



AgAID
Institute

National Agricultural AI Institute
for Transforming Workforce
& Decision Support

Artificial Intelligence for Specialty Crop Agriculture

USDA National Institute of Food and Agriculture
UNITED STATES DEPARTMENT OF AGRICULTURE



SUBSCRIBE
TO OUR NEWSLETTER
www.agaid.org



WHO WE ARE

We build and foster human-AI partnerships to sustain specialty-crop agriculture and help feed our growing population. We bring together top researchers from diverse disciplines to empower agriculture professionals with trailblazing AI-tools to assist decision making. Our research can transform the way AI systems are designed and built to solve complex societal problems.

AgAID INNOVATIONS & IMPACTS

- Simulating orchard environments to train robot workers
- Optimizing water allocation using deep temporal models
- Developing streamlined human-AI workflows
- Advancing robot sensing and control
- Improving streamflow forecasting models
- Designing Inclusive user interfaces

HOW WE HELP

We work with specialty crops that demand long term management, use a lot of water, and are vulnerable to the impacts of extreme weather. We harness the combined power of human and artificial intelligence in three key areas:



Water Intelligence

fallow prediction | streamflow forecasting | water use modelling



Farm Operations Intelligence

irrigation management | frost mitigation | heat-stress management



Labor Intelligence

farm robotics | improved workflows | human-AI interaction



Our **Farm Intelligence Thrust** is developing tools to support decision-making at the farm scale, helping farmers manage the impacts of extreme weather and other uncertainties.



Heat Stress

Improved heat-stress prediction models to manage crop loss and improve the quality of farm produce



Frost Mitigation

improving machine learning models for cold-hardiness prediction for specialty crops | supporting grower decision making using AgWeatherNet



Deficit Irrigation

innovating neural networks to improve site-specific weather and soil-water content prediction



Our **Labor Intelligence Thrust** is developing innovative and inclusive human-AI workflows and improving the efficiency of farm robots and the productivity of farm workers.



Human-Robot Dormant Fruit Tree Pruning

Training machine learning models for pruning | simulating orchard environments | improving robot sensing and control



Human-Robot Fruit Tree Flower and Blossom Thinning

Improving flower-thinning decision making and workflows | developing deep learning models for flower detection



Nut Harvesting

Developing the next generation of nut harvesting machines | Cutting-edge AI control systems to optimize tree-nut shaking



Our **Water Intelligence Thrust** is designing AI solutions to assist better stewardship of water resources, and addressing water scarcity challenges.



Fallow Prediction

developing empirical and simulation-based models to predict fallowing of drought-affected irrigated cropland



Streamflow Prediction

improving overall streamflow prediction accuracy and uncertainty quantification using deep temporal AI models



Snow Water Equivalent Prediction

developing a machine learning model to reliably predict snowpack and snowmelt



Irrigation Infrastructure Mapping

Mapping the network of canals and waterways from remote sensing images through deep-learning