Harvesting and Packing Vegetables

Harvesting

The harvesting phase of vegetable production is crucial to the financial success of the operation. Negligence in the operation can quickly change top quality produce into worthless culls or animal feed. The machinery used for harvesting tends to be specific to each crop. To detail every unit available is beyond the scope of this publication. However, an attempt will be made to touch on some of the principles used in mechanically harvesting a crop.

Most of the leafy vegetable crops grown in Atlantic Canada are still harvested by hand, and require considerable development to assist in mechanization of harvesting. The initial step into mechanization of this type of operation is the consideration of harvesting aids that allow the picker to place the product on a conveyor system which delivers it to a point in the system for centralized packing. For certain types of vegetables, "wings" on the machine will allow the pickers to sit or lie down so that a more comfortable position can be attained

The harvesting of brussels sprouts has been semi automated. A machine will cut the sprout stem off and transport it to a stripper. However, it must be manually fed into the stripper head where the sprouts are removed.

The mechanization that exists in vegetable production to date is predominantly in root crops such as carrots, rutabaga. Here, deleafing/topping and harvesting have been, or can be mechanized. For example: a sugar beet topper, equipped with rubber flails, makes a good topper for rutabagas. A single row potato harvester equipped with flighted conveyors will work well in rutabagas.

The primary machine used for carrot harvesting has been the F.M.C. or "Scot viner". The crop is loosened by a lifter which goes under the crop, and is picked up by belts which grab the tops and deliver the carrots to the "topping bars" which squeeze together to separate the carrot from the top.

One serious impediment to any type of harvester which uses the top of a plant to lift it is frost. If frost kills the top, then some other method of lifting the crop must be used. This can be a spade or finger wheel device.

If root crops are to be stored in bulk, every effort must be made to remove all foreign material from the crop as it goes into storage. Green or leafy material that gets into the storage can and usually do start pockets of deterioration of the stored crop. Dirt and leaf removal equipment is essential.

Washing and Packing

Root washers are used extensively in Atlantic Canada as an important piece of post-harvest equipment for vegetable crops, both fresh and processing. Barrel type washers are the most common type, which uses the principle of agitation of the crop, which is immersed or partly immersed in water. Wire mesh, stain less steel or wood-slat barrels are partly immersed in a tank of water. The roots are tumbled repeatedly by the rotation of the barrel. The roots pass slowly through the barrel by a combination of barrel slope, angled flights, and pressure from fresh roots being fed in, and are removed on a slatted conveyor. At this point, a final water

rinse is incorporated from overhead sprays. Each vegetable crop has specific needs, so for further information on washing, you should consult your vegetable specialist and/or extension machinery engineer in your province.

Size graders are an important facet of vegetable preparation in many pack houses. Sized conveyor chains, oscillating screen graders, diverging roller graders and weight graders are four methods whereby the crop can be divided into as many sizes as desired, or is economical. Again, each crop is specific in its equipment needs.

In smaller packhouses, trimming tables and conveyors are extensively used. In the larger packhouses, automatic or semi-automatic packaging equipment is necessary. Mainly poly bags, paper bags and netted packs are produced. In the future more overwrapping equipment will probably be used for specific vegetable crops.

Efficient and economic vegetable production depends on the use of an appropriate balance of equipment, especially in the harvesting, washing and packaging of vegetable crops. Growers should consult with their vegetable specialist and machinery engineer for their recommendations. Usually, travel to other production areas to tour working vegetable operations is required before investments are made in new equipment.

Bibliography

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