

Certification and GHG Calculations of Climate Smart Practices for Biofuels

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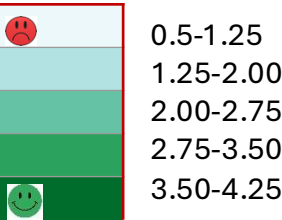
Presentation Overview

- GHG Reductions with Climate Smart Practices (CSA): Illinois Case Study
- Sustainability Certification of CSA and Monetization via Book&Claim protocols

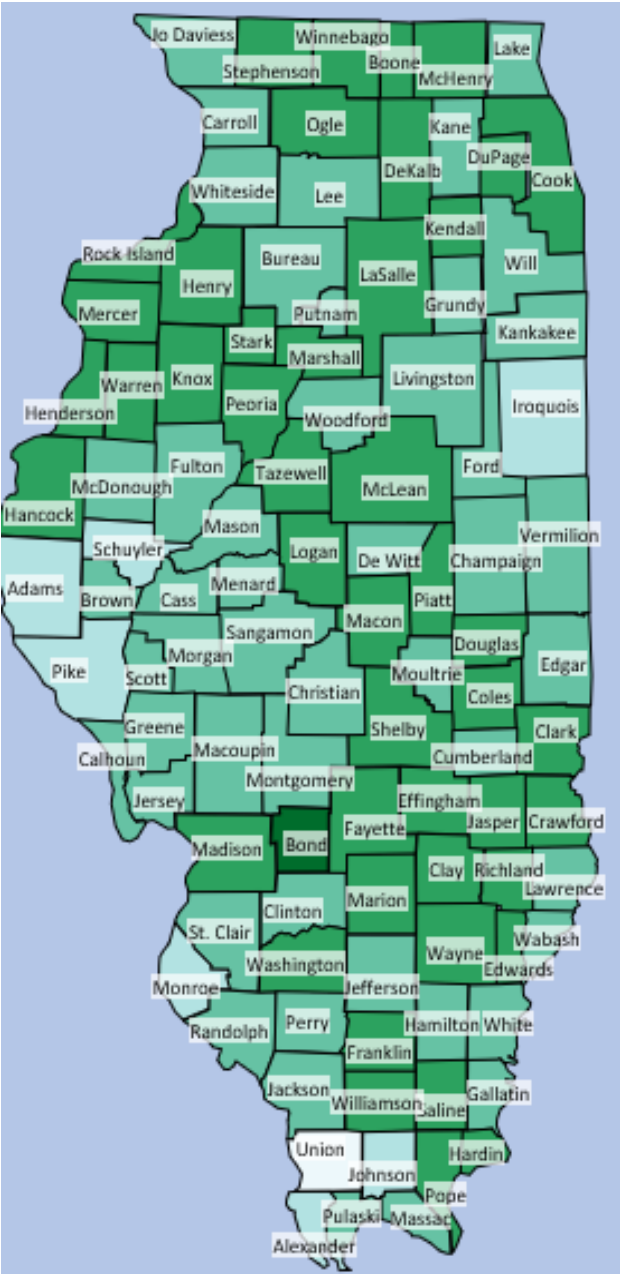
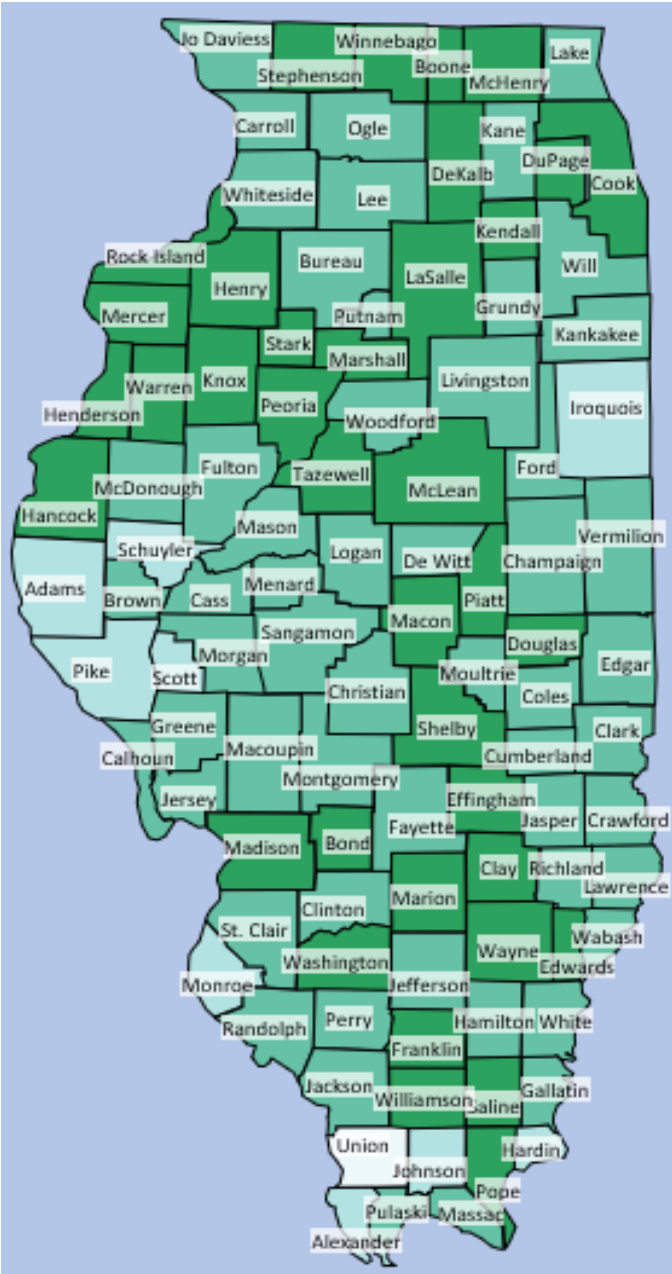
GHG Reductions with Climate Smart Practices (CSA): Illinois Case Study

Spatial Variation in 2000-2023 Yield Gain in Illinois –National average of 1.82 bu/ac/yr

2023 Yield
(bu/ac)

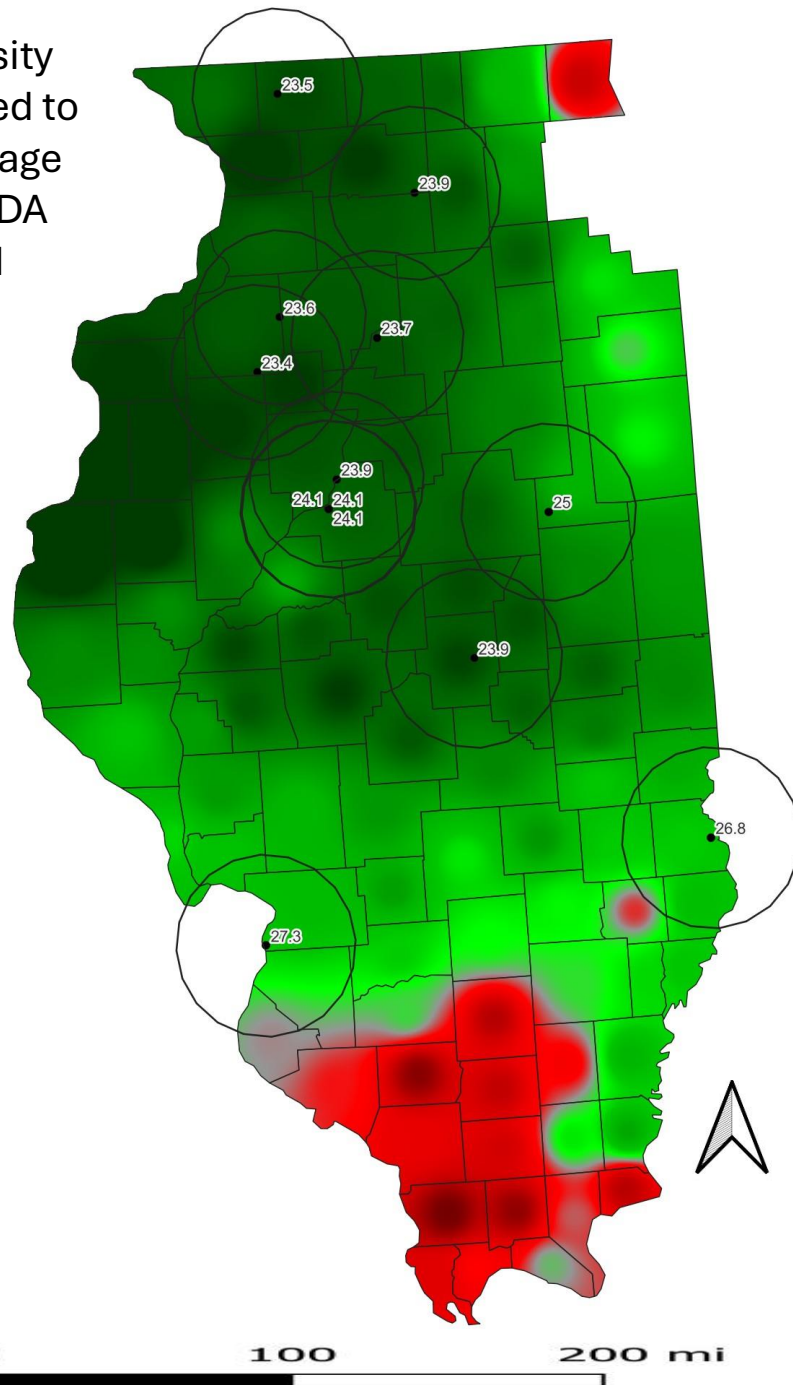


State Avg - NASS
Incl. 2012 - 2.57
bu/ac/yr
NASS Excl. 2012
– 2.64 bu/ac/yr



Carbon Intensity
Score Compared to
National Average
Based on USDA
NASS Yield
Data

G CO₂e/MJ of grain
production



IL County CI Score: Yield and N Inputs

- State Average CI score is 5% lower than national average.
- Average CI score within 35 miles of ethanol plants is 16% lower than national average.

*Based on NASS 2022 County level Yield Estimates

CI Assessment: Around Ethanol Plants

Differential Yield Increase and N fertilizer productivity in counties within a 35-mile radius of ethanol plants and those not within that radius from 2000-2022 for USDA-NASS and USDA-RMA data sources.

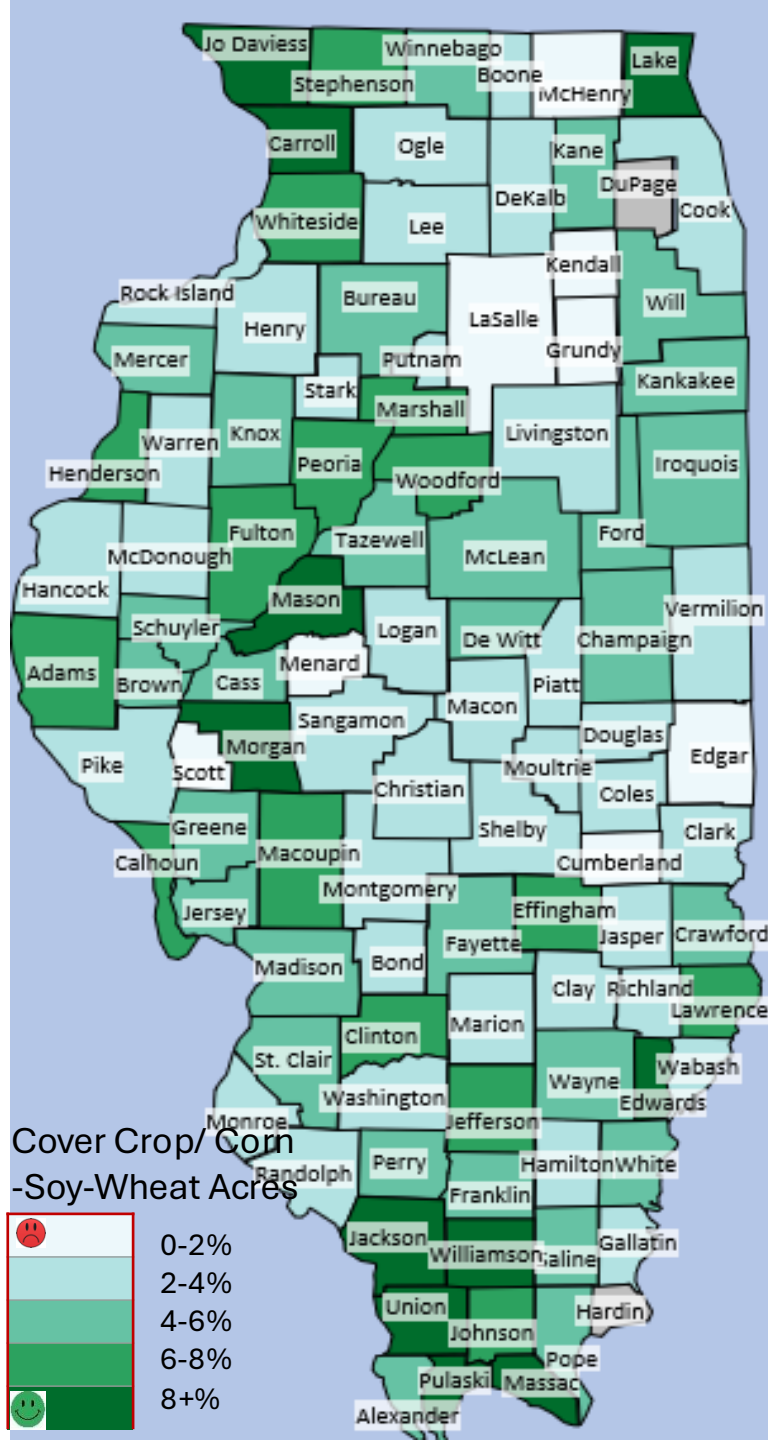
	Counties within 35 miles of Ethanol Plant	Counties NOT within 35 miles of Ethanol Plant	% Difference
Total Number of Counties	56	44	
Avg NASS Yield Increase (bu/ac/yr)	2.5	2.3	8.6%
Avg RMA Yield Increase (bu/ac/yr)	2.8	2.2	27.3%
Avg NASS Fertilizer Productivity (lb N/bu)	0.82	0.90	8.9%
Avg RMA Fertilizer Productivity (lb N/bu)	0.75	0.85	11.8%

Other CSA Practices

IL County Cover Crop %

State Average = 5%

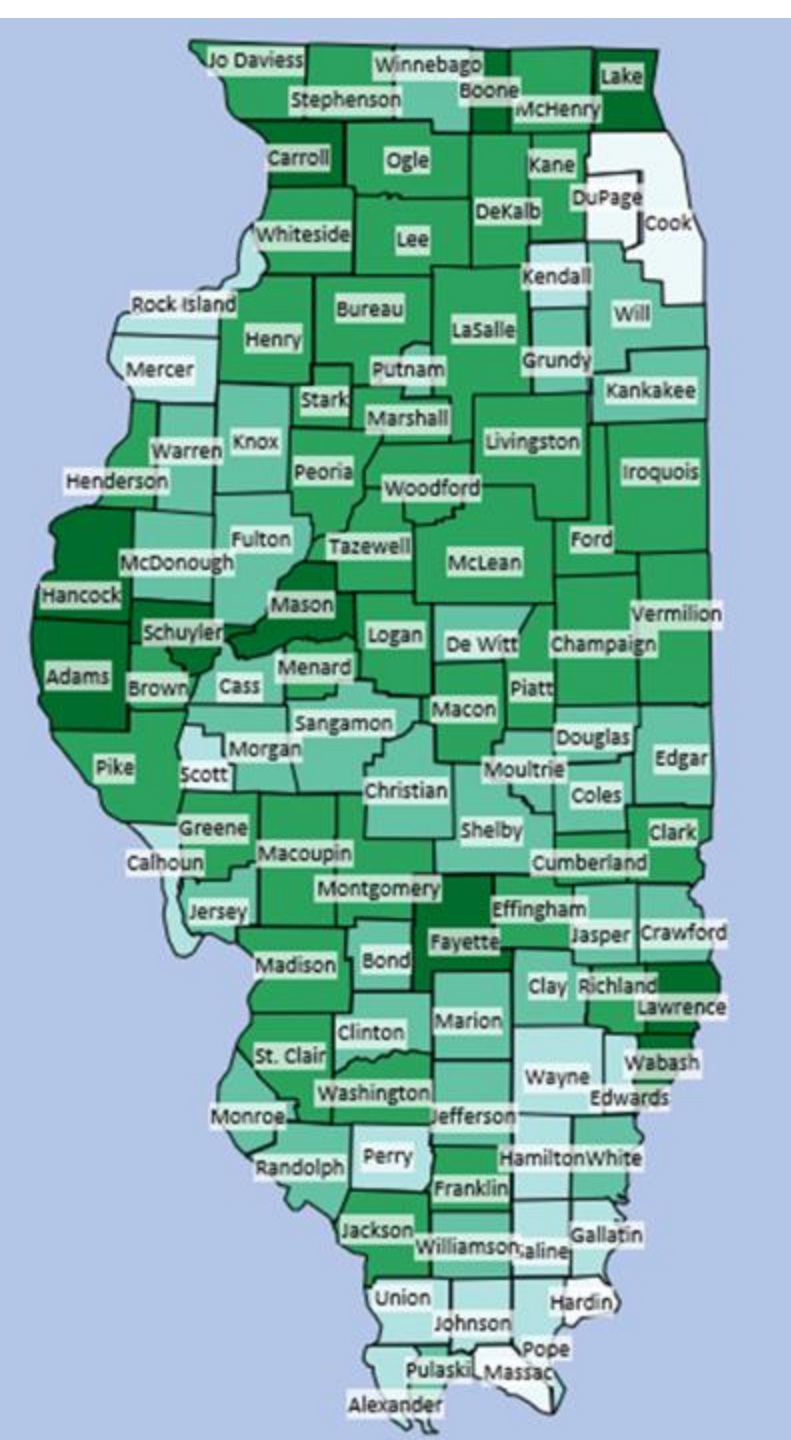
National Average = 8%



IL % of acres in reduced-till

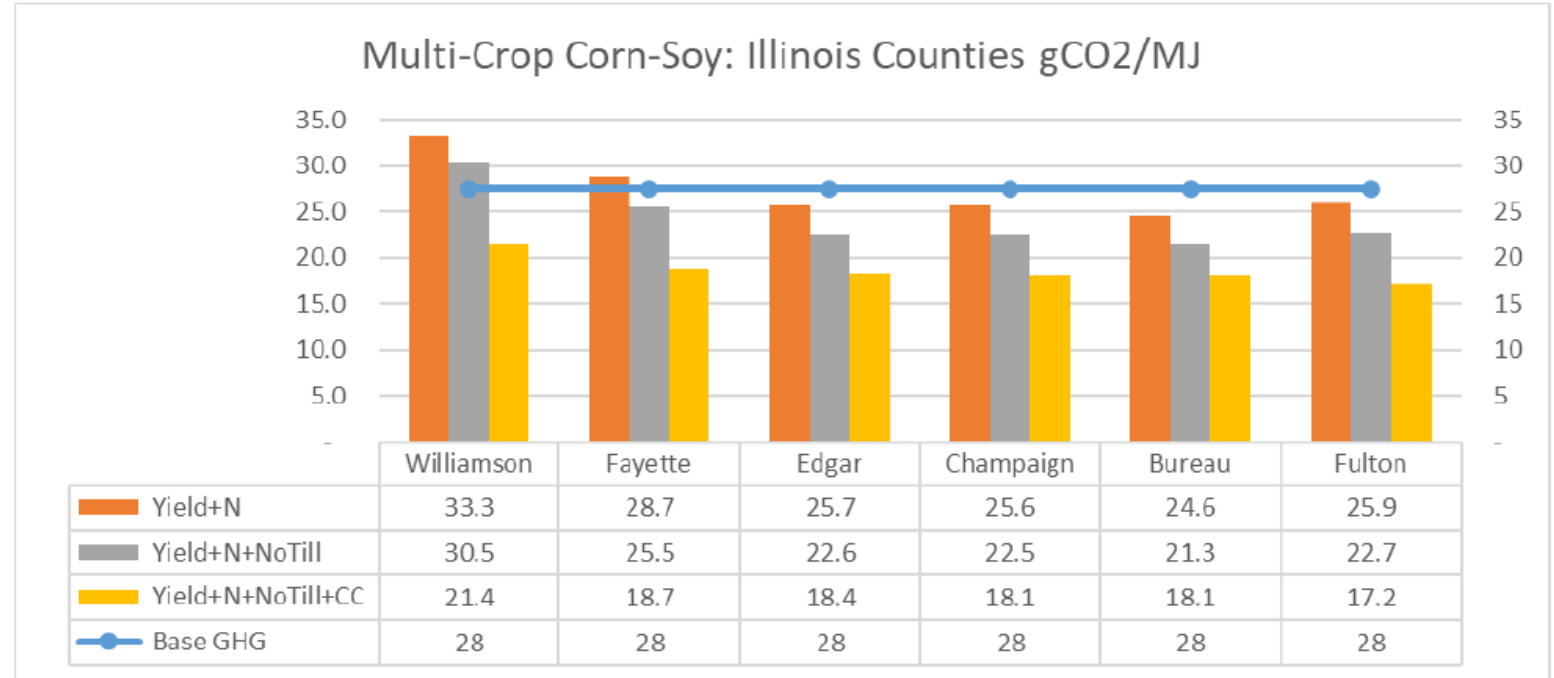
State Average = 37%

National Average = 35%



Spatial CI Assessment: Additional CSA Practices

- Carbon Intensity (g CO₂e/MJ) of corn production in a corn/soy rotation across 6 counties along a South-North transect in Illinois.
- Lower CI from Higher yields, better Nutrient Use Efficiency in North but Soil Carbon Models show larger CI Benefits from Cover Crop in South
- **Benefits from CSA depend on Geography but Opportunities in All Regions**



South

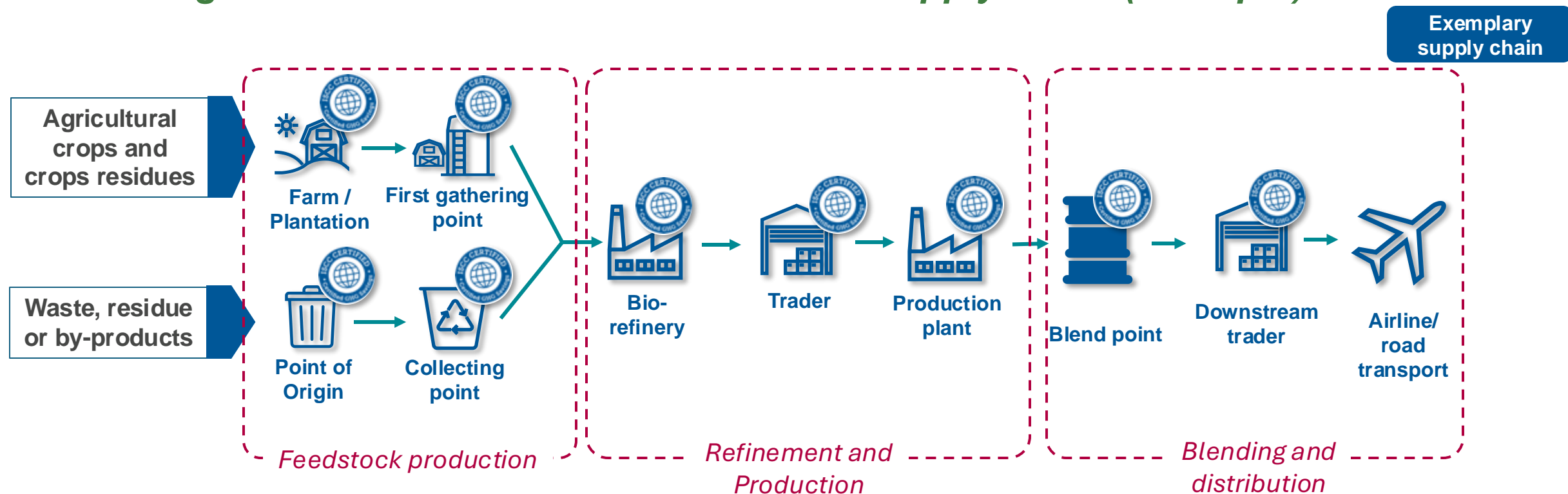
North



Sustainability Certification of CSA and Monetization via Book&Claim protocols

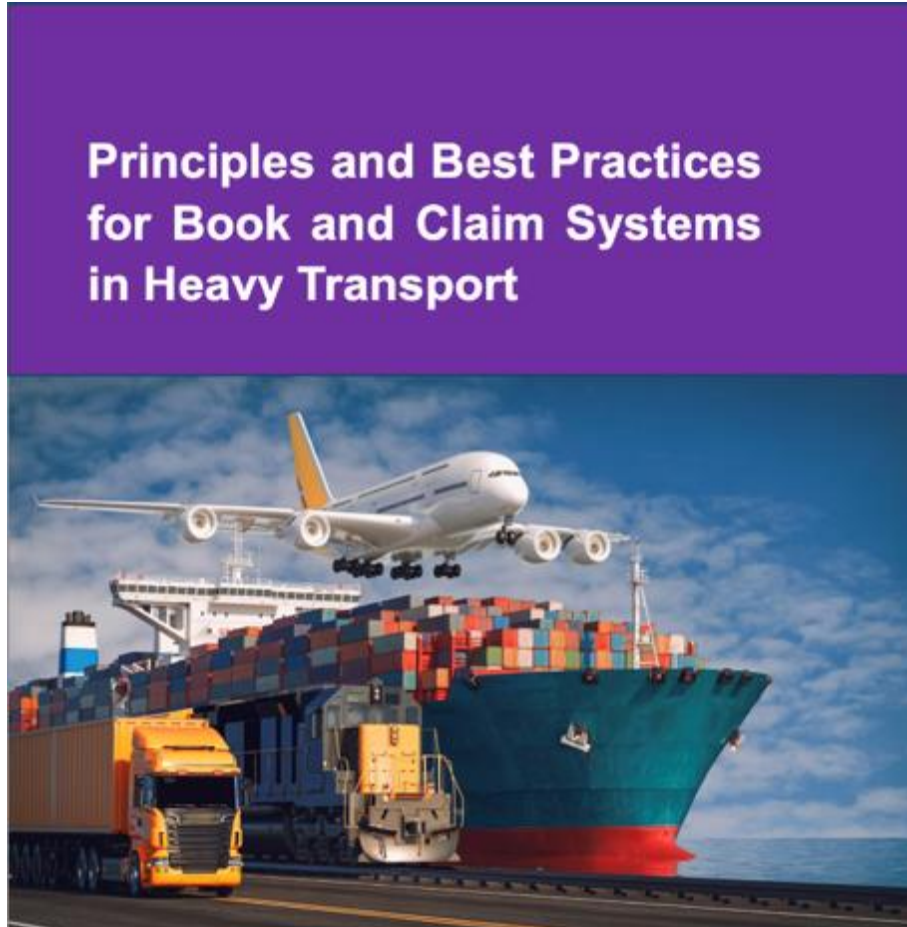
From Start to Finish: Certification Ensures Full Supply Chain Traceability

Visualizing the Path of Certification Across the Supply Chain (Example)



- Virtually all elements in alternative/renewable fuel supply chains can be covered and made “certifiable” by the supply chain scopes depicted above
- For each certification scope, clear and publicly available certification requirements have been defined – the compliance with which are checked during regular audits

Book and Claim Enables Participation of All Growers, Regions, and CSA Practices



Contributing

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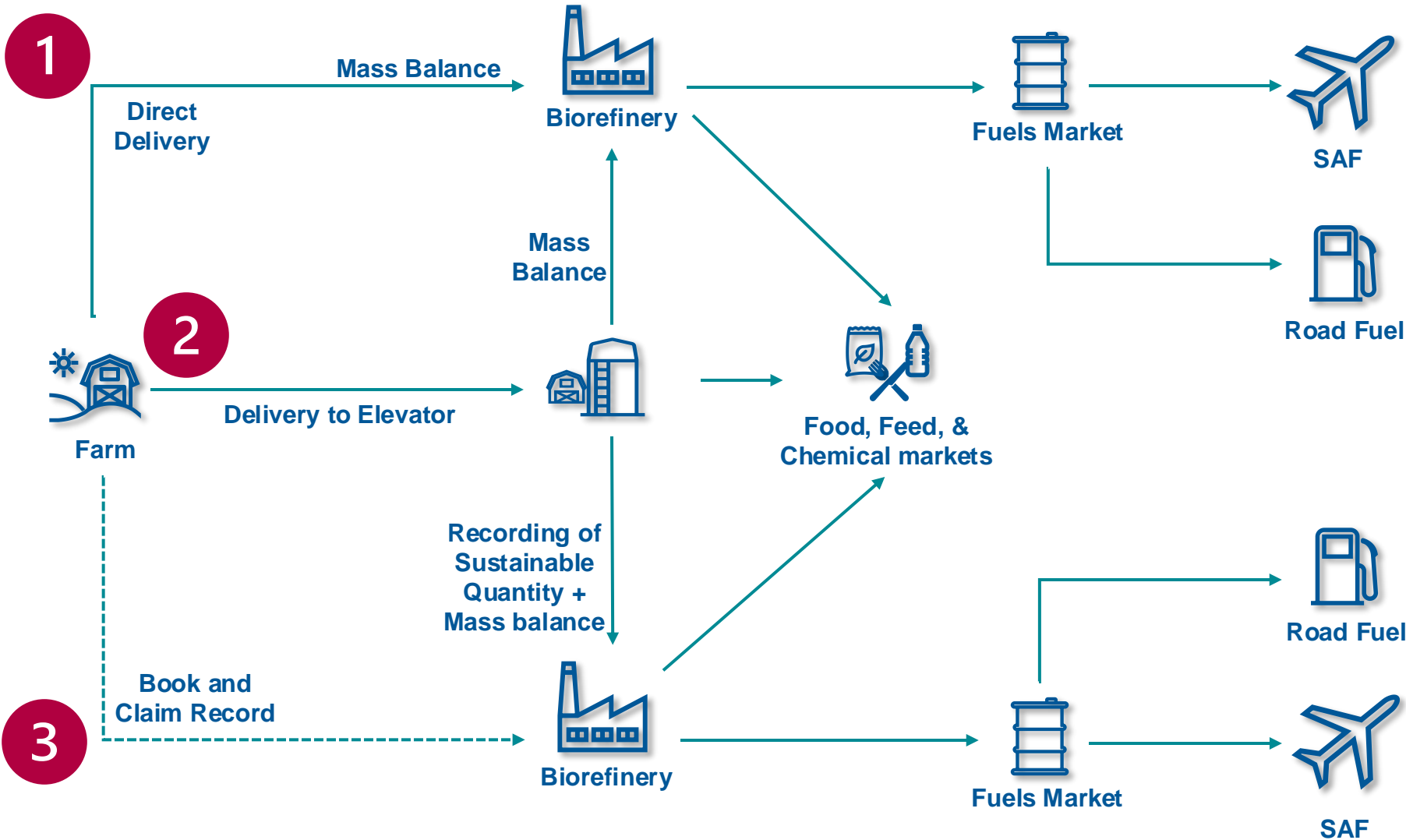
William Boatwright, NORDEN

3 US Grower Options to Participate in the Biofuels Market

Scenarios Under
CORSA, RED II,
Japan Biofuels
Policy

Agricultural Crop
Producers (i.e.,
corn, soy)

Scenarios Under
45Z & Voluntary
Markets



Book and Claim Considerations

- **Book and Claim Needs to Integrate with Existing Biofuels Policies that Promote Current and Future Grain and Ethanol Exports.**
 - Seamlessly integrate with existing biofuels policies where US corn is exported to international markets such as, for example, the Japan Biofuels Policy and the EU Renewable Energy Directive as well as CORSIA.
 - The book and claim system can be designed to audit for both book and claim and mass-balance at once via combination audits. This reduces the auditing burden on the growers.
- **Growers retain flexibility of their book and claim certificates.**
 - Book and claim certificates are issued to the growers.
 - Grower then has the flexibility to monetize the environmental attribute of corn represented by the certificate not only in the fuels markets but also in any corn/feed/biochemicals market.
 - This includes tax incentive markets (e.g 45Z), voluntary carbon markets, or feed/food producers with product or corporate GHG reduction goals.
- **Create opportunities for growers traditionally not delivering to ethanol plants.**
 - The book and claim system needs to be designed to enable participation by growers that are currently not delivering to an ethanol plant (e.g. growers in Southern Illinois).
 - Auditing capabilities must be scalable to provide geographic coverage across all corn growing regions from day one of the system

Summary Thoughts

- IL Case Study shows that GREET FD-CIC tool can be easily adapted to emphasize regionalized CSA benefits.
- In complement, Book and Claim Enables Participation of All Growers, Regions, and CSA Practices
 - Book and Claim Needs to Integrate with Existing Biofuels Policies that Promote Current and Future Grain and Ethanol Exports
 - Growers retain flexibility of their book and claim certificates.

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