Abstract

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Title: Reversible air multi-purpose dryer

Text:

In Vietnam, over the past 20 years, several types of dryers have been developed at the Nong-Lam University HoChiMinh City and accepted by local farmers. Among these, the simple flat-bed dryer has been foremost in reducing post-harvest grain losses due to adverse rainy weather, with about 3000 units of capacities from 4 to 8 tons per batch. Good features of these dryers are: fairly high capacity, good grain quality, low drying cost, easy to install and operate. Nevertheless, as simplest dryers, they have to be changed to meet the needs for more-mechanized dryers at rice milling centers.

The series of SRA dryers (RA is abbreviation for Reversible-Air, S is drying in Vietnamese) have been designed to serve the above change. The research began in 1999 with a laboratory model for basic information about drying characteristics of various crops with reversible airflow. Next, a pilot 1.5-ton/batch SRA dryer was designed and tested with paddy and coffee. Finally, the dryer was scaled up to different models, of 2; 4; 6; 8; 10; and 12 tons per batch. Thirty SRA units have been applied successfully in various Provinces of Vietnam; of which 10 units have each dried 500-1500 tons in the past 3 years. Features drawn from testing and using these dryers are:

1. Saving of labor: No manual mixing is required during the drying period.
2. Saving of land space: The area for the drying bin is only half compared to that of a conventional flat-bed dryer.
3. Multipurpose: Drying of grains and other high-moisture products such as coffee beans, shrimp heads, corn-on-cob, longan fruit etc. Typical drying time for paddy from 28%MC down to 14%MC (wb) is 9 hr; for coffee from 60%MC down to 16%MC (wb) is 14 hr. With paddy, the final moisture differential is below 2%.
4. The investment and drying cost are not higher compared to a flat-bed dryer of similar capacity.

Based on the acceptance of the processing sector in the past 4 years, it can be anticipated that the reversible-air dryer SRA will play an increasing role for agricultural production in Vietnam. This is one logical step to increase the mechanization of post-harvest operations in the context of a developing economy.