

High living costs, the economic crisis and rising fuel prices are just a few realities on the minds of Spanish scientists. Researchers at the Universidad Politécnica de Cartagena in Murcia, Spain hope to relieve some of these issues through the development of bioethanol derived from citrus rinds. 

Head researcher Antonio López spoke with [www.freshfruitportal.com](http://www.freshfruitportal.com) about this innovative project that plans to put fruit byproduct to good use.

"There is production of 600,000 tons (MT) of citrus rinds a year in the Murcia region. It's a byproduct that's not being utilized and we use it for bioethanol, essential oils, etc. It can also be used for animal feed," López said.

Based on these possibilities, researchers from the School of Agricultural Engineering have worked to improve conversion to ethanol from rinds leftover from mandarins, oranges, lemons and grapefruit.

López described a variety of benefits from utilizing citrus rinds, including environmental factors and the low cost, since the product would have otherwise been discarded. Of every 100 kilos of oranges, 55 are rinds that could be used for other purposes.

Through the project, the researchers hope to open a door to the world of fuel and environmental sustainability.

"Producing gasoline is expensive because you have to refine oil which has a high energy cost. In contrast, this project is low cost, which means it could be competitive. Also, it's an alternative to using grains for biofuel, which has a relatively high cost. Grains also compete to supply food. We don't have that factor," López said.

"This could be a small contribution to supplying fuel. If I'm not mistaken, with this fuel we could move 14,000 cars for the entire year. It's a small contribution but we can move closer to utilizing all of this raw material at our disposal."

During this research period, the team achieved output of over 70 liters of bioethanol per 1,000 kilos of fresh orange rinds. The "steam explosion" technique allowed reduction of enzymes and improved the recovery of essential oils.

"This project is in the phase of developing a plant prototype. The problem is that it's being done in the middle of an economic crisis. There's money but there's fear, which paralyzes money. If this changes, at least for this type of initiative, we can move forward," López said.



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