



Maximizing the value of cover crops in the Pacific Northwest

**DOE Bioenergy Technologies Office (BETO)
Purposed Crop to SAF workshop
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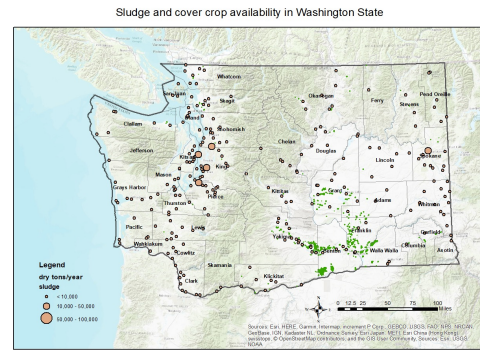
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Background on COVER CROPS as BIOFUELS

- Cover crops have multiple benefits- soil health is the most important benefit
- Cover crops as a feedstock for biofuels?

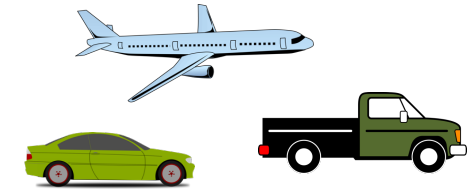
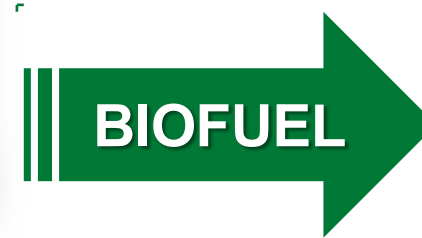


Cover crops in WA

Commercial feedstock
supply and logistic system



Biofuel production
(Hydrothermal liquefaction
and biocrude upgrading)



**7% of the U.S. Biofuel
production in 2021¹**

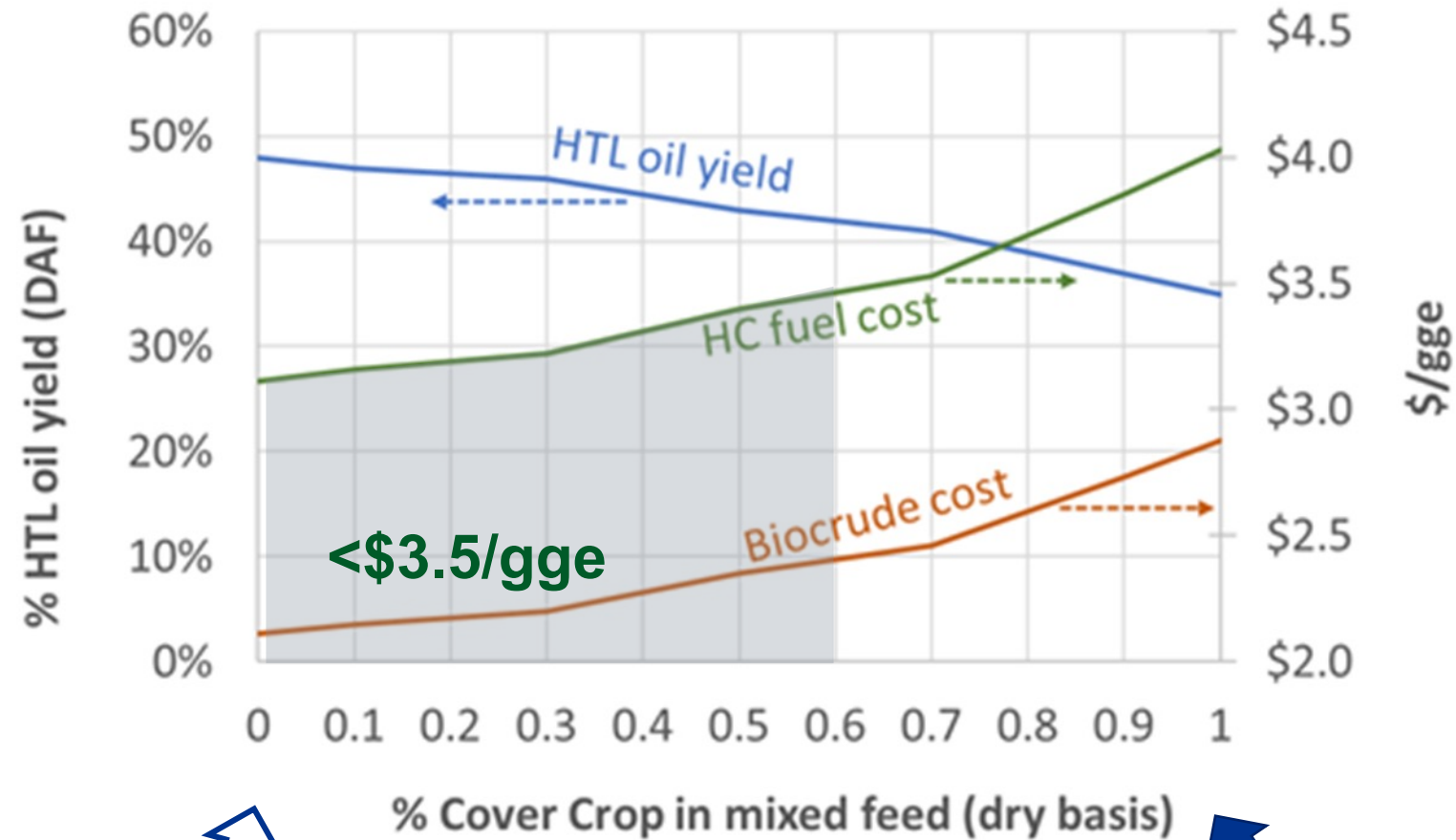
- Economic opportunity to benefit local and regional farmers that are part of minority groups and for energy production (used only in 3.9%² of all U.S. cropland in 2017; <1% in WA state³). Rural community rarely have access to research.
- Primary challenges to adoption are uncertainties in use of cover crops across states includes relative roles of *climate, soil type, production practices, and policy²*

⁽¹⁾ In 2021, U.S. ethanol production totaled about 15 billion gallons and combined biodiesel/renewable diesel production totaled about 2.5 billion gallons. ⁽³⁾WSDA- <https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use>

⁽²⁾Cover Crops, 2017 U.S. Census of Agriculture ⁽³⁾<https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use>

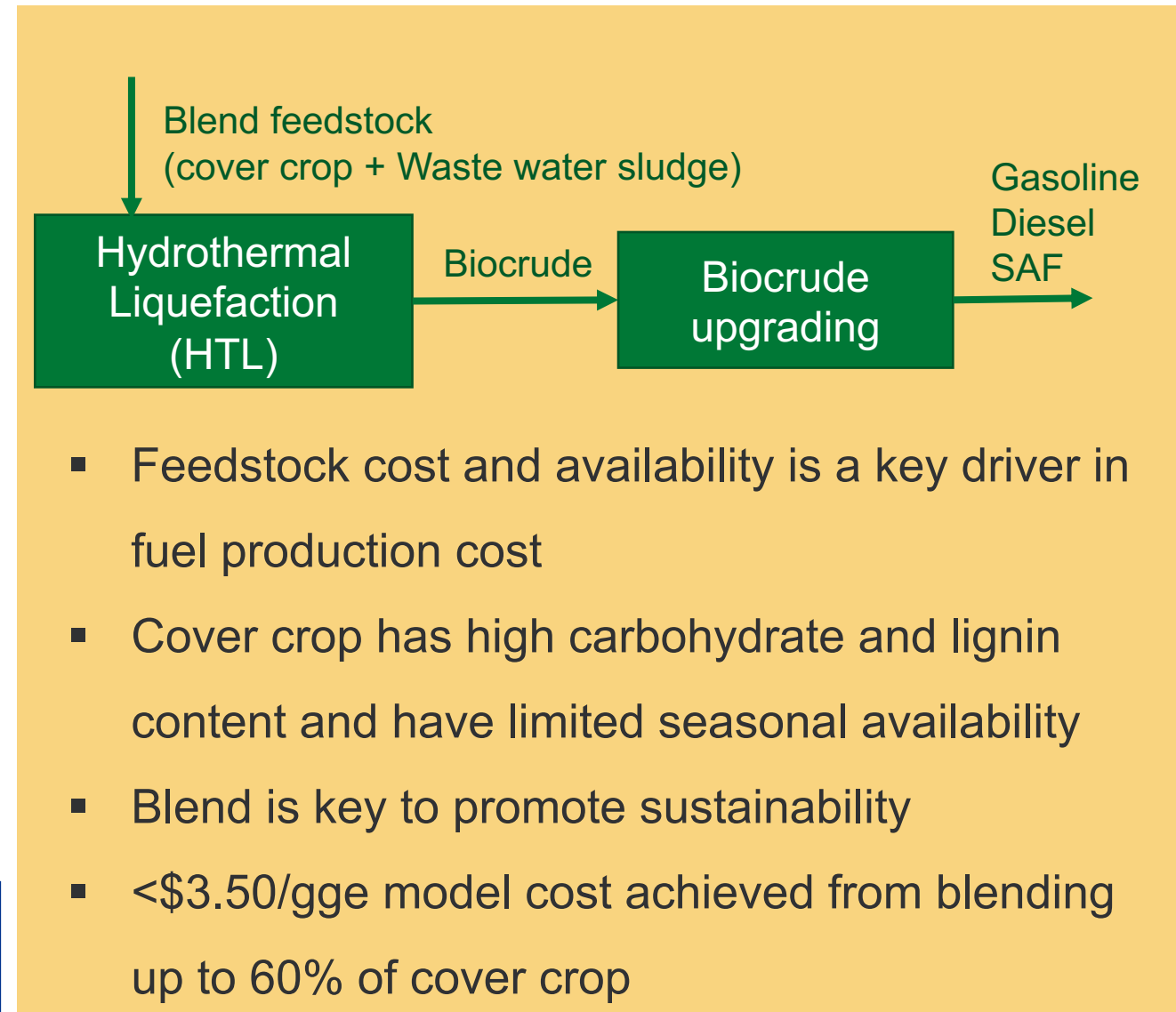
Key Strategy

BLENDING OF COVER CROPS FOR BIOFUEL FEEDSTOCK IS PRACTICAL TOWARD ACHIEVING <math>< \\$3/\text{GGE}</math>



100% wastewater treatment (WWT) sludge in biofuel feed

100% cover crop material in biofuel feed



Conclusion

COVER CROPS CAN INCREASE OVERALL PRODUCTIVITY OF THE LAND AND PROVIDE (+) BENEFIT FOR BIOFUELS PRODUCER

- Field experimental data from 1st year shows positive impact on growing cover crops
 - No negative impact on cash crop or soil health
 - (+) revenue from cover crops when sold as biofuel
 - Legume cover crops shows the lower CI due to less or no fertilizer requirement
- TEA for 1st year shows up to 60% blending of cover crops with sewage sludge can achieve modeled cost <\$3.5/gge and >70% CI reduction.
 - Increased cover crops adoption can help fill-in gap of feedstock availability.
 - Enable deployment of additional conversion pathways such as HTL to help meet the SAF volume goal by 2030.
 - HTL can 3.9 billion gal/y of SAF (Supply >20% of 2019 US aviation demand)

