



Oil Crop Perspective on Advanced Biofuels
Biomass R&D Technical Advisory Committee
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- **RFS2 is critical to the development of novel feedstocks for the production of advanced biofuels**
- **Provides market demand signal to agricultural producers**
- **However, the current implementation of RFS2 does not properly incent novel crops that hold the highest potential to satisfy the objectives of the EPA**





- RFS2 is in part designed to establish approved feedstocks to facilitate pathways for the production of advanced biofuels that achieve the requirements of the Energy Independence and Security Act of 2007 (EISA)
- The process employed by EPA for approval of feedstocks is appropriate for broad-scale or Tier 1 crops as it requires a data set not readily available for novel crops
- RFS2 does not include a defined path or comprehensive consideration for novel crop approval
- In fact, there are hurdles inherent in the RFS2 that hinder or prevent novel crops from achieving the scale necessary to allow development of the data required for consideration





- Current program inadvertently favors feedstocks with higher value uses
 - Data requirements rely upon commercial scale crop production & trials
 - Commercial crop production is driven by financial opportunity for farmers
 - Crops with alternative uses, such as Tier 1, have ample demand, production and data
- Ideal energy crops have low value/cost due to limited application/use
 - Crops grown specifically for conversion to advanced fuels rely upon demand for these fuels currently provided by the RFS2 mandates
 - However, without EPA approval these feedstocks cannot be used to satisfy the mandates
 - Further, they suffer an economic disadvantage by not qualifying for RIN generation





Ideal Feedstock Characteristics:

- Low Cost
- Non-Food
 - Inedible
 - Land-use
- Complement existing agricultural systems
 - Non-disruptive to current production crops
 - Utilize existing infrastructure
- Environmentally Sound

If not low-cost, will not be successful. This requires limited alternative use.





- Farmers are conservative and slow to adopt change
 - Empirically, we note that it generally takes three years for farmer adoption
- Novel crops imply risk:
 - Limited, if any, crop insurance
 - Do not qualify for RINs
 - Limited, if any, security of an end-market





- Majority of the cost of fuel production is the feedstock
- Without feedstocks commercially available at a cost comparable petroleum crude, RINs help offset the production cost gap, ultimately providing demand for these crops.





Without the ability to generate RINs, a renewable feedstock's market is limited typically to R&D

Today it costs ~ \$.48/lb. for the production of camelina oil. Soy oil trades for ~ \$.54/lb. Therefore, camelina oil should be competitive.

However, utilizing renewable diesel production with 90% conversion ratio as an example:

<u>Soy</u>	<u>Camelina</u>
.55	.48
<u>(.29)</u>	<u>--</u>
\$.26/lb.	\$.48/lb.

How can a novel feedstock grow to be commercially viable, develop the data necessary to prove qualification?





- Novel energy crops have dynamics distinct from Tier 1 crops and require unique treatment under RFS2 for the program to properly incent the best qualified feedstocks
- Immature crops, like camelina, are ripe for material step-changes in production yields
 - Agronomic practices
 - Breeding & genetic improvements
- Current RFS2 results in review of narrow/limited production data with high variability leading to wide ranging conclusions
- Recent lumping together of several wide-ranging types of novel energy crops for approval by EPA has resulted in significant NGO backlash





Policy Recommendations

- Development of policy that provides level economic incentives to novel crops during scale-up of commercial production
 - Will facilitate wider range of potential crops
 - Enable better fidelity of data
- Expedited process for limited RFS2 qualification
- Segregation of consideration of potential crops





Conclusions

- RFS2 is fundamentally critical to the development of feedstocks most suitable to achieve competitive production of renewable, sustainable advance biofuels
- Novel energy crops are subject to market dynamics that differ from mature crops
- RFS2 does not have a defined process or tools necessary to level the playing field for all potential oil crops
- Without implementing changes that address these competitive challenges, RFS2 will not efficiently promote development of the most effective oil crop solutions





Thank You

