BRC Science Highlight
October 2019

Adopting Bioenergy Crops: Does Farmers' Attitude Toward Loss Matter?

Background/objective

Farmers are considered loss averse if a dollar of income loss means more to them than a dollar of income gain. We examined the effect of farmers' aversion to loss of income on their economic incentives to convert land from traditional row crops to miscanthus or switchgrass.

Approach

We simulated yields for miscanthus, switchgrass, corn, and soybeans in the rain-fed region of the U.S. by using the DayCent model under 27 different weather conditions to examine the returns from producing different crops and the risk of loss/gain in income relative to a reference scenario in which the farmer only plants corn and soybeans or keeps land under pasture.

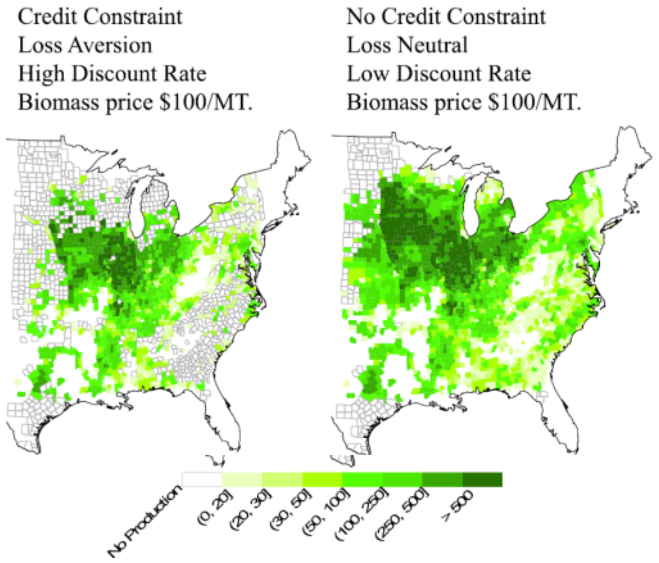
Results

- Loss aversion affects acreage and spatial pattern of economically viable energy crop production, particularly when farmers are credit-constrained and have a high discount rate (see figure).
- It also reduces incentives to grow miscanthus due to high upfront establishment costs and greater risk of loss of income.
- Conversely, loss aversion increases incentives to grow switchgrass, particularly in Northern Plains and Upper Midwest

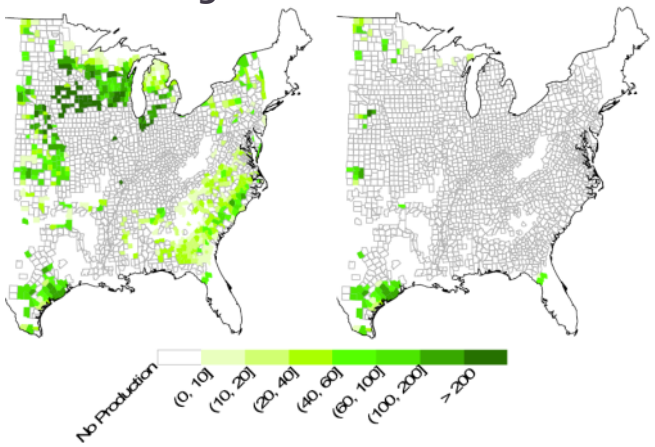
Significance

- Policymakers should target biomass production to low-quality land where farmers are less sensitive to losses.
- With loss averse farmers, an establishment cost share subsidy would be more effective than annual payments to induce more miscanthus production.

Miscanthus Production



Switchgrass Production



Anand, M., et al. 2019 . "Adopting Bioenergy Crops: Does Farmers' Attitude Toward Loss Matter?" ***Agricultural Economics****, 50 (4), 435-450. doi: 10.1111/agec.12501*

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