

Resilience Emerging
from Scarcity and Abundance



2016 MEETING
Nov. 6-9 | Phoenix, AZ

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49-2 Living Mulch Establishment in Row Crop Systems for Sustainable Biofuels Production.

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Monday, November 7, 2016: 8:45 AM
Phoenix Convention Center North, Room 125 B

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Abstract:

With increasing removal of maize (*Zea mays* L.) stover for cellulosic biofuels or livestock bedding and feedstuffs, there exists a need to ensure natural resources-related issues such as soil erosion, nitrate leaching, and loss of organic matter content are appropriately managed. Perennial groundcover offers a tenable solution for alleviating these problems associated with maize stover removal from conventional cropping systems. We conducted a field study to ascertain the expected cost of perennial groundcover establishment on the primary crop of economic interest and groundcover success under a maize or soybean (*Glycine max* L.) crop. To test this concept, we established either Kentucky bluegrass (KB) (*Poa pratensis* L.) or creeping red fescue (CF) (*Festuca rubra* L.) as living mulch (LM) concurrently with either maize or soybean, documenting impacts on crop maturity, leaf area index (LAI), normalized difference vegetation index (NDVI), stand density, yield components, grain yield, and C and N. First-year maize and first- and second-year soybean in the no LM control yielded on average 13.00, 3.38, and 4.86 Mg ha⁻¹, respectively, 30, 84, and 27% greater than LM systems. However, yield did not statistically significantly differ in the second site year between the no LM and LM maize. Moreover, perennial groundcover treatments did not affect expected ethanol yield in the second year, averaging 5,459 l ha⁻¹ in year two over all treatments).

These results indicate that further research is needed to achieve groundcover establishment and subsequent natural resources benefits in row crop production while minimizing impact on yield.

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