CONSERVATION AGRICULTURE

OVERVIEW OF A HIGH-IMPACT DRAWDOWN SOLUTION

Conservation agriculture refers to a set of agricultural practices that supports biosequestration via crop rotation, managing soil organic matter, and reduced tillage.

TECHNOLOGY AND MARKET READINESS

Cover crops and reduced tillage practices are already widely used in the United States and Georgia. Natural Resources Conservation Services (NRCS) cost-share programs already established to incentivize their adoption.

LOCAL EXPERIENCE AND DATA AVAILABILITY

There is widespread adoption of reduced tillage and cover crops. Many empirical studies have been conducted analyzing the costs of these practices and the yield effects for a variety of crops.

TECHNICALLY ACHIEVABLE CO2 POTENTIAL

There is an issue of additivity here – namely, many farmers already use reduced tillage practices and cover crops. While many farmers use reduced tillage practices, they often alternate them with conventional tillage. According to Project Drawdown®, conservation agriculture practices increase the carbon sequestration rate at an average of 0.2 tons of C/ac/y. Georgia has about 3.8 million acre of croplands about 47% of the croplands are under conservation tillage practices. If another 40% of the land would be converted into conservation tillage, the CO2 sequestration potential could be about 1.1 Mt CO2-e per year.

COST COMPETITIVENESS

Cost depends on the types of crops and yield potentials. In the literature, there were limited data related to conservation tillage practices for specific crop types. The farm specific practiced conservation measures and the associated costs can be estimated by the procedures from Gordon (2013). In general, conservation agriculture practices save cost to farmers.

BEYOND CARBON ATTRIBUTES

This solution improves water quality and quantity, while also lowering soil erosion and improving soil health. Excess water runoff is minimized from better soil protection, reducing water use and the carrying of fertilizer contaminating water (Derpsh et al., 2010). Soil quality is improved though reducing the loss of organic material and improving/maintaining the original soil porosity, resulting in higher resistance to drought (Derpsh et al., 2010). Farmers may experience increases in crop/agricultural yield and thus increases in income and wages (Knowler & Bradshaw, 2007; Pretty et al, 2006). When plants have a better opportunity to healthily grow from the extension of water and plant nutrients, yields have been reported to increase anywhere between 20%-120% with lower energy and production costs (Derpsh et al., 2010). Water quality improvements can increase public health and raise the quality of life for farmers/rural communities, and upfront costs for farmers would be low if agricultural systems are already in place (Lal, 2015).

A negative impact of this solution is the difficulty in changing farmers' perceptions that conservation agriculture lowers yield and income. Interventions such as subsidies and interest groups continue to discourage farmers from adopting no-tillage practices, stagnating the preference for conservation agriculture (Derpsh et al., 2010).

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Endnotes:

1. https://agecon.uga.edu/extension/budgets.html
2. https://www.ers.usda.gov/amber-waves/2019/march/no-till-and-strip-till-are-widely-adopted-but-often-used-in-rotation-with-other-tillage-practices/;
3. https://www.ers.usda.gov/webdocs/publications/90201/eib-197.pdf?v=1783.8
4. https://gaswcc.georgia.gov/agricultural-conservation-programs
5. https://www.drawdown.org/solutions/food/conservation-agriculture

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