



OPERATING A PROFITABLE SMALL FARM

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FACT SHEET 10

Root Cellars

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I. Value of Root Cellars

Root cellars are as valuable to the crop producer today as they were many years ago. In fact, a case could be made that they may even be more valuable, since production costs and the value of produce is so much higher today. Root cellars, at one time, were the primary method of storing produce on the farm. However, modern developments in storage have pretty much replaced them on the farm. Some root cellars can still be found in use on farms.

While modern storage units for storing produce are effective, they may not be economically feasible on most small farms. There typically is not enough production, or crop value to support such an investment. A root cellar, on the other hand, can provide some storage and extend the life of your produce with a minimal investment. A root cellar can be a valuable asset to the small farm crop producer.

II. Considerations for Root Cellaring

There is a good deal of prior planning that should be done before you begin stuffing produce into a root cellar. Remember that one of the primary reasons for using the root cellar is to extend the quality of your produce. This assumes that the crop you put into the root cellar has quality to start with and that it has the capacity to maintain that quality in storage under proper conditions.

There are some crop production considerations that need to be addressed as you begin to plan production for a new season. These include the storage of some of your produce in a root cellar. These considerations will require some research on your part. You will need to select crops that can be stored, know how long crops can be stored under the conditions existing in your root cellar, and know what varieties of the crops maintain quality or store better.

Another consideration is total yield. Do not plant more than you need; it wastes money. Remember that the root cellar is only so big, whatever is left over from initial sales and cannot fit in the root cellar will be lost. Plan the level of production with consideration being given to the limitations of storage.

Some research needs to be done on the proper or best way to produce, harvest, and handle various crops for storage. The way some crops are grown in the field has a direct effect on how they last in storage. Excessive applications of nitrogen during a growing season can negatively impact upon the storage of some crops.

While there are many crops that can be successfully stored, there are some that should not be stored together. For example, apples should not be stored with potatoes. Apples give off ethylene gas which causes potatoes to sprout. Some thought needs to be given to the compatibility of various crops in storage.

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Sometimes a problem can be solved easily. For example, a ventilation system can be put in the root cellar to remove the ethylene gas produced by the apples.

The selection of crops and varieties with good storage qualities is not enough to ensure lasting quality in the root cellar. Different crops have different optimum temperatures and humidity levels for best storage. These optimum conditions need to be researched and followed if quality is to be maintained in the root cellar.

Produce is not the only item that can be stored in your root cellar. Some other items include sauerkraut, pickles, cured meats, cheese, mushrooms, and eggs. In a pinch, the root cellar can sometimes serve as a storm shelter if a funnel cloud is sighted.

III. Planning the Root Cellar

Just about anything you can think of can be used as a root cellar. Buried barrels, drain tiles, straw bales, covered metal cans, outbuildings, trenches, earth pits, basements, nooks and crannies of the home, or under the porch. The size and scope of your goals for the root cellar will determine the type of root cellar you develop.

Most producers will utilize the currently available resources to develop a root cellar. For example, if your house has a basement with a dirt floor, you have an ideal situation for developing a first-rate root cellar. If you prefer an outdoor root cellar, a hole can be dug in the side of a hill. There is potential for modifying almost anything on the farm into a root cellar. Research some guidelines on building root cellars.

Temperature

Temperature is the first item to consider when planning a root cellar, therefore a thermometer is a necessary tool of a well run root cellar. Produce needs to be kept cool in order to slow down the respiration process. A site that averages between 32 and 40° F will provide a good storage site. Temperatures averaging 40 to 50° F will provide only short-term storage. Root cellars can both borrow and keep cold through good insulation and the use of windows, ventilators, and exhaust pipes. Whatever resource you use, whether it is the corner of the basement, a hole dug in the side of a hill, or the old tool shed, be sure that it is adequately insulated and has at least some crude way to regulate temperature.

Humidity

Humidity is second only to temperature in importance to the term storage of produce. Shriveling and drying out are major problems with stored produce. Remember that the stored crops are no longer able to replace lost moisture through their root system. While the cool temperature slows down the crop's system, a high humidity will slow down evaporation and the loss of moisture from leaves and crop surfaces. For the most part, produce keeps best at a humidity between 90 to 95 percent. Humidity will be difficult to regulate in most root cellars, however, setting around pans of water or dampened burlap bags will help.

Ventilation

After temperature and humidity, ventilation is the next most important factor in root cellaring. Ventilation plays a significant role in the regulation of temperature and humidity in the root cellar. It also can be used to exit odors and undesirable gases, such as ethylene, when storing incompatible crops. There are various methods available to you to ventilate the root cellar. Often ventilation is as simple as using air intake and air outlet ventilation pipes. Correct air flow is essential to the efficiency of the root cellar. Remember that warm air rises and that cold air sinks when you install your air vents, and that you want air flow over the entire root cellar.

Accessibility

The easier the root cellar is to get in to, the more it is going to be used. If the root cellar is not in a convenient location, requires climbing up and down a ladder, or shaky old stairs, it is only going to be storing dust. Design your root cellar for convenience of use. Also, do not overlook how easy it will be to clean the root cellar when setting it up. Certainly the easier it is to clean the root cellar, the more often it will be done.

Darkness

Light will deteriorate some crops and cause the sprouting of others. Potatoes will develop a green skin that is toxic when exposed to light. While a light bulb in the root cellar is acceptable to use while you are in there, the light needs to be off when you leave. Also, if there are any windows in the root cellar, they will need to be shaded to exclude light.

Drainage

While it is desirable to have some dampness in the root cellar, you do not want it to become water-logged. There should be some accommodation made for excess water to be drained out of the root cellar.

Shelves

When constructing the shelving and storage bins inside your root cellar, remember that a well run root cellar is going to be cold and damp. The materials that you select for your shelves and bins should be able to tolerate these conditions. Oak is considered to be the best wood for use in root cellars.

Size

How large you make your root cellar is a good question. There are some factors that may help

to answer this question. One is the limitation of your resources. If the site that you have selected for your root cellar has a size limit, then its size is already predetermined. If you are going to use the root cellar as part of your farm business, you will need to plan ahead. Estimate your storage needs, so that you have enough space now and in the future. Estimating how big to make your root cellar is going to be difficult. The root cellar may not have to be as big as you might think. A lot of produce can be stored in a small space. For example, a room measuring 5 feet by 8 feet can hold 30 bushels of produce.

Reference: Bubel, M. and N. Bubel. "Root Cellaring: Natural Cold Storage of Fruits & Vegetables."