are:

The four publications are:

Plants and Gardens - Spring Quarter, 1952

This publication of the Brooklyn Botanic Gardens contains a wealth of information about dozens of chemical sprays of all types for killing plants. Lists of specific killers for hundreds of named species of plants are given. If you want to learn some of the latest facts about herbicides or have a weed which has resisted your sprays thus far, this book is worth consulting. Its price is $1.50 per single copy ($1.00 in lots of ten to colleges and Government agencies) and is obtainable from the Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn 25, New York.

Using Commercial Fertilizer -- Commercial Fertilizers and Crop Production

Malcom H, McVickar, Chief Agronomist of the National Fertilizer Association.

This well illustrated book of 200 pages would be ideal for a person who wants to learn the what and why of fertilizers. With a primer-like simplicity it explains why fertilizers work on the plants, how they work, how to test for them and how to apply them. Its price is $3.00, and it can be bought from the Interstate Printers and Publishers, Danville, Illinois.

Forestasan -- A Deer Repellent.

This is a 12-page mimeographed collection of reports from experiment stations widely scattered over the nation concerning the use of a deer repellent developed in Germany. Persons who are concerned with deer depredations may find this report of interest. Copies of it may be secured free by request from the Chief, U. S. F. S., Washington 25, D. C.

Job Calendar for TVA Forest Nurseries

This is a multilithed booklet listing on a page for each month the various jobs of operating the nursery which must be accomplished that month. Although the list applies to a TVA nursery it is very appropriate for nearly any nursery. Copies may be obtained free by request to the Tennessee Valley Authority, Division of Forestry Relations, Norris, Tennessee.

GRAZING GEESE

West Virginia Conservation Magazine

Conservation Commission
Charleston 5, W. Va.

(Editor's note: The following article was published on page 6 of the August 1952 issue of the West Virginia Conservation Magizine. It is based on actual experience in using a flock of geese to weed nursery seed beds at the West Virginia state nursery at Lesage.)

Take a gander at these geese. They're saving a lot of back-bending and a worthwhile sum of money at the State Forest Nursery at Lesage.

Turned loose in a bed of nursery stock, such as evergreens or multiflora rose, the geese go down the line pulling and breaking off the weeds and grass and leaving the stock undisturbed.

All that is necessary to confine them to the desired area is a three-foot high portable chickenwire fence.

Nursery Superintendent Hobart Woodrum figures that the 13 geese at Lesage have saved the taxpayers $750 so far this season.

While the practice of using geese as weeders is not entirely new, it is beleived to be new in this state. In recent years, berry growers in the West and Mid-west have discovered that they could cut labor costs by using geese.

At present, there are 13 Chinese white geese on the labor force at Lesage. The project still is in an experimental stage, but Woodrum says there is reason to believe the experiment will succeed and he plans to double the flock next year, with a correspondingly greater saving.

Chinese white geese are used because they are smaller than most of their kind and are less likely to trample the nursery stock.

The 13 geese at the nursery now are the remnant of 15 goslings purchased early in March. By July 15, the geese, their feed and equipment, had cost $47. Labor expended in their care amounted to about $195. When it is figured that they have done work that would have cost 10 to 12 hundred dollars, the profit, or saving can be set at roughly $750 to $950.

Though the geese appear to be a success as nursery laborers, there is no possibility that they ever will entirely replace the old-fashioned back-bending, hand-pulling method of weeding. There are some jobs they just can not do.

In tiny, one-year-old stock, they are strictly for the birds. They are likely to trample it or clip it off before they recognize it for the tough, distasteful stuff it is. And there are some kinds of stock they will graze even when it is two years old or has grown to the usually safe size of 2-1/2 inches.

Geese seem to have a fondness for red pine, though they will not bother its close relatives such as white, Scotch, Virginia or short-leaf pine.

Besides the pines, geese have been used successfully at Lesage to weed beds of seedling Norway spruce, multiflora rose, and new rye from poplar beds while straw was on seedbeds during very early stages of germination.

About two and one-half million seedlings were produced last year on the 20-acre nursery at Lesage. The bill for weeding was approximately $12,000. Just how much geese can reduce this remains to be seen.

Next step in the project will be use of geese as laborers at the other Forestry Division nursery at Parsons, Tucker County.

Another great potential use for geese, if the fox problem can be overcome, Woodrum believes, is in the Christmas tree plantations which are becoming increasingly popular with farmers as a means of supplementing income.

These plantations need mowing for the first two or three years to reduce competition. Even after the trees have grown big enough to fend for themselves, geese can be valuable in cropping grass and weeds that would be a fire hazard when dried.

Now the problem facing Woodrum is what to do with the geese when the growing season is over. Could they economically be kept over the winter? Or would it be better for them to spread Thanksgiving joy?

COMMENTS ON GRAZING GEESE

Hobart G. Woodrum

Asst. Nursery Superintendent, W. Va. State Forest Nursery
LeSage, West Virginia

(Editor's note: Along with the article from the West Virginia Conservation Magazine, Mr. Woodrum sent a letter of further explanation and comments which are given below.)

Over and above the article material, I would like to make mention of the following observed information:

(1) Geese weeding is practical only in 2-0 or large 1-0 nursery stock

(2) I would use geese as weeders only where stock is of low stand density. (Possibly where seedbeds were of thin density due to poor germination, grub damage, previous lifting, etc.).

(3) Geese are fairly particular about what they eat. (Will eat most grasses, plantain, chickweed, etc., which are the bulk of our pesty weed crops.) The fact that geese don't prefer to eat evergreens, winterberry, multiflora rose, indicates they are choosy about their eating.

(4) I would not weed geese in beds of good density, as the plants themselves crowd out the weed crop.

(5) Geese weeding does not cultivate seedbeds. Also, weeding by hand after weeding by geese takes half again as long to weed.

(6) Geese droppings are of importance, as they improve the soil.

(7) Some grain feed is necessary for the diet of geese. It has been noted that they will get weak on only grass diet.

(8) Foxes are a problem with geese. Geese should be penned at night, not necessarily sheltered.

(9) At the present, I would say that it is impractical to carry geese through the winter because of the cost of holding over.

(10) Geese-weeded seedbeds are not as pretty to look at as hand-weeded beds.

USE OF 2, 4-D TO CONTROL WEEDS IN CONIFER NURSERIES

Nursery Superintendent, Chittenden Nursery, U. S. F. S.
Wellston, Michigan

Since 1947 the Chittenden Nursery has been conducting limited experiments on the use of 2, 4-D as a pre-planting and pre-sowing treatment to control weeds in the transplant beds and seedbeds. In all the experiments the 2,4-D (Sodium Salt) was applied at the rate of 6 pounds to the acre. The 2,4-D was dissolved in water and applied with the acid sprinkler. After the 2,4-D had been applied the beds were given a good watering and then watered every few days. At least 15 days were allowed to elapse between treating and transplanting and 30 days or more between treating, and sowing. After the beds have been treated the soil should not be worked.

In all the transplant areas the early germinating weeds have been greatly reduced. The transplant beds were treated and planted in the fall of 1949. At the time of the first weeding in the spring of 1950, there was an average of 2 weeds to the square foot in the treated beds as against 22 per square foot in the untreated beds. Most of the weeds in both the treated and untreated beds were perennials or annuals that were resistant to oil sprays. The control in the transplant beds in other years has been comparable to the results obtained in 1950.

In the fall of 1950 several beds in the transplant area were treated with 2,4-D in early August and planted in late August along with untreated beds. By the first part of September the untreated beds had a heavy infestation of weeds, whereas the treated beds were practically free of weeds. Survival has always been slightly higher in the treated beds and the seedlings have a better color.

The use of 2,4-D as a pre-sowing treatment has not proved as satisfactory, perhaps because it is necessary to stir the soil before sowing. While the number of weeds was reduced, the reduction was not sufficient to warrant the expense of the treatment. The 2,4-D treatment has not affected the germination of conifer seed in any of the treatments to date.

Where fall transplanting is done or where the early weeds are perennials or resistant to oil sprays, the use of 2,4-D as a pre-transplanting treatment has greatly reduced the weeding cost.

EXPERIENCES IN USING ALLYL ALCOHOL FOR WEED CONTROL

Hugh Steavenson

Proprietor, Forrest Keeling Nursery
Elsberry, Missouri

(Editor's note: The following paragraphs are from a letter sent us by Mr. Steavenson.)

We treated a few acres both seasons using 15 gallons of alcohol and 5,000 gallons water per acre. The alcohol is diluted with 4 parts of water and metered into the suction side of our portable sprinkler-type irrigation system.

A decrease in weed population was secured both seasons, although most effective results were had this spring. I attribute greater effectiveness in the spring to the fact that our beds were worked repeatedly during the early winter and spring until May when the alcohol was applied. Thus we believe that many of the more resistant seeds had germinated and were destroyed by cultivation prior to the alcohol application.

The grass-type weeds were more effectively controlled than certain broadleaf weeds. For example, population of smartweed and sedge was about as great in the control plots as in the treated area and these two weeds have been particularly troublesome in the fall-treated area. Smartweed, as you know, has a hard, horny seed coat, apparently resistant to alcohol. Whether the heavy population of sedge came from rootstalks or whether the seed of the species is resistant I do not know.

I would say that allyl alcohol as we applied it is by no means as effective as the standard methyl bromide treatment, but of course the former is much more economical.

The danger in using allyl alcohol cannot be over-emphasized. In spite of the fact that our application was almost automatic and the operators were protected with gas masks and rubber gloves, they nevertheless became ill from time to time from the alcohol fumes. The fumes are extremely irritating to the eyes, nasal passages, and throat. This difficulty is not a serious problem in small plot applications but in large scale applications it seems almost impossible to avoid some exposure to the gas.

Because of the toxicity of this substance, I believe the Shell Company, manufacturers of allyl alcohol, have withdrawn the product from the market for soil-treating purposes, although it may be available through other sources. Incidentally, I note the excellent article on the use of allyl alcohol in the June 1 52 issue of Journal of Forestry, and will say that the observations in the article seem to be borne out very closely by our experience.

FERBAM CONTROLS NURSERY WEEDS

R. M. Allen, Forester

Gulfcoast Research Center, Southern Forest Experiment Station
United States Forest Service
Gulfport, Mississippi

Ferbam, a fungicide used on pine nursery seedlings, has given striking pre-emergence weed control in a small test at a south Mississippi forest tree nursery.

In this test, Ferbam and allyl alcohol, alone and combined, were applied in water as soil drenches at total rates od 10,890 gallons per acre. Amounts equivalent to 50 gallons of allyl alcohol and 500 pounds of Ferbam per acre were used. Application was in April, 3 days before longleaf pine seed was sown.

Sixty-seven days after sowing, the nursery plots were weeded. Green weights of weeds removed per square foot of nursery bed were: untreated plots 60.25 grams; plots drenched with allyl alcohol, 2.88 grams; plots drenched with Ferbam, 0.25 gram; plots drenched with both alcohol and Ferbam, 0.12 gram. Neither chemical reduced the density of the seedling stand.

A good pre-emergence weed killer is needed in forest tree nursery work. Allyl alcohol is rather difficult to apply and is hazardous to use.. If further tests show that Ferbam or some related chemical gives effective and economical weed control, it will be a marked improvement in nursery weeding technique. (This article from Southern Forestry Notes #80)

GREEN MANURE CROP CAUSES SEEDLING MORTALITY

H. B. Wycoff

Nursery Superintendent, Mason State Nursery
Topeka, Illinois

During the past three summers, green manure crops have been grown on most of the available area in the Mason State Tree Nursery located in Central Illinois. The green manure crop consisted of cowpeas or soybeans and sudan grass . This crop was plowed under before it matured seed. This practice was suggested by soils men as a step toward maintaining the soil in an intensively cropped nursery area. The soil is sandy, low in pH, nitrogen, and organic matter. In some cases, red and white pine were seeded following this cover crop. This was done with some misgivings due to published warnings that similar practices had sometimes resulted in seedling mortality. This information seemed to be a little too general and vague to apply to all situations, in view of the fact that the soil needed improvement, and the area was needed for seedling production.

The following table shows the history of 16 adjoining seedbeds over a 7-year period. All beds were in continuous northern conifer seedling production during the 7-year period, except beds nos. 5 through 12 which grew a green manure crop of cowpeas and sudan grass in 1949. The green manure crop was plowed under while green. In the spring of 1950, all 16 beds were prepared and seeded in the same manner on the same day with the same lot of seed An 8-row seed drill was used. The soil in beds nos. 5 and 12 was in better condition than the others, which were somewhat cloddy due to the lifting of 2-0 Jack pine that spring. The table shows the inventory of 2-0 red pine in these beds during the summer of 1951. It will be seen that the 8 beds which had been in continuous tree seedling production for at least 7 years produced 293,000 seedlings, whereas the 8 beds which had a green manure crop in 1949 produced only 106,000 seedlings.

It appears that the cowpea-sudan grass green manure crop resulted in a 64% reduction in the production of red pine seedlings through damping-off losses in 1950. It would require 2.76 times as much nursery area and cost to grow red pine seedlings under the latter conditions.

Bed No.	Inventory 1951	Total Green Manured Area	Total Continuous Seedling Area
1	33,840)		
2	35,820)	--	142,020
3	36,360)		
4	36,000)		
5	23,040)		
6	10,800)		
7	3,240)		
8	15,840)	106,380	--
9	16,380)		
10	7,380)		
11	13,860)		
12	15,840)		
13	32,760)		
14	37,620)	--	151,020
15	32,940)		
16	47,700)		
		106,380	293,040

The above is the best example, for which data are available, of a situation which has occurred in all cases where similar conditions existed during the last 2 years.

The nursery soil variation and production schedule make a cover crop, transplant, seedling rotation impossible. Some of the nursery area shows signs of fatigue from repeated cropping. Soil fumigation is a costly, but thus far a very effective, method of overcoming the effect of green manure on the subsequent seedling crop. Removal of the green manure crop from the seedbed area seems to be a fairly effective method of preventing seedling mortality. Present policy has been to shift from the use of green organic matter to brown organic matter, and to commercial fertilizers for nutrients on seedbed areas. Green manure crops will continue to be grown on transplant and hardwood areas in the nursery. Enlargement of the nursery may reduce the intensity of cropping and permit a longer rotation, and the growing of organic matter.

There are a number of questions which should be answered through research:

(1) What is the effect of various green manure crops on the production of various species of trees?

(2) What are the relationships between green manure crops, soil organisms, and tree seedlings?

(3) By what means, if any, other than the use of green manure crops or large quantities of peat, can a nursery soil be maintained under intensive use?

METHYL BROMIDE CONTROLS SOIL ORGANISMS WHICH CAUSE MORTALITY OF EASTERN WHITE PINE SEEDLINGS

H. B. Wycoff

Nursery Superintendent, Mason State Nursery
Topeka, Illinois

Damping-off diseases have caused heavy losses of northern pine seedlings for many years at the Mason State Tree Nursery in Central Illinois near Topeka. Various factors have contributed to the prevalence of damping-off. Two factors believed to be important are the hard well water used for irrigation and the plowing under of green manure crops. Both of these factors are believed to be favorable to the development of fungi which cause damping-off.

The alkalizing effect of the irrigation water and subsequent evaporation is believed to stimulate the growth of certain soil organisms. These soil organisms then attack the trees. A considerable degree of control has been attained through the development of a post-emergence treatment of seedbeds with an iron sulphate solution. Cultural practices which reduce evaporation and the need for irrigation have also been effective.

For at least 4 years we have observed that all forms of damping-off as well as root rot occurred in seedling beds on areas where green manure crops had been plowed under prior to seeding. The green manure crops were usually a mixture of sudan grass, cowpeas, and soybeans. The usual cultural practices and acidification failed to prevent this mortality of seedlings on such areas as it did where no green manure crops were used.

The preceeding article, "Green Manure Crop Causes Seedling Mortality," presents data in support of this observation. In one case the following situation was reported: "It will be seen that the 8 beds which had been in continuous tree seedling production for at least 7 years produced 293,000 seedlings, whereas the 8 beds which had a green manure crop in 1949 produced only 106,000 seedlings*" Except for the presence of a green manure crop on the one area for one season, the two areas were as nearly identical in soil and management as could be hoped for. Many similar observations were made, but data was not collected in most cases.

In 1950 we anticipated that the necessity of making seedbeds on land that was in green manure crops would probably result in heavy damping-off losses in 1951. It was felt that jack pine and fall-seeded white pine would have the best chance of survival under these conditions.

We considered the possibility that fumigation of the soil with methyl bromide containing 2% chloropicrin might control the soil organisms involved. The equipment and material did not arrive until late in October. There had been no rain since October 8th. The beds were already formed for fall seeding of white pine. We were fortunate to have a period of warm weather from the 28th

to the 31st of October. The high temperatures during this period ranged from 79 to 90 F. and the low temperatures ranged from 41 to 59 F. The wind was strong.

The weather and the equipment available permitted the treatment of 16 plots, each 100 feet long. The treated plots were separated by 100 foot untreated check plots. The plastic fumigation cover used permitted the treatment of two 100-foot plots at a time. Four covers were used. This permitted the fumigation of 8 plots on October 28th and 8 plots on October 30th.

Four levels of treatment were used. The treatments were randomized mechanically. One-, two-, three-, and four-pound treatments were applied to 4 plots each. Each level of treatment was applied to 2 plots simultaneously since the 13-1/2 x 100-foot fumigation cover covered 2 adjoining plots.

In the fall of 1951, the usual 2% inventory of 1-0 stock was taken. This included the treated plots and check plots. The mechanical method sampling all beds resulted in a more or less random sampling of the experimental plots and controls. Two samples were obtained from each of the 16 treated plots and controls by the nursery workers making the inventory counts as a part of their regular work.

It will be seen that plots Nos. 3 and 4 and the corresponding control plots were the only ones which were not preceded by a green manure crop. The untreated check plots associated with these treated plots had about three times the stand density of the control plots where a green manure crop preceded the treatment. However, these treated plots averaged more than twice as many trees per foot as there were on the check plots. This indicates that under "normal" conditions fumigation increases the stand density about 100% even though only 1 pound of fumigant was used per 100 square feet.

No noticeable difference resulted from the use of various amounts -- 1 to 4 pounds -- of fumigant under favorable conditions. The limited amount of data probably does not warrant statistical analysis. The fact that the highest average density resulted from the 2-pound treatment is not believed to be significant. Results from the 1- and 3-pound tests are less complete and uniform than the 2- and 4-pound tests.

Treatment of plots Nos. 11, 12, 15, and 16 was incomplete due to the fact that the wind blew the covers off before the 24-hour treating period elapsed. The number of hours of treatment are not known, since the time when the covers blew off, releasing the fumigant, is not known. The stand density of these treated plots is significantly lower than the average for the treated plots in three out of four cases. This indicates that the length of treatment time is important.

The results of all 16 tests, including exceptionally good and exceptionally poor results, were included in Table I in order to present a picture of what can be expected in practice. The average untreated sample contained 32 trees. This represents an average increase of 104 trees or 384% per foot of bed. The tests were made under conditions known to be unfavorable for the production of northern conifer seedlings susceptible to damping-off.

TABLE I

Summary of Sixteen Tests of Methyl Bromide Containing 2% Chloropicrin for the Control of Soil Organisms

Bed No.	Date 1950	Lbs. MC-2 per 100 sq.ft.	Remarks	Average No. of trees per foot of bed		Increased Stand Due To Treatment	
				Treated	Untreated	No. trees per foot	Percent of increase
1	10/28	2	Preceded by green manure crop	195	28	167	596
2	10/28	2	" " " " "	219	27	192	711
3*	10/30	1	Preceded by tree seedling crop	197	83	114	137
4*	10/30	1	" " " " "	172	97	74	76
5	10/28	4	Preceded by green manure crop	147	19	128	674
6	10/28	4	" " " " "	162	30	132	440
7	10/30	4	" " " " "	156	39	117	300
8	10/30	4	" " " " "	83	18	65	361
9	10/30	3	" " " " "	171	30	141	470
10	10/30	3	" " " " "	169	30	139	463
11*	10/30	3	Preceded by green manure crop, fumigation cover blew off, pre-maturely	72	11	61	555
12*	10/30	3	" " " " "	137	23	114	496
13	10/28	2	Preceded by green manure crop	122	26	96	369
14	10/28	2	" " " " "	138	27	111	411
15*	10/30	1	Preceded by green manure crop, fumigation cover blew off pre-maturely	17	12	2	42
16*	10/30	1	" " " " "	27	18	9	50
Total				2184	517	1665	6151
Average				136	42	104	384

*Results influenced by factors not common to the rest of the tests.

The ten tests which were most nearly uniform show the following results:

TABLE II

Plot No.	Lbs. of Fumigant Per 100 sq.ft.	Stand Inventory: Ave. No. Trees/Ft. Treated	Stand Inventory: Ave. No. Trees/Ft. Untreated	Increased Stand Due to Treatment: Trees/Ft.	Increased Stand Due to Treatment: Percent of Increase
1	2	195	28	167	596
2	2	219	27	192	711
5	4	147	19	128	674
6	4	162	30	132	440
7	4	156	39	117	300
8	4	83	18	65	361
9	3	171	30	141	470
10	3	169	30	139	463
13	2	122	26	96	369
14	2	138	27	111	411
		1562			
Average	3	156	27	129	479

A SIMPLE GUIDE TO UNDERSTANDING FERTILIZERS

Charles C. Mony

Nursery Superintendent, Vallonia Nursery, U. S. F. S.
Vallonia, Indiana

Commercial fertilizer is identified by means of a numerical formula (as 5-10-5) which tells how much of each of the three principal plant nutrients it contains. The first number in this formula always refers to the percent of nitrogen (N) in the mixture, the middle number indicates the percent of phosphoric acid (P_2O_5), and the last number refers to the percent of potassium oxide (K_2O). Some mixtures which are commercially available are:

5	-	10	-	5	0	-	0	-	50
0	-	20	-	20	3	-	12	-	12
20	-	0	-	0	4	-	12	-	8
0	-	20	-	0	6	-	8	-	4
0	-	44	-	0					
(Nitrogen) (% N)		(Phosphorus) (% P_2O_5)		(Potassium) (% K_2O)	(Nitrogen) (% N)		(Phosphorus) (% P_2O_5)		(Potassium) (% K_2O)

The conversion factors given below make it simple to convert the formula into pounds of plant food nutrients available in a given weight of fertilizer and, conversely, to compute the weight of fertilizer that must be applied to secure a desired quantity of nutrient. The factors and the way to use them are as follows:

Factors -

Factor to convert nitrogen	- None. Use the formula figure.
Factor to convert P205 to P (phosphorus)	- 0.45 (approximately)
Factor to convert K20 to K (potassium)	- 9.83
Factor to convert P to P205	- 2.29
Factor to convert K to K20	ł . 2

Example:

In 600 pounds of 6-8-4 fertilizer the following nutrients are available:

600 x 6%	= 36.0 pounds of nitrogen
600 x 8% - 48 pounds of P205 x 0.45	= 21. 6 pounds of phosphorus
600 x 4% - 24 pounds of K20 x 0.83	= 19.9 pounds of potassium

SOME OBSERVATIONS ON THE USE OF THE TRANSPIRATION INHIBITOR "PLANTCOTE" ON LIFTED TREE SEEDLINGS

Service Forester, State of California
Placerville, California

For the past three years small quantities of seedlings of white fir, red fir, Douglad-fir, sugar pine, and Sierra redwood have been treated by dipping the tops and roots in a solution consisting of one part Plantcote and two parts of water. Since Plantcote forms the best films at temperatures above 70 degrees F. and since lifting operations generally are carried on during cool weather, the seedlings were subjected to warm air from the ventilator of an oil furnace until the shiny film was formed on the needles or foliage. No effort was made

to shield the roots from the warm air during the drying operation. This treatment was followed by packaging in sugar pine shingle tow, and the packages were stored in an unhumidified cold room with temperatures maintained near 38 degrees F.

Packaged, treated seedlings have been kept in an unhumidified cold room for 1 to 2 months prior to planting, with no apparent damage from drying out. Sierra redwood (1-0) seedlings were planted after 4 months of storage and no early seedling mortality after planting occurred.

No molds have developed on seedlings treated immediately after lifting and stored in a cold room for a period of 2 months. However, several small lots of seedlings received from other nurseries, and treated after receipt, developed molds within 10 days to 2 weeks while in the cold room.

Treated sugar pine seedlings (1-0) showed survivals of 30-35 percent on burned southwest slopes at an elevation of 3,200 feet in the Sierra-Nevada Mountains. Treated white fir seedlings (2-0) showed survivals of 70 percent one year after planting on a burned-over gentle east slope at the same elevation.

In planting operations with a planting bar, seedlings were exposed to mild air temperatures for several minutes with no apparent harm.

The action of Plantcote in preventing excessive water loss does not appear to be definitely known. Some investigators believe that the film is permeable to gaseous molecules of carbon dioxide and oxygen, but not to molecules of water vapor. The literature states that growth is slowed up at first but later exceeds that of untreated plants. The film is ruptured easily by growth, and apparently there is a holding action in the tops of seedlings until satisfactory water relations are established by the roots.

After observing the results of this treatment it appears as if its use will give the nurseryman and planter more leeway in all of the ordinary operations from lifting to planting of seedlings where drying-out is a factor.

PLANTCOTE is a vinyl resin latex to which certain ingredients are added to obtain three formulations, namely, transplanting, cut-greens and Christmas trees, and cut-flowers. The basic substance of these formulations is known as Good-rite Latex VL 600. It may be purchased in commercial quantities or for experimental purposes from the B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. The prices are as follows: in 5-gallon containers for $6.50 per gallon, Domestic price schedule, and for $4.88 per gallon, Formulators price schedule, F. O. B. their plant, Louisville, Kentucky.

The transplant formulation of Plantcote may be purchased from Newton Chemical and Supply Co., Bridgeville, Delaware for $8.00 per gallon, list price, in gallon lots, F. O. B. Bridgeville,

(Editor's Note: This data is given for information only, and implies no recommendations of the firms named or their wares, nor any guarantee of their business standing or financial responsibility)

Invitation

All persons who work in reforestation, or who are interested in it or some allied field are invited to send in material for publication in Tree Planters' Notes. If their material is not yet in final form for publication, they are invited to at least send a letter to Tree Planters' Notes and tell what they are doing and what manner of information should be published. The address is: Chief, Forest Service, U. S. Department of Agriculture, Washington 25, D. C.

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Tree Planters' Notes will be sent upon request to persons and organizations doing reforestation work, and to libraries, forest schools, and similar appropriate places. The address is given above.