Observatory of Trends in Biofuels and Bioproducts

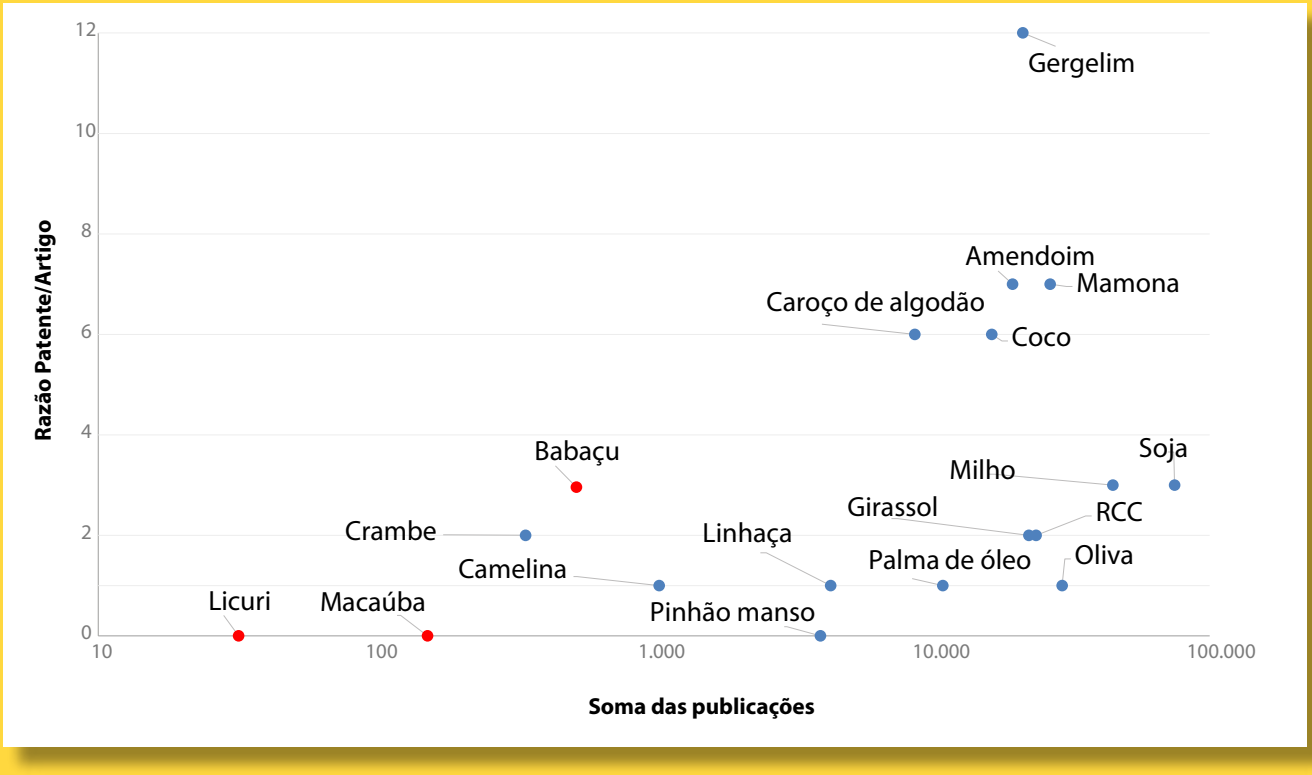
Theme: Vegetable oils

PROSPECTIVE STUDY OF VEGETABLE OILS

Bibliometric/patentometric data and signal studies

Future studies published in 2022 by Embrapa Agroenergia show trends in the development and application of vegetable oils in the oleochemical scenario, considering 18 plant species, including exotic and native ones. It was possible to specify which oleaginous sources are already consolidated and which ones have the possibility of expansion to meet the demand associated with vegetable oils, from the survey of bibliometric and patentometric data. A complementary study with a focus on biofuels concluded that the vegetable oil input has had application concentrated in the technological area of Science of polymers. Concerning the area of Energy and fuels, technological development points to growth in lubricant compositions.

Patent and Article Ratio



Graphic from the publication SANTOS, A. C. dos; FERREIRA, P. M.; LOPES, C. L.; BRAGA, M.; VIANA, N. M. **Estudo prospectivo de óleos vegetais**. Brasília, DF : Embrapa Agroenergia, 2022. (Embrapa Agroenergia. Documentos, 41)

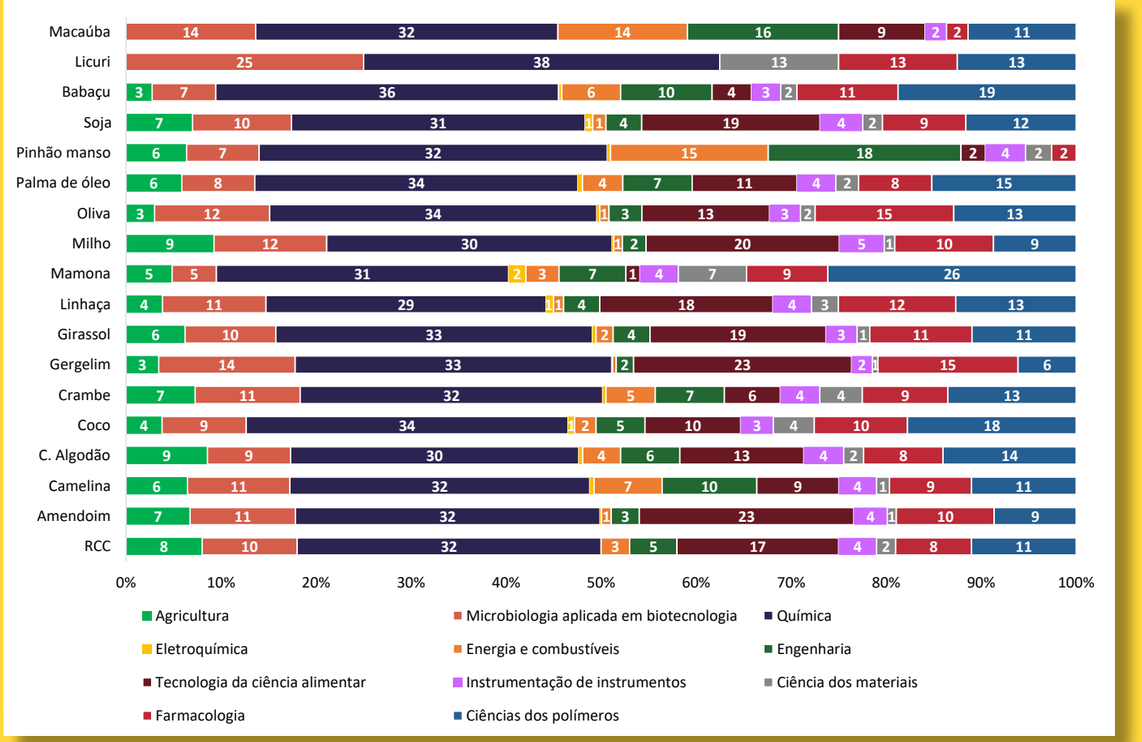
Between 2008 and 2017, scientific publications on oilseeds had a significant increase of 130% in Brazil and 120% worldwide. However, this advance in scientific publications in Brazil is not reflected in the number of patents. It means that there is a gap between scientific knowledge and the technologies capable of providing patents. Although Brazil is the fourth country that most publishes scientific documents, it is only the tenth in number of patents associated with vegetable oil in the world. Thus, there is a great opportunity for the development of technologies, since the technological maturity of some species, such as licuri palm and macaw palm, is still low.

The Patent and Article Ratio chart shows this gap, by oleaginous source. The closer to the x axis, the lower the technological maturity.

In addition to technological development, it was also possible to see that the areas of Agriculture and Cosmetics are the ones with the highest number of patent depositors globally. On the other hand, in Brazil, the companies that have the most patents are in the fields of Chemistry and Agrochemistry. In general, the area of Chemistry has the highest number of patents globally, followed by the areas of Polymer science and Food science technology. It is noteworthy that, when considering the data of all plant species, the area of Energy and fuels is not a highlight in technological development.

Finally, the study shows the evolution of technological areas by species. The search during the study period for vegetable oil and then for vegetable species ranked the ten most recurrent IPCs (International Patent Classification). Considering vegetable oil, regardless of the source, the most recurrent IPCs indicated technological development in the areas of animal feed, human food, preparations for the medical field and for use in cosmetics/personal hygiene. The results by species are also presented in the study and, depending on the source, the recurrence is changed.

Patents by area of knowledge



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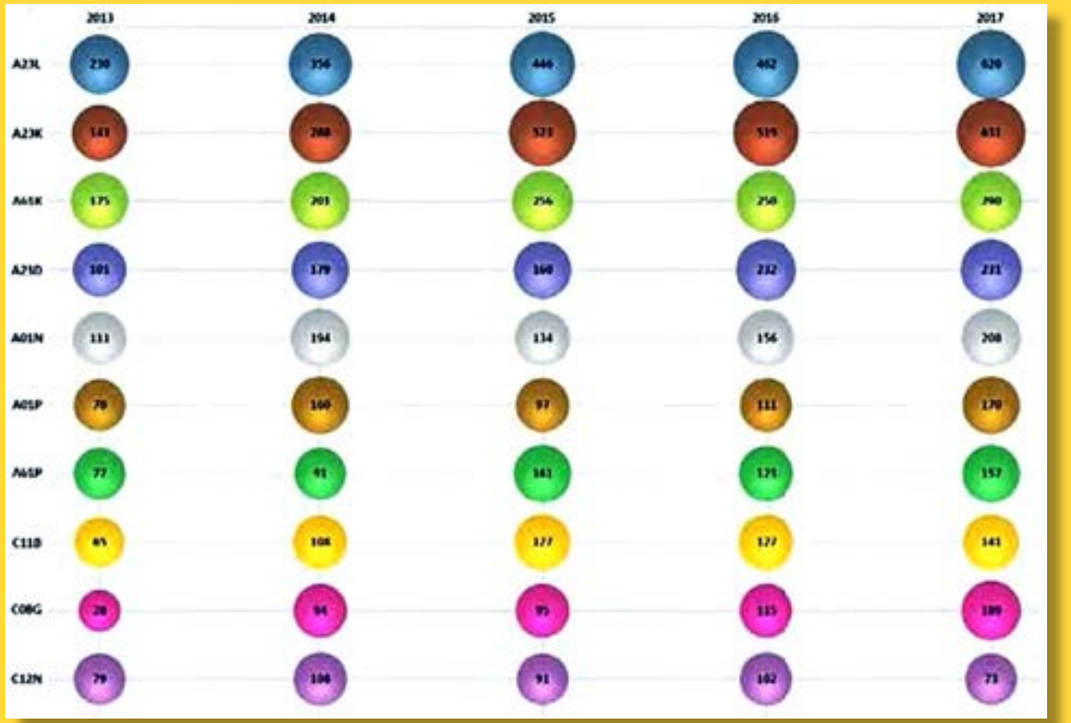
Evolution of four-digit IPCs for oil palm

Graphic from the publication SANTOS, A. C. dos; FERREIRA, P. M.; LOPES, C. L.; BRAGA, M.; VIANA, N. M. **Estudo prospectivo de óleos vegetais**. Brasília, DF : Embrapa Agroenergia, 2022. (Embrapa Agroenergia. Documentos, 41)

The result of the bibliometric and patentometric study associated with vegetable oil raised interest in identifying the trend of application of this input in the area of Energy and fuels. Using the signal detection methodology - used in future studies - it was possible to identify the emergence and immersion, strong or weak, of IPCs categorized in the area of Energy and fuels. In this study, the methodology used resulted in the selection of four plant species: cottonseed, castor bean, oil palm, and unified rapeseed, canola and colza (RCC). The result indicates a slow and gradual tendency for the application of vegetable oil from these species in lubricating compositions ●

Evolution of four-digit IPCs for rapeseed, canola and colza (RCC) unified in search



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Prospective study of vegetable oils

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