New way to get more oil from seeds

Scientists here genetically modify seeds to get up to 15% more oil; agriculture industry could benefit

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Local scientists may have found a way to make plant seeds produce more oil, which could have implications for crops such as oil palm.

Their new method involves genetically modifying plant seeds to produce up to 15 per cent more oil than usual.

The new method can also be applied to crops, such as canola, soya bean and sunflower. These crops make up part of a multibillion-dollar industry that continues to see increasing global demand.

Assistant Professor Ma Wei from Nanyang Technological University’s School of Biological Sciences told The Straits Times on Thursday that he led a team of four in developing the patented method.

The protein that was modified, known as Wrinkled1 or WRI1, regulates the amount of oil produced in plant seeds.

Prof Ma said the protein is like a “gear” in a machine that does not turn as smoothly and quickly as it should.

What he and his team did was to examine the plant’s genes, modify the Wrinkled1 protein, and in doing so make the “gear” in the machine perform in optimum potential without affecting cell function.

The team tested this genetic modification in the Arabidopsis plant — a small flowering plant that is commonly used as a model for other plants in laboratory tests and research as it contains all the characteristics of crops.

It found that under laboratory conditions, the modified Arabidopsis plant seeds contained larger amounts of oil, up to 15 per cent more natural oils than seeds in unmodified plants.

The method of genetic modification, Prof Ma said, can be transplanted from the Arabidopsis to any plant to modify any variant of seeds.

“Plant seed oil is an essential component in our daily diet and the agricultural industry is seeking ways to maximise plants’ yield while reducing environmental effects of crop cultivation, especially land use,” said Prof Ma, who has been working on the project for 16 years.

“Our research helps to increase the production of seed oil in a sustainable and cost-effective way, and also opens up doors in agriculture research,” he added.

The research findings were recently published in the scientific journal Plant Signaling & Behavior.

Agriculture companies told The Straits Times that the study looked promising.

Dr Bu Shen, a senior manager at DuPont Pioneer, a United States-based international producer of hybrid seeds for agriculture, said: “Prof Ma’s research on WRI1 could have global importance.”

“Understanding better how WRI1 regulates oil biosynthesis could inform how we breed plants that produce more oil.”

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