

Parboiling

Parboiling freshly sliced sweetpotato chips for 5 minutes or more and then sun-drying them, reduces the infestation and development of insects on the dried chips. Alternatively fresh sweetpotato roots can be boiled for 30-60 minutes prior to peeling, slicing and sun-drying. It is likely that the hardness of the par/boiled chips helps protect them from insect damage.

Salting

Salting of sweetpotato chips prior to drying has also been found to negatively effect storage pest development and infestation of the dried chips. Salt can be applied at an application rate of 20-30g of salt per kg of freshly sliced sweetpotato chips.

Sun-drying

Farmer's practices of regularly inspecting their dried sweetpotato products and re-drying them in the sun if pests are observed can effectively reduce pest populations and damage. If the products are placed in the sun in a thin layer on a mat or sheet of plastic for several hours the heat of the sun can destroy the developing eggs, larvae and pupae. The additional use of a piece of clear plastic over the top of the drying product has been found to increase the effectiveness of this technique when used on cowpeas. However, the need for the product to be left out for several hours means that someone needs to guard it from livestock, unless it can be placed on a flat roof or platform out of harms way.

Re-drying

Dried sweetpotato products are often re-dried at regular intervals during the storage season, this can help reduce the moisture content and enables the farmer to check for infestation.

Rolling and shaking

Disturbance has an adverse effect on larval survival of some of the insect pest species, and so the rolling or shaking of sweet potato chips periodically may be effective in reducing adult emergence and damage. However, it is also likely to break some of the chips into smaller pieces. In some areas, cowpeas are placed inside children's pillowcases in the belief that the disturbance will reduce insect survival.

Traditional protectants

Traditional protectants such as ash or plant materials could also be used to repel, reduce the feeding damage or kill storage insect pests. However large quantities of these materials often have to added to the stored product to protect it and then these same materials need to be removed from the product before consumption and this can be quite laborious. Some plant materials might be toxic to human and care should be taken in selecting which ones to use.

Insect proof containers





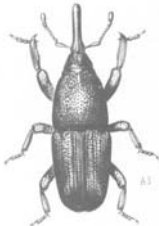


The use of insect proof containers such as clay pots with sealed tops can be very effective in preventing insect damage during storage as long as the product is not infested prior to being placed in the container.

Storage duration

The duration that the dried sweetpotato is to be stored for will affect the control methods used, most storage insect pests take about a month to complete their lifecycle from egg to adult. If the product is only being stored for a few months, pest damage is unlikely to be high unless there was a very high level of infestation at the start of the storage season which might occur if the product is placed in an infested container or environment, or next to other infested products. However, the larger grain borer *Prostephanus truncatus* causes high levels of damage very rapidly and control measures need to be taken immediately if this pest is found.

Varietal differences

There appear to be differences in susceptibility to storage insect damage between varieties. If farmers are aware that some varieties are more susceptible to insect damage during storage than others the susceptible varieties should be consumed first if possible.

	Scientific name, common name, and average size	Stored products it commonly damages
	<i>Prostephanus truncatus</i> (larger grain borer - LGB) 3-4.5 mm long	Sweetpotato, cassava, maize, wood.
	<i>Araecerus fasciculatus</i> (coffee bean weevil) 3-5 mm long	Sweetpotato, coffee, cacao, nutmeg, maize, yam, cassava, legumes, groundnuts, nuts
	<i>Rhyzopertha dominica</i> (lesser grain borer) 2-3 mm long	Sweetpotato, cassava, sorghum, wheat, paddy rice, processed cereal flours
	<i>Dinoderus minutus</i> 2.5-3.5 mm long	Sweetpotato, cassava, bamboo, wood, maize, cacao.
	<i>Sitophilus zeamais</i> (maize weevil) 2.5-4.5 mm long	Sweetpotato, cassava, maize, milled rice, sorghum, wheat, solid processed cereal products e.g. pasta,
	<i>Tribolium castaneum</i> (red flour beetle) 2.3-4.4 mm long	Sweetpotato, cassava, maize, wheat, sorghum, groundnuts, nuts, spices, coffee, cacao, processed cereal flours, dried fruit
	<i>Lasioderma serricorne</i> (cigarette or tobacco beetle) 2-2.5 mm long	Sweetpotato, cassava, tobacco, maize, pulses, spices, fruit, processed flour and some animal products

Hygiene

Larvae of some of the insect pests can also survive in the sweetpotato flour. If sweetpotato flour is left around in the storage environment it may act as an important source of carry over populations between seasons. The main sources of infestation are attributed to residual populations from old stock, unclean storage containers and alternate hosts. Many of the storage pests feed on other dried products as well as sweetpotato. This can often lead to cross infestation of stored products and attention must be paid to hygiene of all stored products. Further details on good storage hygiene practices are given in section 5.5.1.

5.5.4 Management of pests and disease in fresh sweetpotato storage

Fresh sweetpotato roots have been stored in good condition in pit or clamp stores for 3-4 months during the dry season (see 5.3). It is very important that only roots with absolutely no evidence of damage from wounding during harvest, transport or insect pests are selected for fresh storage in order to reduce losses due to rotting or insect damage during storage. However, even though only clean undamaged roots have been selected and handled very carefully during the loading of the store, it is still important that the stores are inspected regularly (every 3-4 weeks) in order to check for root rotting, rodent and insect damage. If any of these problems are found, the whole store should be cleared and the affected roots discarded. It is not advisable to re-store unaffected roots from the same store as they might harbour diseases, they should be sold or used quickly to avoid further losses. If during inspection the roots are still in good condition the pit or clamp store should be resealed carefully and the shade roof replaced. It is important to regularly check the soundness of the roof structure and make any necessary repairs. As snakes are occasionally found inside the stores care must be taken during inspections.

The stores can be used the following season, although any old grass or soil should be removed, and as an added precaution a fire can be lit inside the pit store to help sterilise it. New dry grass and fresh soil should be used for lining and covering the stores. If problems with rotting were encountered, it might be worth trying to build the store in a drier position the next season or altering the depth/height/size that you build it, and digging a drainage ditch around it. If insect or rodent problems were encountered, you could try selecting the fresh roots for storage more carefully, covering the store with a thicker layer of soil, or cleaning the surrounding area of debris. Some varieties of sweetpotato store better than others, it might be worth trying fresh storage of a different sweetpotato variety or a range of varieties in the next season.