Report Reveals the Massive Land Area Needed to Meet Future Sustainable Aviation Fuel Goals

A SAFPath.com report reveals the immense farmland needed for SAF production, urging technological advancements to meet future jet fuel demands.

Matthew Fischbacher - "These findings underscore the need for a diversified approach to SAF feedstock development."

NEW YORK, NEW YORK, UNITED STATES, September 2, 2024 /EINPresswire.com/ -- A recent report from SAFPath.com has brought to light the immense land-use challenges that the United States faces in its pursuit of Sustainable Aviation Fuels (SAFs) to replace conventional jet fuel. Titled "Sustainable Aviation Fuels: A 30,000 Foot Perspective," the report provides a detailed analysis of the land required to produce the SAF necessary to meet the anticipated 2050 jet fuel demand in the U.S.

Staggering Land Requirements: The report's findings indicate that theoretically up to 80% of US farmland could be required to fulfill the nation's jet fuel needs by 2050 if current feedstock options are utilized. For instance, to produce 100 million metric tons of SAF using agricultural residues through Fischer-Tropsch (FT) technology, an estimated 714 million acres—equivalent to 80% of US farmland—would be needed.

Key Insights from the Report:

Agricultural Residues: Utilizing agricultural residues, a seemingly abundant resource, could demand up to 80% of US farmland, highlighting the scale of land required to meet jet fuel needs through SAFs.

Jatropha Seed and Soybean Oil: Other feedstocks like Jatropha seed and soybean oil also present significant land demands, requiring 38% and 64% of US farmland, respectively, when used to produce SAFs via HEFA (Hydroprocessed Esters and Fatty Acids) technology.

Potential Solutions: On the other end of the spectrum, feedstocks like algae show promise due to their significantly higher yield per acre. With advanced FT technology, algae could fulfill SAF demands using only 0.8% of US farmland, pointing to the critical role of technological innovation in reducing land use.

The Challenge Ahead: As the aviation industry pushes towards sustainability, these findings emphasize the critical need for innovation in feedstock selection and cultivation practices. While the potential for SAFs is undeniable, the challenge lies in scaling production without overwhelming the nation's agricultural resources.

SAF Path's 2024 report on Sustainable Aviation Fuels highlights the land required for various feedstocks to fulfill the entire U.S. jet fuel needs with SAFs.

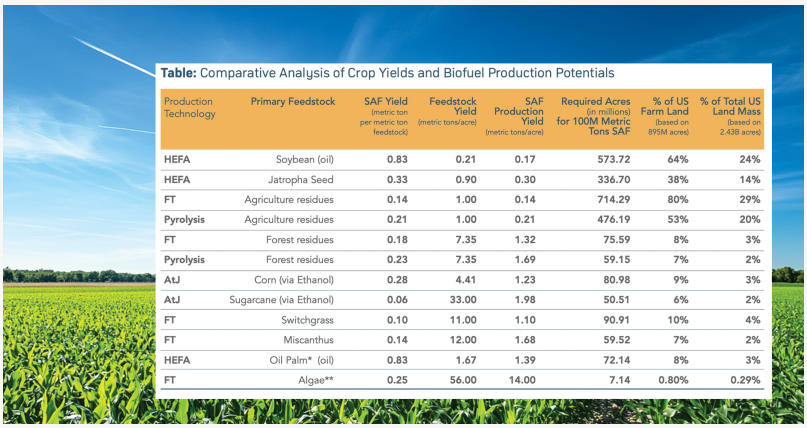

Table: Comparative Analysis of Crop Yields and Biofuel Production Potentials

Production Technology	Primary Feedstock	SAF Yield (metric ton per metric ton feedstock)	Feedstock Yield (metric tons/acre)	SAF Production Yield (metric tons/acre)	Required Acres (in millions) for 100M Metric Tons SAF	% of US Farm Land (based on 895M acres)	% of Total US Land Mass (based on 2.43B acres)
HEFA	Soybean (oil)	0.83	0.21	0.17	573.72	64%	24%
HEFA	Jatropha Seed	0.33	0.90	0.30	336.70	38%	14%
FT	Agriculture residues	0.14	1.00	0.14	714.29	80%	29%
Pyrolysis	Agriculture residues	0.21	1.00	0.21	476.19	53%	20%
FT	Forest residues	0.18	7.35	1.32	75.59	8%	3%
Pyrolysis	Forest residues	0.23	7.35	1.69	59.15	7%	2%
AtJ	Corn (via Ethanol)	0.28	4.41	1.23	80.98	9%	3%
AtJ	Sugarcane (via Ethanol)	0.06	33.00	1.98	50.51	6%	2%
FT	Switchgrass	0.10	11.00	1.10	90.91	10%	4%
FT	Miscanthus	0.14	12.00	1.68	59.52	7%	2%
HEFA	Oil Palm* (oil)	0.83	1.67	1.39	72.14	8%	3%
FT	Algae**	0.25	56.00	14.00	7.14	0.80%	0.29%

The land use required to fulfill U.S. jet fuel needs

Technological Innovations Are Key: The report highlights that future technological advancements in feedstock development and processing efficiency will be crucial in overcoming the significant land-use barriers. By investing in research and innovation, the industry can reduce the reliance on vast tracts of farmland and move towards more sustainable, scalable solutions.

> Technological innovation is crucial to reducing the massive land use required for SAF production"
>
> *Matthew Fischbacher*

SAFPath.com Report Author:
Captain Matthew Fischbacher, who authored the report, commented, "Feedstocks like algae offer a scalable solution, potentially fulfilling SAF demands with just 0.8% of US farmland, highlighting the importance of advanced technology."

Maria Kuehn

SAF Path
email us here
Visit us on social media:
LinkedIn
