Project Number: 82-X4
Project Leader: Tretheway
Project Names: Brush Utilization - Densifying and Transporting Brush (Exerpt of 1982 Annual Report Summary Booklet dated March 1983; no annual report from research located



## Section IV - Almond Brush Utilization Research

Project No. 82-W4 - Brush Utilization
Mushroom Compost

Project Leader: Dr. Joo I. Kim (209) 294-2681 or 294-2861
Department of Agricultural Industry and Education
California State University
Fresno CA 93740

Objectives: (1) To develop a ground almond brush composting technique for mushroom growing. (2) To develop a new composition formula of almond brush compost for higher button mushroom yield.

Interpretive Summary: A new prewetting method has been developed which substantially shortens the time needed to compost brush. While brush is prewetted, chicken manure (2.5 percent by weight) is added and this expedites brush breakdown. Using this new method, the prewetting and composting period for the brush-straw mixture described below is four weeks, while last year using traditional methods, it took seven weeks. For comparison, it takes three weeks to prewet and compost the traditional straw media.

Two almond brush composts were tested this season at the Fresno state mushroom growing facilities. Prunings used were shredded with a commercial tubgrinder using a one-inch screen. For one compost, shredded brush was substituted for wheat straw (74.66% of compost by weight). For the other, the 74.66% percent allocated to wheat straw was split so that half was wheat straw and half was almond prunings. The new composting techniques described above were used. The 50 percent almond brush compost gave 31 percent higher yields than the traditional straw compost (4.6 pounds/square foot from six flushes for the 50 percent almond brush compost compared to 3.5 pounds/square foot from the straw compost.) The 100% almond brush compost gave inconsistent yields.

The same experiments were run at Mills Mushroom Farms, Geyserville, except that traditional prewetting and composting techniques were used. Yields of the 50 percent almond brush compost and the traditional straw compost were equivalent. Again, yields from the 100% almond brush compost were inconsistent.

Brush imparts positive conditioning effects to the composting media by making it more flocculent. This increases aeration so that the anaerobic zone in the center of compost piles is diminished and improves pasteurization by permitting better steam penetration.

Project No. 82-X4 - Brush Utilization
Densifying and Transporting Brush

Project Leader: Donald G. Tretheway (916) 243-5831
CH2M Hill
1525 Court Street
Box 2088
Redding CA 96099

Objectives: To identify a feasible and cost-effective method for removing, processing and transporting almond brush from the orchard to a potential buyer(s) of densified almond brush.

Interpretive Summary: An appropriation was made for this project to cover unanticipated brush utilization research needs which may develop during the 1982-83 fiscal year. To date no services have been required and no funds have been spent.

Project No. 82-Y3 - Brush Utilization
Field Trials

Project Leader: George E. Miller, Jr. (916) 752-1896
Agricultural Engineering Extension
University of California
Davis CA 95616

Objectives: To develop a feasible and cost-effective method for removing, processing, and transporting almond brush from the orchard to potential buyers of densified brush.

Interpretive Summary: Two methods of brush densification have been identified: in-row and orchard-side densification. In-row densification involves use of a continuously-moving chipper or hammermill. In-row densification eliminates need for buck-raking but can cause damage to orchards and interferes with orchard activities. Orchard-side densification may involve the use of a semi-stationary hammermill, tubgrinder, chipper, baler or module builder in addition to loaders. All of this equipment has been field tested.

During 1982, Dr. Bryan Jenkins, UC Davis, designed, constructed and tested a module cutter. Demonstrations held earlier had shown that brush compacted by moduling and then cut into units of approximately one ton each could be ground through a tubgrinder about three times faster than brush not compacted. The cutter was tested in Fresno and then returned to Davis for modification.

A cooperative program was developed, presented and approved by the California Energy Commission for funding a heavy-duty module builder. The module builder was constructed by Taylor Machinery Corporation, Visalia. Weaver's Tree Service, Fresno, agreed to purchase it. Weaver's has the necessary support equipment including a Medallion 1010 tubgrinder and loading equipment. The module cutter will be loaned to Weaver's during the testing period. Actual operation of this line began in January 1983.

Other brush harvesting concepts have been developed by other parties and are either in actual operation or in experimental stages. These include Morbark chippers, Nicholson chippers, in-row shredders built by Rear and L.A. By-Products and an in-row harvester constructed by Tink. Also a baling concept using packer trucks is being developed.