



August 8th, 2022

Cheryl Laskowski, Ph.D.
Chief, Transportation Fuels Branch
California Air Resources Board
1001 I street Sacramento, CA, 95814

RE: Proposed Changes to the Low Carbon Fuel Standard

Dr. Laskowski,

Thank you for the opportunity to provide comments on the changes being evaluated by LCFS staff.

The Iowa Soybean Association (ISA) was founded in 1964 by farmers to serve farmers. ISA is governed by a board of 22 farmers with a mission to conduct research, educate, and promote demand on behalf of the state's 40,000 soybean producers, including more than 12,000 ISA farmer members and industry stakeholders. ISA generates revenue through a one-half of one percent levy (commonly called a 'checkoff') per bushel of soybeans sold in the state of Iowa. ISA invests those 'checkoff' dollars to deliver programs and services that meet the needs of Iowa soybean farmers. From soybean research to new cropping rotations, sustainable management techniques, market development and communications, ISA is home to a suite of programs that provide information and assistance to help farmers be more competitive, profitable, and sustainable.

Much of our work extends beyond simply soybeans and includes researching more efficient cropping rotations, conservation practices, and sustainable management techniques; all with the goal of improving on-farm profitability. Practices include but are not limited to the adoption of cover crops, bioreactors, oxbows, and others which reduce nutrient loss, increase yield, and enhance profitability. The experimental outcomes of these practices are measured using robust primary data collection and are analyzed. ISA then works with academia, industry, and farmers to refine these practices and technologies before supporting broad implementation with partners like the Iowa State University Extension and Outreach which operates in all of Iowa's 99 counties.

This deep network of research and collaboration allows Iowa to produce about 14% of all soybeans, ranking Iowa as the second largest producer after Illinois. Iowa grown soybeans, among the most sustainable in the world, have long been a key ingredient into the global food and feed sectors. Increasingly, components of these soybeans are being used in biofuel and thousands of other bioproducts, displacing petroleum and creating more sustainable products.

Setting a Cap on Crop-Based Biofuels

ISA strongly disagrees with the public feedback provided to CARB. We also disagree with the assertion that a cap on crop-based biofuels would be effective at reducing food prices and avoiding potential deforestation. We are concerned that those promoting this cap lack a fundamental understanding of agriculture. In fact, we believe a cap would lead to the opposite effect – increasing prices, restricting food availability, and increasing GHG emissions across multiple sectors of the global economy.

In the strongest terms, we caution CARB against the adoption of European-style policy instruments, which have typically been cumbersome, overreaching, minimally scientific, and highly prone to political



manipulation. In essence, what is proposed is the exact opposite of how the technology neutral LCFS has been managed since its inception. In our view, it would be tragic if CARB were to move away from the bedrock, market-based approach, to one that is more like Europe, setting inclusion limits for certain technologies and raw material types. It is our view that a transition away from the current market-based, least cost reduction strategy approach would chill low-carbon investment and dampen interest in this policy design from jurisdictions across the United States, especially in Midwest states.

The inclusion of this stakeholder proposal signals CARB's willingness to abandon the current science-based approach that has worked so well for a knee-jerk, political approach, that has proved to be unhealthy for the European agriculture sector. This is critical since many biofuel programs were initially created with dual roles – adding value to agriculture and reducing GHG emissions. For a country like the United States which is a major producer and export of agricultural products, adding value to certain components of our abundant crops we produce domestically is key to ensuring overall farmer profitability, reducing the overall cost of food to domestic and global consumers, and maintaining competitiveness in the export market.

Potential Risks of a Crop-Based Cap

Potentially the most troubling aspect of this approach is CARB's apparent willingness to emulate European 'leadership' on agricultural policy. As we read this proposal, CARB, like Europe, is considering limiting the use of a specific crop for bioenergy production based on a crop's name and its place as a primary cash crop within a cropping rotation. This unscientific proposal in no way addresses the value or purpose of any crop in a cropping rotation. As an organization that represents farmers, we find it more than troubling that the proposal does not seek to address or even articulate an understanding of any potential unintended consequences of this action. For farmers, it's easy to see how the logical extension of such an ill-thought-out proposal could limit the increasing adoption of cover cropping and double cropping of rye, wheat, and oilseeds, as well as drive farmers to plant less productive, less nutritious, but now, at least in the eyes of certain stakeholders, more sustainable crops.

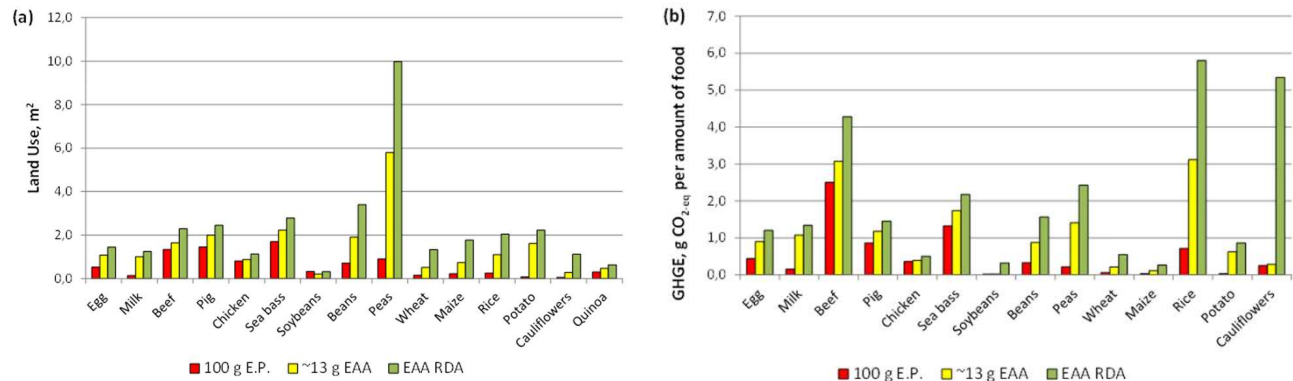
Today, growing conditions, international trade deals, market prices, federal agricultural programs, and energy policies create the economic signals which dictate what farmers across America plant for crops. For growers who choose to integrate soybeans into their rotation, the allure is clear – the crop produces a rich protein meal with a 'complete' protein profile and a vegetable oil product which is suitable for human consumption, but which also has endless industrial applications. These factors alone make soy highly functional and desirable by several markets ranging from animal feed to plant-based meat, and bioplastics.

In addition to the value of the soy crop the farmer sees extended agronomic benefits from planting soy. Since soybeans are a legume, they largely produce their own nitrogen from the atmosphere significantly reducing, if not eliminating, the need for synthetic nitrogen fertilizer. This natural form of nitrogen reduces the cost to produce soybeans and benefits the following cereal crop by reducing the amount of synthetic nitrogen needed. This highly sustainable form of natural nitrogen production is increasingly important in a world that is fertilizer short due to the Ukrainian war. Simply put, there is not another crop globally which can provide the same nutritional value per acre, while also requiring minimal inputs. This is just one reason why ISA believes arbitrarily capping a crop is a losing idea not only for the California LCFS, but for protein consumers globally.



ISA believes it is critical that in any discussion about crops that all stakeholders understand the nutritional function of certain crops. Fundamentally, a farmer can produce three nutrients from his or her operation: carbohydrates, lipids, and proteins. Each crop they produce yields some amount of each of those three nutrients. Often those nutrients are ‘upgraded’ to ‘complete’ proteins through animal agriculture. This is due to the fact that globally, proteins continue to be the most desirable and thus the most valuable of the three macronutrients.

However, a deeper look uncovers that not all proteins are created equal. This is true for soybeans, which have what nutritionists consider a ‘complete’ protein. In short, there are 20 different amino acids that form protein and nine that your body can’t naturally produce. These nine are considered ‘essential’ amino acids because we need to eat them, we can’t make them in our bodies. Soy is one of the few plant-based food sources that is a complete protein. This is critical to understand in a discussion framed around about food insecurity and deforestation. Soy is not only a source of all essential amino acids, but it produces them with far less land and far fewer GHG’s than most other sources. Essentially, markets demand soybeans because it is the most efficient and lowest cost source of complete proteins available to the world market.



(a) Estimated land surface (in square meters, m²) necessary to produce either 100 g (mL for milk) of each standard food product [A] (left bars in each triplet); an amount sufficient to provide 13 g of total essential amino acids (EAA) (middle bars) [B], or the recommended daily allowance (RDA) of all EAA, i.e. matching the RDA of the limiting amino acid (right bars) [C]. Data are referred to edible amounts of each food. (b) Estimated Green House Gas Emission (GHGE, in Kg CO₂-eq), necessary to produce either 100 g (mL for milk) of each standard food product [A] (left bars in each triplet); an amount sufficient to provide 13 g of total essential amino acids (EAA) (middle bars) [B], or the RDA of all EAA, i.e. matching the RDA of the limiting amino acid (right bars) [C]. Data are referred to edible amounts of each food.

Tessari, P., Lante, A. & Mosca, G. Essential amino acids: master regulators of nutrition and environmental footprint?. *Sci Rep* 6, 26074 (2016). <https://doi.org/10.1038/srep26074>

In a future market where CARB ‘sets an example’ by limiting the ability of certain crops to participate, the resulting economic disparity for that crop may result in that crop be replaced by a less efficient, but now more profitable crop. For example, replacing soy with an oilseed that has a higher oil content (but potentially inedible oil) and a lower protein quality is a real potential unintended consequence of this action. In this scenario if demand for EAAs in animal feed and human food stay the same, EAA would need to be produced from land expansion (domestic or international) or through more carbon intensive synthetic amino acid production.¹

¹ Pahola Thathiana Benavides, Hao Cai, Michael Wang, Nick Bajjalieh, Life-cycle analysis of soybean meal, distiller-dried grains with solubles, and synthetic amino acid-based animal feeds for swine and poultry production, Animal



In essence this proposal rather than promoting agricultural intensification, greater double cropping, and smarter management practices, could easily trigger acreage expansion while the market seeks to solve for the same protein, lipid, and carbohydrate supply using fewer available acres of sustainable U.S. soy.

Additionally, while this proposal seems to be geared toward the three main crops used in biofuel production today, it is not a stretch to see how this broad limit on 'crop-based' feedstocks could significantly chill the burgeoning cover crop and double crop sector, a sector which nearly all researchers agree is critical to achieving global food security while simultaneously reducing emissions. For example, the current proposal would likely categorize canola as a crop-based feedstock. However, in areas as far north as the southern two rows of counties in Iowa, which have been a reliable a corn, soy and pasture rotation, farmers are experimenting with canola as a double or relay crop – providing a third crop in two years on the same acre. Historically, farmers have not had access to varieties which were hardy enough and matured early enough to fit between corn and soy during a typical cold Iowa winter. The potential addition of canola to these prime acres offers extra protein per acre, but also provides more oil for food, feed, and fuel. This is in addition to providing all the traditional environmental-agronomic benefits usually reserved for conversations about 'dedicated cover crops'. In a world where crop-based biofuels are limited, this activity may not take place or at the very least, the cover crop employed would likely be non-productive, producing little to no food or feed as is the case for most cover crops today.

Creating an Additional Cap on Crops will Increase Emissions

As described above, U.S. soy is included in an innumerable number of products due to its function, price, and environmental profile. In fact, over the last 35 years from 1980 to 2015, U.S. soybean production increased by 120 percent; while during the same period, environmental outcomes improved drastically—on a per bushel basis, land use by soy growers declined by 40%, soil conservation improved by 47%, irrigation water use improved by 33%, energy use decreased by 35%, and greenhouse gas emissions decreased by 45%.² This is why soy is the sustainable ingredient of choice for a range of products from livestock rations³ to alternative meats⁴ and petroleum replacements⁵.

If CARB limits the use of crop-based biofuels (beyond existing federal limits), they will not only increase the cumulative amount of greenhouse gases emitted in the state, but they will also force excessive levels of criteria pollution on their citizens. This move would be inconsistent with both Assembly Bill 32 and the draft 2022 Scoping Plan Update. To that point, the recent scoping plan projects the state will demand roughly 2.5 billion gallons renewable diesel by 2030, nearly twice what is consumed today. This is consistent with the Governor's July 22nd letter to Chairwoman Randolph which requested increased emissions reductions from the LCFS.⁶ While liberalizing the LCA system boundary under the LCFS is one way to achieve this goal (farmers are eager to participate), the simplest way to reduce California's GHG inventory, the accounting ledger by which AB 32 is measured against, is to rapidly displace petroleum.

Feed Science and Technology, Volume 268, 2020, 114607, ISSN 0377-8401,
<https://doi.org/10.1016/j.anifeedsci.2020.114607>.

² Field to Market: The Alliance for Sustainable Agriculture, 2016. *Environmental and Socioeconomic Indicators for Measuring Outcomes of On Farm Agricultural Production in the United States (Third Edition)*.

³ [Sci-Hub | Life-cycle analysis of soybean meal, distiller-dried grains with solubles, and synthetic amino acid-based animal feeds for swine and poultry production. Animal Feed Science and Technology, 268, 114607 | 10.1016/j.anifeedsci.2020.114607](#)

⁴ [Why We Use Soy in Impossible Burger \(impossiblefoods.com\)](#)

⁵ [Danimer Scientific Research into Soybean Oil as PHA Source Continues | plasticstoday.com](#)

⁶ [07.22.2022-Governors-Letter-to-CARB.pdf](#)



Renewable diesel has shown to be highly effective. A cap would only restrict CARB, the governor, and the legislature's attempts to dramatically and rapidly reduce greenhouse gas emissions.

A Cap Already Exists Today

In addition to being detrimental to global food supplies, ISA also believes the proposal from CARB to create a new cap is redundant and arbitrary. We believe the current limits within federal policy, chiefly the renewable volume obligation and aggregate acreage cap, as well as current LCFS disincentives (ILUC) already create a 'pseudo cap' for crop-based biofuel use.

As CARB pointed out in their own presentation the federal Renewable Fuel Standard sets volumes for the national consumption of renewable fuels, including crop-based biofuels like soy-based renewable diesel. Currently, the federal consumption of these fuels is over twice that of California's. Meaning, that while the amount of lipid-based fuel in California has increased dramatically in the last number of years, it has not necessarily resulted in an equivalent increase nationally. Until the LCFS creates demand for renewable diesel exceeding the volume required under the annual RVO, there is no need for California to consider a cap.

In addition to the existing 'hard cap' enforced federally, the LCFS already contains mechanisms to disincentivize crop oils, which is why the LCFS has attract only a fraction of the soy oil-based biofuel projected in the 2015 ILUC working group.⁷ Historically, the LCFS has sought to evaluate the sustainability of transportation fuel based on a life cycle carbon intensity. While we don't always agree with CARB's methods, such as truncating system boundaries from crops and electric vehicles arbitrarily, we nonetheless appreciate the systemic approach to environmental evaluation. With that said we implore CARB to continue evaluating the carbon intensity of all fuels based on the principles of life cycle assessment, not arbitrary volume-based limit.

Seeking Real Solutions

We appreciate the interest the Air Resources Board has taken in the use of agricultural products. We too recognize that components of crops can be very useful for biofuel production as well as a number of other sustainable products. Additionally, we recognize that demand for crop-based biofuels is an incredibly small part of the overall market for agricultural products. We often describe biofuels as the 'tip of the tail which can wag the dog'. ISA agrees with leading agricultural researchers at Purdue, USDA, and others that a primary factor driving demand for global agricultural commodities is trade. We encourage CARB to review the two papers we have included on this topic.^{8,9} We look forward to collaborating with CARB and providing any additional resources you may need.

As all stakeholders look for solutions to create more sustainable food, feed, fuel, and fiber for a world population that is growing in size, and in wealth, U.S. soy will continue to be a key contributor. As CARB considers the future role of soy and other sustainable U.S. crops, ISA and our partners are looking forward to having a serious and open dialogue on this topic. We believe that the smart approach forward is to consider a differentiated approach which recognizes certain countries like the United States and Canada have a far more efficient and sustainable agricultural system than other crop growing regions around the world. In fact, the data to sort leader from laggard already exists, and modern programs like the Canadian

⁷ [Detailed analysis for indirect land use change \(ca.gov\)](#) Table H-1

⁸ [Interdependence of China, United States, and Brazil in Soybean Trade \(usda.gov\)](#)

⁹ <https://www.gtap.agecon.purdue.edu/resources/download/10178.pdf>



Clean Fuel Standard recognize that using a more direct method such as Agri footprint¹⁰, in place of one-size fits all ILUC estimate, yield a more science-based and ultimately, effective, and efficient climate policy. For farmers to achieve the dual responsibilities of providing food and energy in an increasingly sustainable manner, policy needs to reward leaders and encourage laggards to improve, rather than continuing to rely on a highly subjective, unscientific, one-size fits all approach.

Thank you,

Matt Herman

Matt Herman

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¹⁰ [Blonk Sustainability | Agri-footprint](#)