Food Safety Considerations for Field Crops Contaminated by Fire Ash

Summarized by Purdue Extension, based on Cooperative Extension Service Fact Sheets published by University of California, Oregon State University, and University of Maine.

Field crops such as corn and soybeans may be impacted by ash and residue from a wildfire, structure, or industrial fire. However, food safety issues are likely to be limited, even though there may be potential hazards.

Potential food/feed safety effects from ash

- **Industrial fire ash** is the biggest concern, because it can contain heavy metals (lead, arsenic, cadmium), dioxins, or other persistent compounds. These can adhere to plant surfaces or in rare cases move into tissues.
- **Agricultural or vegetation fires** mostly leave mineral ash (K, P, Ca) that is less concerning from a food-safety standpoint, though it can still irritate animals/humans if ingested in quantity.
- **Livestock feed risk:** Forage and silage exposed to ash should be evaluated before feeding — primarily to avoid contaminants, and also because ash can reduce palatability and digestibility.

Husks and pods protect grains

- **Field corn kernels are well protected** by husks until harvest; unless husks were burned or heavily infiltrated, ash generally does not penetrate to the kernel.
- **Soybeans are enclosed in pods** that likewise act as a physical barrier. As long as pods remain intact, the beans themselves are unlikely to have direct ash deposition.
- **Visible ash** on the *outside* of the plant is different from **systemic uptake**. The chance of systemic uptake is usually low unless there was direct foliar absorption of soluble compounds during active growth. If grain crops are near or at maturity at the time of the incident, systemic uptake very unlikely.

Harvesting operations reduce contaminant levels

- **Much ash and surface residue is expelled** during mechanical harvest and cleaning. Combines naturally shake, blow, and separate plant material. The husks, leaves, and pods that catch most of the ash are carried away with the chaff.
- **Grain handling** adds additional cleaning steps (screens, air, augers) that remove fines and light debris. That means most external ash deposits never make it into the stored grain.

- ***Heavy, sticky ash deposition*** (especially with industrial oils or particulates) on plant surfaces could still remain and warrant extra cleaning or testing.

Other Considerations

- **Food-grade crops** such as white corn used for tortillas is routinely subject to additional testing during the harvest and processing operations to ensure food safety.
- When crops from a fire-affected area are marketed, they will be **blended** with non-impacted grains from other locations. This blending will further dilute the contamination (if any exists).
- Many grain crops, especially corn, are used for **industrial purposes** such as ethanol, and never directly enter the human or animal food chain. Even if a grain crop is found to have residues above threshold levels for human or animal use, it likely can be marketed for ethanol or other industrial use.
- **Processing further reduces risk.** Milling, cooking, ethanol fermentation, or oil extraction all reduce surface ash contaminants, though they won't remove systemic uptake if it occurred (again, uptake is usually minimal).

Sources

- University of California Agriculture and Natural Resources. Wildfire Ash: Impact on Forage Crops. Accessed at https://ucanr.edu/sites/default/files/2020-09/334187.pdf
- Oregon State University. Food Safety and Wildfires. Accessed at https://agsci.oregonstate.edu/wrcefs/article/food-safety-and-wildfires.
- University of Maine Cooperative Extension. Using Wood Ash on Your Farm, Bulletin #2279.