

# Farming after the Flood

## Flood Impacts

Flooded soils create significant challenges for agricultural lands. The floods have many direct impacts, the most prominent being:

- **Deposition of sand and debris** on productive lands;
- **Erosion** of agricultural soils; and
- **Flooded soil syndrome**—loss of beneficial fungi which mobilize soil-based plant nutrients.

As a result of these effects after floods, farmers are challenged by yield losses and devastation of arable land. Subsequently, producers need to plan for the slow recovery of their arable soils.

## Post-Flooding Soil Management

Deposition of sediment and other debris on otherwise productive land requires post-flooding management to:

- Remove sediment and debris barriers to crop production;
- Repair the physical damage to the soil;
- Stimulate soil microbial activity; and
- Limit indirect impacts like soil crusting.

Experts in the science and management of soils have identified methods to revitalize soil health so farmers can repair their soils and return land to a productive state. Agricultural consultants and university extension staff provide information about these methods and assistance in implementing the steps to recovery. However, not all fields can be reclaimed and losses are often significant.

## Recovery Plans

Producers face a number of legal, economic, and physical challenges when developing their recovery plan.

### Removing barriers to crop production

To adequately address debris and sedimentation in fields, farmers must first determine if the material and objects can be tilled into the soil, or if physical removal is required. Physical removal is costly because of the volume of the material and the distance of transport. Regulations prevent sediments from being placed into the river.

### Repairing the physical damage to soil

Erosion occurs when soil is carried away with the flood water. Gullies and gaps in the field will form as a result of the loss of soil. Some erosion can be corrected with tillage. However, more often, the gullies are filled with sediment and then topsoil from another area in the field. If the cost of repair is too high, the farmer may be forced to abandon the field. Land easement programs offered by the USDA Natural Resources Conservation Service may offer options to reclaim some of the lost capital.

### Stimulating soil microbial and fungal activity

Arbuscular mycorrhizae (AM) are symbiotic fungi that grow on and in plant roots. The fungi penetrate roots without harming them. As a result, the fungi receive food—carbohydrates—from the plant and the plant will receive nutrients—primarily phosphorus—from the fungi. Since no plants grow in these fields during prolonged flood events, the fungi are lost from the system. In order to re-establish the population of fungi, producers can plant cover crops. A “cover crop” provides good ground cover to protect the soil from erosion and can range from legumes (beans) to small grains. Cover crops add organic matter to soil while also stimulating microbial and fungal activity.

Fields covered with sediment and debris



Eroded Field



Nutrient Deficiency from Flooding



Soil Crusting



## Cover Crops



## Economic Impacts of Flooding in Nebraska and Iowa

According to a study conducted by Decision Innovation Solutions of Urbandale, Iowa for the Nebraska and Iowa Farm Bureaus, the flood's impact on six Iowa southwestern counties was \$207 million. In Nebraska, crop losses alone—not including damage to infrastructure, future soil productivity, and business operations—totaled \$188.8 million. After crop insurance and disaster payments, the estimated losses were \$41.1 million for the 14 counties affected in Nebraska.

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***“Overall soil health, including soil texture, structure, water holding capacity, and nutrient availability, must be restored to allow for agricultural productivity after flooding.”***

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## Crop Insurance Programs

The Federal crop insurance program provides coverage for 254 million acres in the United States, with more than half devoted to corn and soybeans. The Risk Management Agency administers the program under the guidance of the Federal Crop Insurance Corporation. Program responsibilities include regulating, reinsuring, and overseeing all aspects of the program, including standards for claims payments, rate setting, and crop insurance policy revisions. The program is a partnership between the Federal government and 15 private insurance companies. Many of the affected producers in the Missouri and Mississippi River basins have crop insurance.

## Presenters

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John Wilson is an Extension Educator based in Burt County, Nebraska. John co-leads a team of extension staff from Iowa State University and the University of Nebraska-Lincoln to reclaim agricultural land devastated by the 2011 Missouri River Flood.

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Scott Olson and his wife, Susan, with his brother, Randy, and father, Robert, farm over 3,000 acres of corn and soybean in Burt County, Nebraska. Scott is also Vice President of Lee Valley Inc., a farm machinery implement dealership, and part owner of Lee Valley Auction and Realty. Since May 28, Scott has documented the 2011 Missouri River Flood with over 3,000 aerial photographs. You can find more photos of the flood at [www.leevalley.net](http://www.leevalley.net).

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James Callan is a consultant with a specialty in crop insurance, the Farm Bill, crop protection and technology, and budget-appropriations issues. He served six years in USDA, from 2003 to 2009, including as Chief of External Affairs, Associate Administrator, and Acting Administrator of the Risk Management Agency, which administers the multi-billion dollar Federal crop insurance program.

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American Society  
of Agronomy



Gully erosion through field.