



JOHN DEERE

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Dr. Cheryl Laskowski
Branch Chief, Low Carbon Fuel Standard
California Air Resources Board
1001 I Street
Sacramento, CA 95815

RE: Comments Relating to the February 22, 2023 Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard

Dear Dr. Laskowski,

On behalf of Deere & Company ("John Deere"), I appreciate the opportunity to submit these comments following the California Air Resources Board's ("CARB") *Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard* ("LCFS") on February 22, 2023, and specifically related to questions raised regarding crop-based fuels.

John Deere supports promoting an expanding, sustainable supply of U.S.-grown renewable fuels and feedstocks. The U.S. renewable fuels sector has delivered thousands of jobs to rural communities, enhanced U.S. energy security, provided cleaner-burning transportation fuels to U.S. consumers, and generated additional value for farmers. It is John Deere's hope that, backed by strong fuels policies, these producers can continue to add positively to our nation's economy and continue to play a key role in reducing emissions within the transportation sector.

In addition to supporting our customers who grow the feedstocks necessary to supply our nation's renewable fuels needs, John Deere is increasingly interested in low-carbon liquid fuels as part of the solution to reduce carbon emissions from off-road heavy machinery. While electrification may be a viable option in smaller and mid-sized equipment, larger equipment that performs a variety of jobs has power and operational requirements (including the need to respond to short planting and harvesting windows) that far exceed the energy density limitations of existing battery technology. For this category of equipment, low-carbon liquid biofuels present a significant near-term opportunity to reduce carbon emissions while also meeting customer needs. Importantly, all John Deere Tier 4 diesel engines can use biodiesel concentrations of up to 20% (B20) and renewable diesel at concentrations up to 100% (RD100).¹

It is also important to note that many John Deere machines will be used for 20 years or more, including new diesel-powered machines sold today. Therefore, biofuels such as renewable diesel that can power existing diesel technology without requiring significant engine

¹ <https://www.deere.com/en/engines-and-drivetrain/renewable-fuels/>

modifications are highly viable solutions for today as we pursue opportunities to reduce emissions for both the existing and future fleet of machines. However, if the availability of these fuels were to be reduced or phased out, it would result in drastic consequences for growers who have made significant investments in this equipment and consequently impact crop production.

One additional concern is that access to renewable diesel in rural parts of California where agricultural production occurs can be more limited when compared to availability in more densely populated areas. We therefore have concerns that certain proposals, such as setting caps on agricultural feedstocks for biofuels under the LCFS, would only further limit accessibility of these low carbon fuels and slow the opportunities for emissions reductions in heavy agricultural machinery. We therefore urge CARB against considering such caps so as to not limit the progress made by low-carbon biofuels in reducing transportation sector emissions.

Land Use and Food Production

One way CARB can ensure their programs do not have an adverse impact on land use or food production is to encourage traceability and field-level certification of growing practices. Using a conservative emissions factor as a default, but also allowing growers to certify their operations, is the strategy being employed by several active and proposed low carbon fuel programs around the world.

Creating a demand for field level data will also increase the adoption of precision technology and management practices, resulting in many benefits for producers including reducing emissions. This point is highlighted in a recent study published by the U.S. Department of Agriculture (“USDA”) Economic Research Service, which uses the example of automated guidance systems potentially reducing fuel consumption due to fewer overlapping passes in the field.² This type of data can be verified using the John Deere Operations Center today.

According to USDA data, much of the increased production of soybeans in the U.S. can be attributed to increases in yields per acre. Over the past three decades, average U.S. soybean yields have risen from 32.6 to 49.5 bushels per acre, a nearly 52 percent increase.³ Further adoption of precision agriculture equipment and technologies will not only further increase production per acre but also drive down the carbon intensity (“CI”) of crop production.

For example, a 2021 analysis completed by researchers at Argonne National Lab found the CI of corn ethanol decreased by 23 percent from 2005 to 2019, in part due to a 15 percent increase in corn yields despite constant fertilizer input intensity.⁴ Part of the increase in yield can be attributed to the adoption and use of precision agriculture equipment and technologies over that period. Broader adoption as well as the use of additional technologies, such as no-till air drill seeding equipment and variable rate or split fertilizer application, can further reduce the CI of biofuel feedstock production.

In addition to the existing sources of oil feedstocks, there are several promising new ventures into increasing oil content of existing crops as well as oilseed crops that can be grown as a second crop on existing agricultural acres or in marginal lands that are unsuitable for first

² Precision Agriculture in the Digital Era: Recent Adoption on U.S. Farms
<https://www.ers.usda.gov/webdocs/publications/105894/eib-248.pdf?v=9219.8>

³ https://www.nass.usda.gov/Charts_and_Maps/Field_Crops/soyyld.php

⁴ Retrospective analysis of the U.S. corn ethanol industry for 2005–2019: implications for greenhouse gas emission reductions. <https://onlinelibrary.wiley.com/doi/10.1002/bbb.2225>

generation feedstocks. Such initiatives can have many co-benefits, including for soil health and biodiversity.

Regulatory Mechanisms

We recommend looking to existing biofuels programs around the world that, while using conservative default emissions factors, would also allow growers to certify their operations as having lower carbon intensity, including from regenerative farming practices, reclamation of degraded land, and increased productivity on existing fields.⁵ Use of precision equipment and technologies can create a virtuous cycle of providing the data to track performance and then the insights to improve it over time. CARB should therefore consider rewarding producers for engaging in and verifying practices that demonstrate a reduction in CI.

In addition, as an alternative to moving forward with a proposal to place caps on virgin oil feedstocks, we encourage the Board to consider convening an Expert Working Group (“EWG”), similar to that employed by CARB in 2010 and subsequent rulemaking, to provide a third-party evaluation of this matter and report back to CARB on its findings and any recommendations. Given that caps on virgin oil feedstocks would disproportionately impact those in the oilseed and agricultural industries, we recommend that those sectors are adequately represented among the those who comprise the EWG. In addition, we recommend the EWG conduct a review of the LCFS’ indirect land use change (“ILUC”) modeling data to ensure the most current scientific data is being utilized.

Concluding Remarks

John Deere appreciates the opportunity to be an active participant as CARB continues implementation of the LCFS and considers program changes. We also reiterate our offer to work collaboratively with CARB on ways to ensure farmers are included as part of the solution to meet the State of California’s climate goals.

Sincerely,

Alexey Rostapshov
Head of John Deere Labs & Sustainability Solutions
Deere & Company

⁵ Report from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions on the status of production expansion of relevant food and feed crops worldwide. March 13th, 2019 <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A52019DC0142>