**Bioenergy Feedstock Supply from Wheat Straw: A Farm Level Model with Multiple Market, Disease Risks and Soil Trade-offs**

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Second-generation (i.e. cellulosic) ethanol can be made from wheat straw, but the availability of wheat straw for ethanol production in Canada is uncertain. Farmers have the option to grow canola, which is susceptible to disease that affects yields, or wheat, whose straw could be sold to alternative markets (e.g. livestock bedding and feed) or biorefineries. We develop a dynamic programming model to investigate a farmer’s wheat straw supply decision in response to different wheat straw and crop prices. Our model considers crop choices between wheat and canola in the context of disease risk, and the trade-off between the immediate payoffs a farmer may receive from bailing and selling wheat straw, and the long-term adverse affects that removing wheat straw from the soil surface may have on wheat and canola yields. The results from this study illuminate conditions that could result in the supply of wheat straw to biorefineries, which impact the productivity of farmland.

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