

# USDA Pecan Postharvest - Shelling

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## Motivation

- Optimizing the shelling process as it has a critical importance on the pecan harvesting process.
- Providing smarter and real-time fine-tuning of the shelling process.
- Improving overall efficiency and control of post harvesting operations.

## Research Objectives

- Determine relationship between sheller parameters and pecan half-yield.
- Determine impact of moisture on half-yield during shelling process.
- Determine effects of pecan variety on previous objectives.

## Design of Experiments

Independent Variables	Dependent Variables
Feed Rate (lbs./hr.)	Half Yield
Ring gap (in.)	Output Location
Paddle Shaft Velocity (RPM)	
Pin material	
Drum Velocity (RPM)	
Machine Tilt Angle ( $\theta$ )	
Pecan Moisture Level(%)	
Pecan Species	

## Equipment

14" Pecan Sheller from Modern Electronics and Equipment modified for research purposes:

- Transparent siding
- Segmented output locations
- Independent drum and paddle shaft motors
- Ability to change machine tilt angle



## Expected Outcomes

Our plan is to examine the effects on half yield when performing experiments with variations of multiple independent variables, and thus determine how to control half-yield with the manipulation of said variables.