Can Rice Production Be “Green”And Still Make Money?

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Data from a 10 year rotation study that contained a conventional-and no-tillage comparison will be presented for 5 rotations. There were no significant differences between tillage treatments over this 10 year period nor were there differences between fertility levels. Using no tillage was most effective in rotations that had rice every third year and least effective in continuous rice production. Rice grain yields were most impacted by rotation with highest yields in rotations where rice appeared every third year and lowest grain yields in continuous rice. Data on soil carbon (C) from this study show that increasing the frequency of rice in a rotation results in increased soil C while at the same time rice grain yields decreased. These trends can be mitigated by reducing the time a field is flooded (aerobic). To do this it will be necessary to produce rice with intermittent flooding. Data collected in 2011 indicate that this is possible without significant reductions in grain yield.

A description of factors controlling greenhouse gas emissions from rice fields will be presented with data collected in 2011 showing that nitrous oxide (N2O) emissions can be managed with proper nitrogen fertilizer management and the use of intermittent flooding holds potential to reducing methane (NH4) emissions. Data collected in 2011 indicate that methane production in rice fields begins approximately 10 days following flooding and peaks at about green ring. Flooding a field and allowing the field to dry can potentially brake this methane cycle and repeating the flooding and drying cycle could potentially eliminate much of the methane production during the growing season. This approach resulted in no differences in grain yield for two varieties in 2011 while significantly reducing the amount of water needed to grow the crop. From these data we believe that there is potential to manage decreasing nitrogen efficiency while reducing water use and greenhouse gas production in rice fields while maintaining or increasing profitability. Δ

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