Walnuts: Harvesting and Processing

Walnut trees (*Junglans regia*) can be grown in many places around the world, such as India, South America, Moldova and the USA. Although, there are some variations in how walnuts are harvested depending on the country of origin, the general process is the same. The following information is largely based on the USA processing procedures. However, the main differences in methods used in other countries is the use of manual labour opposed to the use of machines, ie: manual cracking, hulling, etc.

Walnut orchards typically follow one of two designs or layouts. One possible method is to allow for more spacing between walnut tree rows, allowing the trees to grow to their full canopy capacity. The other commonly used layout is to plant the rows a bit closer together in order to fit more total trees and produce a bigger immediate yield. For both methods, each row of tree has a mix of different complimenting tree varieties to ensure proper pollination and allow for the walnuts to grow. Common varieties are chandler, hartley and franquette.

The walnuts are **harvested** in the fall between the months of September and November when the green outer hulls are starting to dry and split. Harvesting is done either manually or mechanically with a machine (a small vehicle with an arm to grip the trunk) that shakes the tree causing the nut pods to fall to the ground. If the nuts remain on the ground for a prolonged time, they can become susceptible to infestation or rot. During this time, it is important to remove mummy nuts (unharvested nuts) and damaged nuts to lessen the likelihood of damage from the navel orangeworm. This is one of the most common pests for the nuts. Damage from the orangeworm can go unseen as it causes internal damage, making it more difficult to spot. The risk of this damage is highest when the husks begin to split open and while the nuts are on the ground. Walnut blight and walnut blotch are also potential diseases for this nut. These are more common in crop years that have experienced prolonged rain fall during blooming season, but is something to bear in mind. Due to the potential pest damage or diseases, the key to a successful crop is to practice good orchard sanitation. Once the walnuts have dropped to the ground, the walnuts are swept into rows in between the trees and collected from the orchard floor quite quickly in order to reduce the chances of pest damage. They are then transported to the processing plant.

Upon **reception** at the plant, the pods are given a water bath before continuing on to be processed. This is an initial cleaning stage to remove any branches, leaves, or extra dirt that may have been collected with the walnut pods.

After harvesting and reception, the nuts are **processed**. This starts with a de-hulling to reveal the inshell walnut. This can be done mechanically or by hand. Once this is complete the nuts are left to **dry**, most commonly done in large containers that are air dried, until the moisture reaches a level of about 5-8%. As some factories use wooden drying racks with metal nails, this can be a point of foreign body contamination and should be considered a point of extra care. This is an importance processing step as it helps to maintain the quality of the nut and avoid deterioration during storage time. Walnuts can be processed both inshell or shelled. If the nut is going to remain in shell, the shells are cleaned and prepared for packaging. These nuts are commonly used for oils. Otherwise, the nuts continue on through further processing. After the walnuts have been dried they are **shelled**. This is typically done mechanically. Shelling mechanically can increase the risk of damage to the kernels, but this is very slight. Shelling can also be done by hand with a hammer/mallet which can be better for the kernel, but requires more time and man power.

The walnuts are **sorted** throughout processing into three classes (extra, I, II). This is decided by size and colour (extra light to amber). Examples of defects that are looked for and sorted out during processing are mould/rot, shell fragments and insect damage. Defects that are allowed some tolerance are dark kernels, mould/rot and scuffs. For specific definitions of defects possible with walnuts, a good reference is the UNECE standards (although these can vary by supplier or country of origin):

http://www.unece.org/fileadmin/DAM/trade/agr/standard/dry/Standards/DDP02_WalnutKernels_e.pdf

During processing the nuts will be inspected for foreign bodies (ie adhering shells, metal from drying racks, etc.). This is done visually. Depending on the factory, this will also be done using instruments such a sieves, metal detectors and laser sorters.

The walnut kernels, having passed through multiple grading and classing processes, are finally **packed**. It is suggested that the walnuts are kept in air tight bags to reduce the risk of oxidisation and maintain freshness through shipping and storage.

References:

- http://fruitandnuteducation.ucdavis.edu/education/fruitnutproduction/Walnut/WalnutHarvestingProcessing/
- http://www.walnuts.org/about-walnuts/how-walnuts-are-grown/
- UNECE Standards
- http://ext100.wsu.edu/benton-franklin/wp-content/uploads/sites/22/2013/12/Disease-Problems-in-Walnuts.pdf