7/12/72 10,000

FACT SHEET

L-1032

PINE BARK GROWING MEDIUM INCREASES HOTHOUSE TOMATO PRODUCTION

Charles L. Stayton and Don Portie*

East Texas' wood-using industries produce more than 1,902 tons of bark daily. Much of this is burned or dumped because uses for bark have been lacking. Because recent research results indicate that bark is an excellent mulch and soil conditioner, local markets should be established to eliminate waste of this valuable material.

The Texas Agricultural Extension Service, in cooperation with U. S. Plywood-Champion Papers, Inc., Pasadena, Texas, has established an adaptive research program in the Houston area to show the value of bark for field, vegetable and hothouse tomato production and new lawn establishment. This fact sheet deals only with hothouse tomato production.

WHY BARK WAS TESTED

Pine bark is a valuable ingredient as a standardized growing media because it is easily identified, readily available, free from toxicity even after steaming, has uniform characteristics and is handled easily, mechanically or manually (1).

Use of a standardized growing medium for hothouse tomato production is desirable because it eliminates variation from different soil type mixtures.

Pine bark has become an accepted product for mulch and soil conditioner. Home gardeners who have used bark mulch prefer it over peat because of particle size, moisture holding capacity and appearance. Haynes (3) stresses the importance of the higher lignin content of bark which is more resistant than cellulose to micro-organism attack (composting). Because bark has 10 to 15 percent more lignin than wood, it lasts longer than wood or other woody plant material.

Dunn and Latimer (2) have demonstrated the effectiveness of bark mulch in tomato, cabbage, rose, blueberry and raspberry production. Sproull (4) states that mixed Southern pine bark mulch increased tomato production from 20 to 57 percent and improved fruit quality during a 4-year test.

PINE BARK IS BEST GROWING MEDIUM

Research Farms, Houston, Texas, in cooperation with U. S. Plywood-Champion Papers, Inc., Pasadena, Texas, and the Texas Agricultural Extension Service, conducted an extensive growing media test during the spring, 1971. U. S. Plywood-Champion Paper's bark processing plant provided the pine bark to be compared with cane pulp, rice hulls and peat moss for hothouse tomato growing media.

The five growing media treatments are (1) ½ pine bark + ½ vermiculite, (2) ½ rice hulls + ¼ peat moss + ¼ vermiculite, (3) ½ sugar cane pulp + ½ vermiculite, (4) ½ sugar cane pulp + ¼ peat moss + ¼ vermiculite and (5) ½ peat moss + ½ vermiculite. These media were tested in 50-foot long check plots, all receiving the same fertilization treatment (Sheldrake Formula).

*Respectively, Extension area forestry specialist — wood products and Harris County associate agent, Texas A&M University, Overton and Houston.

Texas A&M University • Agricultural Extension Service • John E. Hutchison, Director • College Station

Charlie Otsuka, manager, Research Farms, recorded tomato production and material breakdown over a 3-month period.

The decomposition rate of the five treatments showed pine bark lasted longer with 95 to 100 percent not broken down. In comparison to bark, only one-third of the cane pulp, two-thirds of rice hulls and three-fourths of the peatlite mixes had not decomposed, figure 1. Thus, bark should last one and one-thirds to three times as long as the other materials, significantly reducing the amount of growing media required over several years.

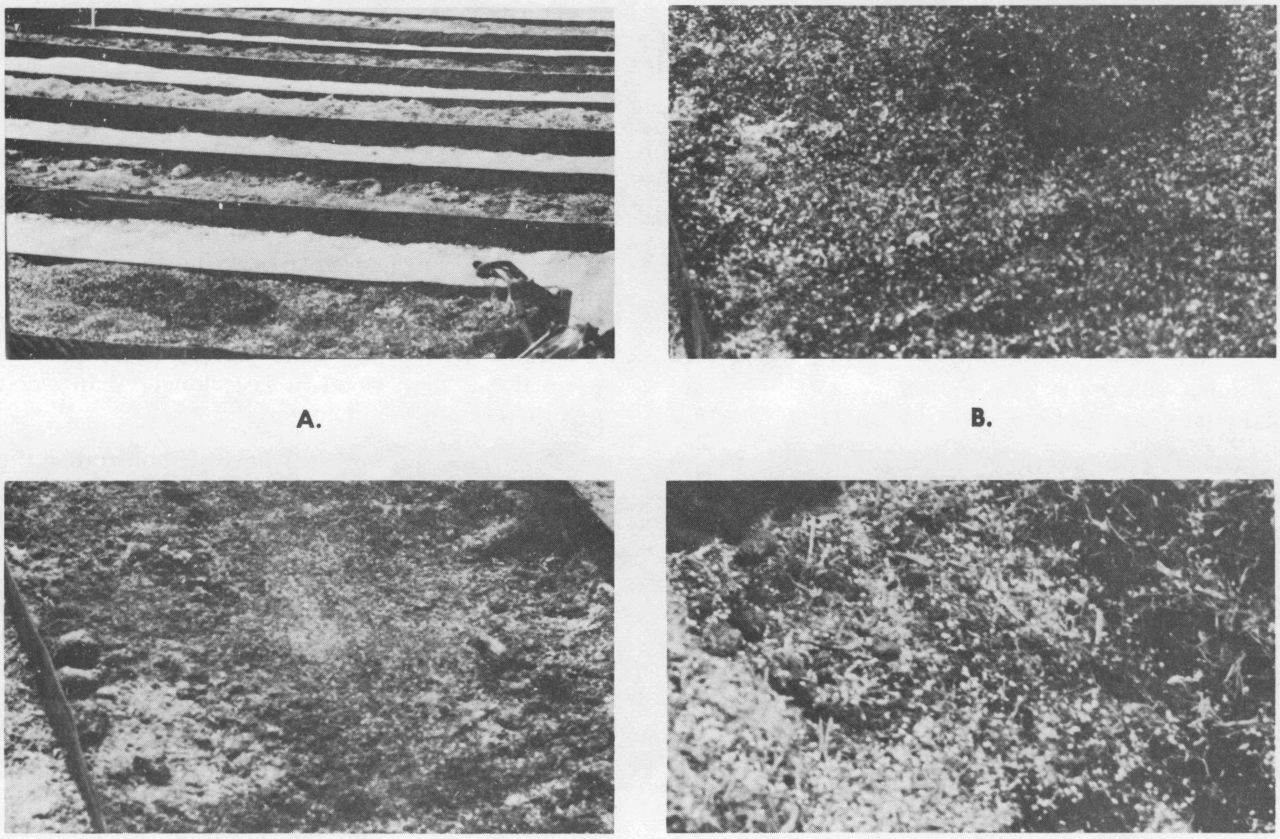
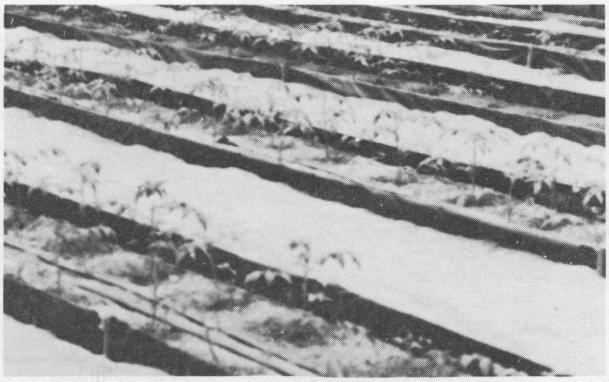
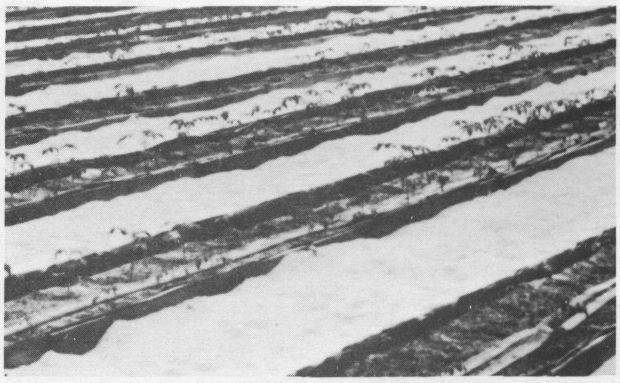


Fig. 1. (a) Five treatment beds after harvest—left to right: 1) bark-vermiculite, 2) rice hulls—peat moss—vermiculite, 3) sugar cane pulp—vermiculite, 4) sugar cane pulp—peat moss—vermiculite and 5) peat moss—vermiculite. (b) Almost 100 percent of bark had not broken down. (c) Approximately one-third of the rice hull mix had broken down. (d) Removing sugar cane pulp added for next crop, shows approximately two-thirds of sugar cane pulp mix had broken down.



A.



B.

Fig. 2. Tomato plants growing in pine bark mix (a) in one-half of research farms greenhouse far exceeds those in rice hull mix (b) in other half of same greenhouse.

Tomato production was highest for the pine bark growing medium as shown below:

Treatment	Total pounds	Pounds/ plant	Percent increase using pine bark
1. ½ pine bark + ½ vermiculite	723	6.34	——
2. ½ sugar cane + ¼ vermiculite + ¼ peat moss	689	6.04	4.7
3. ½ peat moss + ½ vermiculite	634	5.56	12.3
4. ½ sugar cane + ½ vermiculite	595	5.20	17.7
5. ½ rice hulls + ¼ peat moss + ¼ vermiculite	558	4.88	22.8

CONCLUSIONS

Pine bark increased hothouse tomato production 5 to 23 percent when compared with other accepted growing media and decomposed only slightly with 95 to 100 percent remaining for the next growing cycle. Pine bark is about $5 to $7 per yard as compared with about $20 per yard for peat moss and sugar cane pulp. Rice hulls are usually available at no cost except for hauling.

In addition, Research Farms found that pine bark mixes easier than any of the other growing media material, making it even more desirable as a greenhouse material, figure 2.

If a hothouse operation has 20,000 plants, the use of pine bark increases returns by approximately $2,520 when compared with the sugar cane and peat moss mixture, assuming a value of 42 cents per pound for tomatoes. When pine bark is compared with rice hulls, the increased production returns would be approximately $12,264. These increased returns do not take into consideration the lower cost of pine bark, longevity and its handling ease. Thus, it would seem that pine bark growing medium offers great opportunity for increased economic returns in hothouse tomato production.

LITERATURE CITED

1. De Werth, A. F. 1971. The Use of Pine Bark in the Production of Ornamental Crops. Texas A&M University, Texas Agricultural Experiment Station Report MP-991.
2. Dunn, S. 1956. The Influence of Waste Bark on Plant Growth. University of New Hampshire, Durham, N. H. Agricultural Experiment Station Bulletin 435.
3. Haynes, D. L. 1968. Champion Processed Bark – As a Mulch – As a Soil Conditioner. Technical Bulletin No. 1. U. S. Plywood-Champion Papers, Inc., Hamilton, Ohio.
4. Sproull, R. C. 1969. Fiber, Chemical and Agricultural Products from Southern Pine Bark. Forest Products Journal, Vol. 19, No. 10.

Cooperative Extension Work in Agriculture and Home Economics, Texas A&M University and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.
10M—5-72 FOR 4