AMBIENT AIR DRYING OF WALNUTS

J. Thompson, T. Rumsey, G. Martin

In the fall of 1978, a 12 foot diameter silo was fitted with an expanded metal floor and fan to allow its use for ambient air drying. Nuts at 27 to 30% moisture were loaded to a 12 1/2 foot height in the silo and dried to 8% moisture in six days. Conventional drying would take 24-30 hours for complete drying. A quality analysis by Diamond Walnut Inc. indicated no significant difference in mold, insect damage or color between ambient air drying and conventional drying. The energy costs for ambient air drying was $.38/ton versus an estimate of $5.00/ton for heated air drying.

In addition to the energy savings of ambient air drying, it proved to have the potential of increasing revenue to the grower by preventing overdrying. The minimum moisture of the nuts was 6.6% after a full day's exposure to warm air. During the next night the moisture increased to slightly over 8%. If fan operation were ended during the morning, an 8% moisture would be almost guaranteed in clear weather conditions. Insuring 8% moisture will also reduce shell damage caused by handling brittle, overdried nuts.

Development of a computer model to simulate ambient air drying is in progress. Laboratory equipment for determining drying characteristics of walnuts has been constructed. A limited amount of data has been taken. Additional drying data will require freshly harvested nuts next fall. Data on rehydration will be completed this winter. A computer program has been developed for simulating the drying process and will be used to optimize factors such as dryer size, airflow needed for lowest cost and lowest energy use. A comparison of the costs of owning and operating an ambient air drying system versus a conventional system will be made when the computer model is ready for use.