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Understanding the Onion Storage Ventilation System

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Introduction

For many people involved in the onion industry the complexity associated with properly storing onions is often overlooked. The fact that we can store onions from one harvest to the next and maintain outstanding quality is taken for granted. The reality is that our ability to hold onions in long-term storage and deliver quality product months after harvest is directly related to advances in ventilation system design and management. The ventilation system is really the key to maximizing profits from storage. Once the onions are harvested and placed in storage, the ventilation system is the only tool we have to interact with the crop. Anything that we do to the onions will occur using the ventilation system. For example, the processes of curing, cooling to holding temperature and dehumidification are all driven by the ventilation system and its components. In short, the ventilation system is our life-line to the onions.

Ventilation System Design

The ventilation system can be thought of like an irrigation system, in that it is composed of many components, each one with a specific job. Also like an irrigation system, each component must be the right size and the right part, or the system will not function properly. Modern onion ventilation systems are complex and composed of a variety of different components. These commonly include fans, fresh air doors, refrigeration equipment, burner systems, de-humidification equipment and control systems. In order for the ventilation system to operate effectively and promote onion quality, it must be properly deigned, properly installed, and properly controlled.

Proper ventilation system design is the foundation for the success of all onion storage efforts. In order for a ventilation system to function as desired, it must be properly designed and each component must be correctly specified and sized. This is concept is the driving force behind the Gellert Certified Systems™ program. Certified Systems™ are engineered and designed to conform to specific standards for airflow rate, fan selection, fresh air door sizing, plenum sizing, duct sizing and configuration, exhaust sizing, refrigeration system capacity, burner system capacity, and controls. The fact is that each component within the system will impact all of the others, and must be selected correctly. For example, undersized fresh air door area will increase inlet air velocity, increase total system static pressure, and reduce overall system airflow and performance. By specifying and sizing each component based upon a wealth of practical experience, as well as the most advanced engineering techniques, the grower and storage manager can be assured of optimized system performance, maximized energy efficiency, and the best onion quality possible from a Gellert Certified System™.

Ventilation System Operation

Onion quality and storage profitability are maximized when the ventilation system is not only properly deigned, but also properly managed. Specific storage management practices vary with geographic location, status of the onion at harvest, ambient weather conditions, and intended end-use of the crop, but several fundamental concepts apply to every situation. First, it is critical that storage management decisions are based on the actual condition of the crop at harvest. Second, you must have the ability to control and modify the storage environment to precisely meet the needs of the onions. This means you must be able to accurately control airflow, plenum temperature, plenum humidity, and return air temperature and humidity. To ensure accurate control of all system parameters you must have a control panel that continually monitors these key factors and maintains the desired environmental conditions using an advanced, integrated control strategy. The Gellert Galaxy™ control panel provides the most advanced control capability, coupled with the most user-friendly programming found anywhere. This panel continually monitors all environmental parameters and

automatically controls all system functions, including refrigeration, burner systems, dehumidification equipment and airflow, to provide you with the ideal storage environment. Using advanced control logic, the Galaxy is as easy to use as simply selecting the desired operating mode and entering key set-point values.

Summary

Storage is the culmination of the enormous amounts of time, effort, and money required to produce the crop. Although it is tempting to view storage as simply piling onions in the building and turning on the control panel, it is really much more complex and important. The design, installation, and management of the ventilation system are the most critical components to successful storage. Remember, once the onions are in the building the ventilation system is our only line of contact and defense. Growers and storage managers who take the time to analyze their storages and implement the changes required to maximize onion quality and ventilation system performance will reap the rewards of improved profitability. For more information contact The Gellert Company (1-888-GELLERT), or your local Gellert Dealer.

This article was originally published in the September/October, 2004 Issue of Onion World magazine.