

The Posi-Igloo System

Introduction

Posi-Igloo is a lightweight insulated tent which can be used to store and cool up to 100 tonnes of potatoes and vegetables when used with a suitable refrigeration system. The tent is designed to be hung within a larger conventional building. It has been specifically designed for controlled temperature storage of seed potatoes although it is equally suitable for short term storage of any fruit or vegetable crop.

The storage of seed potatoes - the benefits of chitting

The benefits of controlled sprouting depend on the potato variety but can result in a yield increase of up to 20% (Sputna). Alternatively, the crop can be harvested up to three weeks earlier.

Sprouting has been traditionally controlled using a combination of light and temperature. However, where refrigeration is available, mini-chitting or physiological ageing can now be successfully achieved without the use of light. Each tuber is stimulated to give sprouts of equal length to ensure that the emergence and the best harvest time will be the same for all plants.

The development of a bulk system for mini-chitting potatoes in one tonne boxes has overcome the organisational difficulties of using lit trays and has allowed growers to gain the benefits from chitted seed.

The Posi-Igloo System

The concept of Posi-Igloo is to allow the grower to utilise an existing building for chitting potatoes by providing a controlled environment insulated tent in which the crop can be stored. In this way the cost of insulating and adapting an existing building is dispensed

with. Also the temporary nature of the tent allows it to be removed quickly after use so that the building can be used for other purposes.

How the Posi-Igloo is put together

The tent comprises five sections of insulating material (a top and four sides) and an aluminium frame from which they are hung. The top is fitted with flaps to overlap onto the sides and is attached to the sides with 100mm wide Velcro. The sides are held to the frame using clips and are joined together at the corners with full length zips. One long side is divided into three panels with similar zips to allow easy access to the boxes. The igloo material is a composite of plastic air bubble insulation and reflective foil (2L2) stitched to a durable nylon fabric.

The insulated tent is hung from a lightweight 50mm diameter aluminium tube frame. The frame is in turn hung from the ceiling of the building by two sets of support wires which allow the tent to be hoisted in position using two winches. The tent panels are attached to the frame whilst still at ground level before the whole unit is raised to the required height using the hand operated winches. The whole structure is extremely light and can be hoisted into place by just two operatives.

Cooling

Cooling is provided by a single phase packaged refrigeration unit which is fitted at floor level at one end of the tent. Air is circulated through the boxes using 'Posi-vent' fans and ducts. These comprise propeller fans which blow air through flexible plastic ducts.



The ducts have slots cut along their length which join onto the gaps between the boxes. Using this system temperatures within the tent are kept to within 1°C of target.

Loading and unloading the Posi-Igloo

Loading the Posi-Igloo is very simple as the construction allows one of the sides to be lifted completely over the tent. This means that boxes can be positioned easily with a fork lift truck. Unloading is equally as simple. The side of the tent is unzipped and lifted clear. As the boxes do not in any way support the tent, partial unloading is straightforward.

After use

After the Posi-Igloo has been used it can either be dismantled completely, or more practically, the sides of the tent can be laid on the top of the frame and the frame hoisted into the eaves of the building. This latter option can be done in less than half an hour. It also means that the Posi-Igloo can be brought back into use just as quickly.

Other uses of the Posi-Igloo

The Posi-Igloo can be used for a variety of other crop storage and treatment purposes. For potatoes, fumigation and crop warming can be carried out. The ability to put up the Posi-Igloo quickly makes it ideal for short season soft fruit and summer

vegetables where it can be used for quick cooling and holding of the crop prior to despatch.

Conclusion

Three years of tests at the Scottish Agricultural College's Centre for Rural Building in

Aberdeen have refined the design and proved it to be robust, practical and economic. The Posi-Igloo has proved to be an effective method of holding potato temperatures to below 4°C, thus controlling sprout growth. Its attributes are:

- Lower cost compared to conventional chitting buildings.
- Refrigeration to keep potatoes cool until planting, however late in the Spring it is.
- Efficient power usage due to the reduced volume of air space around the potatoes.
- Positive ventilation of potatoes to keep the crop cool and dry.
- Insulation around the boxes to reduce heat in-flow and therefore running costs.
- Allows potatoes to be chitted whilst being stored in standard one tonne boxes to minimise space used and to reduce handling.
- Flexibility; the system can be used for a variety of different crops and is easily packed away after use.