

COMMUNITY ENGAGEMENT AND EDUCATION

Freeze Drying Crops for Increased Climate Change Resilience in New Mexico



Crop yields are threatened by extreme precipitation events, such as hail storms that damage crops or floods that destroy entire fields. While some damage caused by climatic factors is only aesthetic, the imperfections render crops unsalable. As a result, farmers lose money and time, while local markets' quantity of nutritious foods decreases. In response, Backyard Farms, a farm with multiple sites throughout southern New Mexico, freeze dries the crops of local farmers to decrease the food lost to extreme weather. Freeze-dried crops retain nutritional content for up to 25 years without refrigeration. Now, farmers can sell crops that would have otherwise been lost, and local rural communities gain increased access to nutritious foods for longer periods of time.



Project Location

USDA Southwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE



A Local Farmer's Heirloom Melons Ready to Freeze Dry

KEY ISSUES ADDRESSED

Heat and drought stress, flooding, and damage from storms stunt crop growth, reduce yields, and kill entire harvests. For example, early-season heat and drought can reduce the number of corn kernels per row. After extreme weather damages crops, farmers are unable to make money off of their hard work, and resources and nutritious foods are lost from the food supply chain. Crops lost at the farm contribute to the 30% of the country's food supply that is thrown away. Rotting food emits methane and pollutes freshwater. Growing drought-tolerant crops native to New Mexico, such as nopales, can reduce food waste; however, there is not high commercial demand for such crops. Preventing the loss of nutritious foods from the supply chain is important in New Mexico, where 20% of children and 14% of adults face hunger or must travel long distances to transport perishable foods.

PROJECT GOALS

- Provide freeze-drying services to farmers to allow them to sell crops they would have otherwise lost
- Incentivize farmers to grow drought-tolerant crops
- Reduce food waste in New Mexico
- Increase the local community's access to nutritious foods year-round, with a heightened focus on low-income and rural populations

GROUND-UP AGRICULTURE

Backyard Farms partners with Cruces Creatives which makes regenerative practices feasible through producer knowledge-sharing and support services.



Industrial Freeze Dryer

PROJECT HIGHLIGHTS

Freeze-Drying Method: Freeze-drying equipment chills crops to subfreezing temperatures, then removes the ice crystals without heat, preserving vitamins and minerals. For up to 25 years, freeze-dried crops can be placed in water to retake their original form, but without aesthetic defects.

Incentivizing Drought-Tolerant Crops: By buying nopales, a culturally important cactus native to the region, Backyard Farms incentivizes local farmers to grow drought-tolerant crops. Nopales require minimal irrigation, are adapted to New Mexico's monsoonal rains, and are disease resistant. Nopales pads and resulting chips come in a variety of flavors, have high nutritional content, and help stabilize blood sugar.

Prioritizing the People: Backyard Farms prioritizes providing freeze-dried crops to local people at risk of food insecurity due to limited access to grocery stores. For example, Backyard Farms provides freeze-dried fruits to local daycares, senior centers, Tribal centers, food banks, food pantries, and schools across the state.

Meals for Disaster Relief: Backyard Farms freeze dries meals to support those displaced by natural disasters. In collaboration with the El Calvario United Methodist Church, they provide staple New Mexican comfort foods, including posole, tamales, and enchiladas.

Collaborators

- Backyard Farms
- See online for full list of collaborators

CART Author: Jackelyn Alessi, Drought Learning Network (DLN), February 2024.

Photos courtesy of Backyard Farms.

For more information on CART or DLN, contact Karlee Jewell (karlee_jewell@fws.gov) or Maude Dinan (mdinan@nmsu.edu).

Visit CART:



LESSONS LEARNED

Backyard Farms discovered that nopales chips are high in demand by grocery stores, including larger grocery chains. To meet that demand, Backyard Farms will require more cold-storage capacity, a larger supply from farmers, and more trucks to transport crops from local farmers to Backyard Farms facility in Las Cruces, NM.

At-home freeze dryers are available to the public, but more advanced equipment and funding will be necessary for those interested in freeze drying large quantities of food. Backyard Farms purchased industrial freeze-drying equipment with the Rural Business Development Grant with grant partner Cruces Creatives. The industrial freeze dryer can process 350 pounds of fresh produce per load, while extra large commercial freeze dryers can only process 35 pounds per load.

Because farmers are used to a market in which they break even or lose profits on damaged crops, they undervalue crops sold to Backyard Farms. Backyard Farms offers more money for crops than farmers often think they are worth, demonstrating how the continual loss of profits has discouraged farmers from asserting the true value of their crops.

NEXT STEPS

- Continue to work with the New Mexico Grown Program and the Regional Farm to Food Bank Program to provide freeze dried complete meals to at risk populations
- Increase storage capacity and supply to freeze-dried, ready-made meals for larger disaster relief programs
- Increase storage capacity and supply to sell nopales chips to larger grocery chain stores

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Freeze Dried Apples