

CIS 1104

# Managing Foreign Material for Quality Idaho Potatoes

Nora Olsen and Brad Geary



## Introduction

Consumer satisfaction is the ultimate goal in the production, storage, processing, and packing of potatoes. The commitment to growing high quality potatoes requires that only the best, and safest, products be delivered to the consumer. Minimizing foreign material in the field, storage facilities, and packing or processing plants will help maintain high potato quality, consumer safety, and consumer confidence. Whether the potatoes are destined for the fresh market or processing, foreign material in potatoes is a great concern to the entire potato industry.

Foreign material in potatoes includes anything that is not the actual potato tuber. Foreign material can be physical or chemical in nature (Table 1). Much of this material comes from the field or the activities of people, but foreign material can also come from equipment, storage facilities, or handling. This bulletin outlines management practices for reducing the presence of foreign material throughout the potato production and handling system.

An on-farm program that identifies areas where foreign material may mix with potatoes is a good place to start. Once these areas are identified, methods to reduce foreign material can be implemented. A checklist may also prove helpful to systematically evaluate trouble spots in your production system.

## Pre-Season

Field selection is important for producing a quality potato crop. If a known part of a field was used as an old dumpsite, homestead, barn, or corral, then flag and avoid planting in that area. These types of areas can be a major source of old glass, metal, and wood. If you are planning to purchase or lease a field for growing potatoes, gather information on the history of the field. Useful information can be obtained by questioning neighbors, checking court documents, or looking at old aerial photographs obtained from the Natural Resource Conservation Service. Investigate the locations of old dumpsites, homesteads, and cement ditches or irrigation canals.

Fields next to urban establishments should be considered risky for planting potatoes because neighbors may inadvertently leave trash that can then blow onto cropped fields. If a field in an urban area is going to be planted to potatoes, visit with neigh-

**Table 1.** Examples of common foreign material found in potatoes.

Glass	Bones	Aluminum
Wire	Wood	Golf balls
Corn residue	Tools	Shot gun shells
Light bulbs	Metal	Irrigation equipment
Rocks/Pebbles	Plastic	Manure

S  
53  
E322  
No. 1104



bors or post the field, asking people to not leave trash or other foreign material that could enter the field.

Golfing and hunting are popular activities in Idaho, but both of these activities can be a source of foreign material in potatoes. Golf balls are a particularly difficult problem in potato fields near urban areas. A golf ball can do a great deal of damage if it goes undetected into the cutting knives of a processing plant. Shotgun shells or rifle casings can also cause serious problems in processing plants. Inform hunters that they must pick up all hunting materials.

Prior to planting, pick up litter in and alongside the field so that these materials do not get incorporated into the soil during field preparation and planting. Inform employees to pick up any trash that may be uncovered while planting and encourage them to throw away their own trash. Providing plenty of trash bags or cans in trucks, tractors, and seed cutting areas will facilitate the proper disposal of trash.

## Planting and Growing

Equipment breakdowns are unavoidable. If planters or irrigation systems need repairs in the field, use repair techniques that reduce the chances of introducing foreign material into the field. Tools and small pieces of equipment are common foreign materials that enter processing or packing plants. Place a tarp under or around equipment when repairing breakdowns. The tarp will collect nuts and bolts or equipment debris that may drop off. Tools are often left on the ground or on equipment, so each tool needs to be accounted for when the repairs are finished. This mindset is important to all aspects of your farming operation.

Employees are an important part of any farming or plant operation. Employees also serve as the first line of defense against foreign material. Whether your workers are in a potato field or a field that will be rotated to potatoes, such as sugarbeets, instruct irrigators, weeders, and scouts to pick up trash when they see it. Arm them with garbage sacks that easily fit on their belts. Educate employees on the potential safety concerns and economic impacts of improperly disposing of garbage and foreign material.

Debris from previous crops can be considered foreign material in potatoes. For instance, when potatoes are grown after corn, corn cobs and corn crowns are common debris entering processing plants. Modifying rotations or varying tillage practices may reduce the amount of debris left over from the rotational crop. Specialized equipment, such as sand machines, blowers on harvesters, or air knives at transloading/storage facilities, may also help reduce some of the debris.

## Storage

Before harvest, the storage facility needs to be prepared and cleaned of foreign material. There are numerous places within the storage where foreign material may be present, and there are even areas of the storage facility that may actually generate foreign material.

### *Inside the storage*

If it is necessary to work on equipment in storage, such as a piler, it is important that you use good clean-up practices. Simply placing a tarp underneath the equipment or area where you are working will catch fallen materials and help account for all tools. A trashcan near the repair site will also make clean up easier.

Evaluate the integrity of the storage by inspecting for any loose insulation or wood. Look for areas in the wall panels where screws may have come loose or have fallen to the floor. Keep ongoing notes on potential problem areas in order to return and make repairs. Duct tape and old tubers often remain on the duct pipes from the previous storage season. Clean the pipes of all foreign material and be sure to remove all old duct tape. Trash, debris, and old tubers can collect while potatoes are being removed from storage. An easy way to remove this material is to rake it into piles and load it into a wheelbarrow or trashcan. After cleaning and picking up all visible foreign material, perform another thorough inspection of the storage to make sure items were not missed.

After the storage building has been inspected and cleaned of all visible material, the next step is to pass a magnet over the floor. The magnet will collect any iron-containing metal materials that were missed during the cleaning process. Small metal fragments, such as wire or paper clips, are hard to see on the dirt floor, but the magnet will easily pick these up. A smaller magnet can be used for the corners and along the edges of the walls of the building to pick up metal that the larger magnet cannot reach. Lastly, check to see if all equipment and storage lights have shatterproof coverings.

### *Outside the storage*

The area outside the storage facility also needs to be cleaned. Any trash that has accumulated outside the doors of the storage must be picked up and removed. Trashcans need to be well marked and easily accessible. It is especially important to clean off the concrete pad or area directly in front of the storage doors. Trash, rocks, and any other foreign material could easily move into the storage if this area is not kept clean.

Rodents and birds are considered foreign material mixed in with potatoes. Storages are great places

University of Idaho



0 0206 00825147 5



53  
E322  
W0.1109

for rodents to hide, so set traps around your storage facility. If you place traps inside, use spring-loaded styles. Do not use bait traps inside the storage. Bait traps can be used around the outside of the storage, but they need to be checked frequently to ensure that plenty of bait is available. Birds also find potato storages to be an attractive environment. Chicken wire or netting over the air intake doors and exhaust louvers can help prevent birds from entering the storage.

Trucks used for hauling potatoes need to be inspected for loose insulation, worn and shredded belts, and other parts that may break off and mix with potatoes. All truck beds should be thoroughly cleaned each year, especially if the trucks have been hauling materials other than potatoes.

## **Harvest**

Harvest is always a hectic time in the potato industry but it is also an important time to ensure that foreign material from the field does not get into storage, fresh pack, or processing facilities. Before the harvester enters the field, pick up any garbage in the field and pay special attention to field borders adjacent to roads. Blowers on the harvester will help keep lighter materials, such as plant debris, corn-cobs, and aluminum cans, out of your harvested potatoes.

### *Employees*

If your harvest operation employs people on the harvester, provide instructions on the safe removal of any foreign material including bottles, cans, and plastic. It is important to have accessible and clearly marked garbage and rock buckets on the harvester so that material collected will not find its way back into the field.

Transloading and loading operations are good opportunities to watch for foreign material. These processes often require many employees, so several trashcans need to be available. The cans should be clearly marked and emptied periodically so they are not overflowing. It is important to take time to educate your employees on the importance of throwing away their garbage in the appropriate place. Ask employees to not bring food or drinks in glass containers to work.

Employees should be instructed to pull out and throw away any foreign material seen on the conveyors. Be sure to explain your priorities for handling foreign material.

### *Equipment*

Several types of equipment can help reduce the potential for foreign material to enter storage facilities. Blowers and air knives associated with potato conveyers can be used to separate lighter debris.

Sand machines are also useful, since heavier materials such as rocks will not be carried with the sand and potatoes. A beneficial, but extreme, measure is to wash potatoes immediately before delivery to the processing plant to eliminate many types of foreign material including rocks, soil, debris, and cans. Clodhoppers are useful for separating rocks and clods, but this type of equipment is not particularly good at removing other types of foreign material.

All equipment should be in working order with no hydraulic fluid leaks or loose bolts. This is not only important for reducing foreign material, but also for increasing the efficiency of your harvest operation. Garbage sacks should be available in the cabs of all tractors and trucks so that trash does not accidentally make its way into the potatoes or fields.

## **Potato Packing or Processing**

Foreign material can be very costly once the potatoes are at the packing shed or processing plant. Employees in both fresh packing sheds and processing plants should receive training on the importance of eliminating foreign material. Employees need to be instructed to keep a keen eye out for golf balls, bones, horseshoes, or anything else that can filter in with the potatoes. Potatoes dropped on the floor should be thrown away, and not placed back onto the potato packing line. This is also important for other types of trash, especially bag closers, which need to be properly deposited in trashcans. Readily accessible and well-marked trashcans will make this process easier for employees.

## **Overview**

Employee education is a major part of a successful program for eliminating foreign material in potatoes. Whether the employees are scouting, harvesting, sorting, or working on equipment, they all can play an important role in removing foreign material from fresh and processed potato products. Friendly reminders and accessible garbage containers wherever employees are working will make it easier to throw away trash and foreign material. Training employees about the importance of eliminating foreign material is a necessity for every potato operation.

A commitment to utilize all available methods to eliminate foreign material in potatoes all season long will only strengthen the reputation of quality potatoes for Idaho fresh and processed potato products. From field selection to packaging, programs to reduce foreign material need to be in place. Checklists are often helpful to systematically cover all points of your operation. A sample checklist is provided on the next page.



## Example of an on-farm checklist to reduce foreign material in potatoes

### *Prior to planting*

---

1. Flag and avoid areas known to be an old homestead, corral, or dumpsite.
2. Inform people not to hit golf balls onto fields that may ever be used for potato production.
3. Inform hunters to pick up all hunting materials (e.g. shotgun shells).
4. Clean up litter in and along fields before planting.

### *Planting and Growing*

---

1. Instruct employees in potato and rotational fields to pick up trash.
2. When repairing equipment, use tarps and good clean-up practices.
3. Clean up litter in and along fields before harvest.

### *Storage*

---

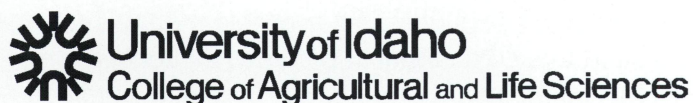
1. Inspect the storage facilities for any needed repairs (e.g. loose insulation or metal, broken wood, missing screws).
2. Clean the storage of unwanted material (e.g. metal, wood, duct tape).
3. Remove duct tape from duct pipes.
4. Pass magnets along the floor to pick up hidden metal pieces.
5. Use a smaller magnet for corners and edges.
6. Ensure light fixtures have shatterproof covers.
7. Make trashcans available for employees both inside and outside.
8. Clean concrete pad or area in front of storage facilities.
9. Trap rodents.
10. Use netting or chicken wire over air intake doors and exhaust louvers for bird control.

### *Harvest*

---

1. Properly maintain all equipment (e.g. avoid loose bolts or metal, fluid leaks).
2. Provide visible trashcans in areas where employees eat lunch or use restrooms.
3. Empty trashcans often.
4. Utilize rock cribs and garbage buckets on harvesters.
5. Post and explain instructions for employees on priorities for picking out foreign materials and throwing away their own trash.
6. Put garbage bags in all trucks and tractors.
7. Inspect all trucks for loose insulation, belts, and other parts.

**About the authors:** Nora Olsen is an Extension Potato Specialist and Brad Geary is an Extension Potato/Onion Specialist, both with the University of Idaho.



We would like to acknowledge the Idaho Potato Commission for their contribution to this project.



Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Charlotte V. Eberlein, Interim Director of Cooperative Extension, University of Idaho, Moscow, Idaho 84844. The University of Idaho provides equal opportunity in education and employment on the basis of race, color, religion, national origin, age, gender, disability, or status as a Vietnam-era veteran, as required by state and federal laws.