



AGRONOMIC SPOTLIGHT



SWEET CORN HARVEST: QUALITY AND SAFETY

- » Sweet corn is highly perishable and requires prompt cooling after harvest for maximum quality and marketable shelf-life.
- » Harvesting is done by hand or with mechanical harvesting equipment, which can pose many potential dangers to workers.
- » Attention to food safety and sanitation is important throughout the growing season, and especially during harvest and post-harvest handling procedures.

MAINTAINING QUALITY AT HARVEST

Sweet corn quality is dependent on sugar content and volatile flavor compounds. The sugars in the kernels will begin to convert to starch after the ear is harvested or after the milk stage (R3) if left on the plant, which will reduce the sweetness and tenderness of the product. The higher the temperature, the more rapidly this process occurs. To avoid losses in quality, it is critical to cool the sweet corn as promptly as possible after harvest and to maintain the cold temperature through to market. For maximum quality, sweet corn should be cooled to around 32° F within an hour after harvest. Under optimal harvest and post-harvest conditions, the maximum shelf-life of sweet corn is only about 5 to 7 days. The longer the sweet corn remains at above optimal temperatures, the shorter the marketable shelf-life. Some producers choose to harvest in the cooler early morning hours or at night to avoid the heat of the day.

Other factors that can affect the quality of sweet corn include insect and disease damage and damage from hail, drought, or other environmental conditions. After harvest, plowing and destroying crop debris as soon as possible can help to avoid pest overwintering and breeding sites.

Sweet corn is ready for harvest when the silks are dried and turning brown, but before the outer leaves of the husk lose their green color and start to shed. The ears should feel firm, and the kernels should have a milky or creamy appearance when squeezed. Harvesting too late will result in reduced quality.

Hand Harvest

In some states, the majority of sweet corn is harvested by hand because this method allows for better selection of marketable ears. Sorting for quality in the field also decreases the time required for culling in the packinghouse, which means the product can move to the cooling step more quickly. Harvested ears can be placed on conveyors in the field to be transported to a packing facility, or packed directly in the field on harvest aids for an even quicker and more efficient packing process.

Mechanical Harvest

Sweet corn is mechanically harvested by self-propelled or



Figure 1. Sweet corn ready for harvest.

tractor-pulled harvesters. With mechanical harvest, the part of the stalk that contains the ears is cut by the harvester, and the ears are subsequently removed either by the harvest machinery or by hand. Culling and packing occur later in the packinghouse.

Culling Criteria

When assessing the marketability of sweet corn, kernel rows should appear uniform and individual kernels should look full and plump with a high percent milk. The shuck should adequately cover the entire ear with no separated leaves. Ears should be inspected for live insects, damage from insects and diseases, and defects such as discoloration, decay, and handling injury. The shank should be trimmed short at or immediately after harvest to reduce moisture loss, and flag leaves may be trimmed for visual appeal.

HARVEST EQUIPMENT SAFETY

Harvesting equipment can pose many potential dangers to the operator and others in close proximity. Weather conditions can pose potential dangers to all personnel involved in harvest. Listed below are tips for promoting safety at harvest.

Proper Clothing

- Wear high-visibility, close-fitting clothing to reduce the chance of being caught or pulled in by moving machinery.
- Workers who are hand-harvesting should wear long sleeves and long pants for protection from the abrasive leaves, insect bites, and sunburn.

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- Secure loose hair and do not wear jewelry as these can be grabbed by moving parts.
- Wear hard shoes or boots with slip-resistant treads; steel-toed boots are recommended.

Equipment Maintenance

- Thoroughly inspect and test farm equipment before use.
- Lubricate and maintain harvesting equipment on a regular basis.
- Refer to the owner's manuals when maintenance or repairs are necessary.
- After maintenance has been completed, ensure all guards are in place prior to operating the equipment.

Field Safety

- If a problem with mechanical equipment is encountered in the field, terminate all power sources, and ensure the machinery is in park or neutral with the parking brake engaged before working on it.
- Wait a few minutes after turning off farm equipment to make sure all parts have completely stopped moving before working on it.
- Keep hands out of pinch points. Numerous farmers have lost their hands while trying to free jammed chains, belts, etc.
- Never attempt to pull a stalk free from an operating harvester, you cannot let go of a stalk in time if the machine clears itself.
- Be careful of accessories that can be raised and lowered to ensure they don't drop unexpectedly while being serviced or transported.
- As with any field operation, stay hydrated to maintain awareness and take breaks to limit fatigue.

FOOD SAFETY AND SANITATION

General precautions to avoid contamination with potential sources of human pathogens should be practiced throughout the growing season. Good sanitation practices are just as important during harvest, packing, and shipping. Below are some guidelines that can help reduce the potential for contamination.

Maintaining Food Safety during Harvest

- When hand-harvesting, field workers should not harvest or handle culls to prevent the spread of infectious agents. Culls should be left in the field and removed by a separate work crew.

- Follow all OSHA regulations on requirements for toilets and hand cleaning stations in the field.
- Clean and sanitize all field equipment such as harvesting aids, picking containers, knives, brushes, buckets, etc. and avoid placing tools in direct contact with the soil. Plastic containers are better to use than wood because they are easier to clean and sanitize.
- All workers should wear rubber or latex gloves and sanitize them often at chlorine sanitizing dip stations.
- Sick workers should wear protective gear that shields the product from exposure, or they should not be allowed to touch fresh produce.
- Keep containers to be used for packing and shipping clean and separated from dirty ones. Don't allow them to touch the ground or any unsanitary surface where they can become contaminated.

Maintaining Sanitation Post-Harvest

- Water used for cooling purposes should be potable and continuously treated with a sanitizer such as chlorine to prevent the introduction of pathogens.
- Cold-storage facilities should be cleaned and sanitized on a regular basis. Even in cool conditions, the human pathogen *Listeria monocytogenes* can survive and multiply when moisture is present. Condensation and drips from refrigeration units should be minimized.
- Transport vehicles such as refrigerated trailers should also be inspected, cleaned and sanitized regularly.

Sources:

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Rains, G.C. and Sumner, P.E. 2012. Corn production safety and health for farmers. Bulletin 1333. University of Georgia Extension. <http://extension.uga.edu>.

Web sources verified 7/8/15.

For additional agronomic information, please contact your local seed representative.

Performance may vary from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields. The recommendations in this article are based upon information obtained from the cited sources and should be used as a quick reference for information about sweet corn production. The content of this article should not be substituted for the professional opinion of a producer, grower, agronomist, pathologist and similar professional dealing with this specific crop.

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