CABBI
CENTER FOR ADVANCED BIOENERGY AND BIOPRODUCTS INNOVATION

# Exploring Feedstock Pathways to Three Billion Gallons of Sustainable Aviation Fuel: The Roles of Contracts and Bioenergy Crop Insurance

## Background/Objective

This study examines how contracts and bioenergy crop yield insurance incentivize biomass supply for three billion gallons of sustainable aviation fuel (SAF). High-yielding bioenergy crops, such as miscanthus and switchgrass, are promising feedstocks, but their commercial production has not yet commenced due to associated risks. Long-term contracts between farmers and biorefineries can offer effective mechanisms to manage risks and ensure stable feedstock supply.

## Approach

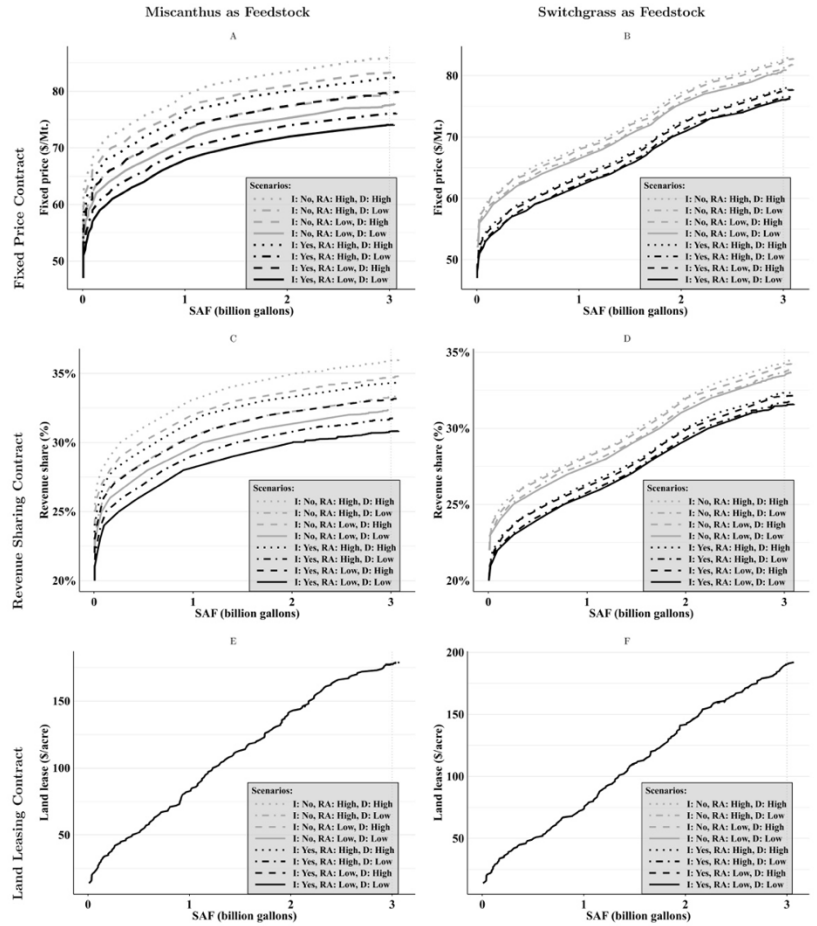
A conceptual framework was developed to model a farmer's decision-making problem of whether to switch from conventional crops to a bioenergy crop under three different types of contracts (fixed-price contract, revenue-sharing contract, and land-leasing contract) in the absence or presence of bioenergy crop insurance. Numerical simulations were conducted using county-level yield data for miscanthus, switchgrass, and conventional crops.

## Results

Results show that meeting feedstock demand by growing uninsured miscanthus requires a fixed biomass price at $78-$86/metric ton, a revenue share of 32%-36%, or a land-leasing payment about $178/acre, and growing uninsured switchgrass requires similar terms. Bioenergy crop insurance partially substitutes for compensation for bearing production risk, decreasing required fixed prices and revenue shares by 4% and 6% for miscanthus and switchgrass, respectively.

## Significance/Impacts

This study provides direct insights for developing feedstock pathways and supporting policies associated with SAF. The findings also support existing survey studies which show that bioenergy crop insurance can be an important incentivizing factor for farmers to adopt bioenergy crops.




**Contract terms required to induce sufficient biomass feedstock for a specific quantity of SAF production**

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