

Old McDonald Had a Phytochemical

November 7 2007

Forget the moo-moo here and quack-quack there. Farmers may find phytochemicals to be the barnyard bonanza.

And water may be the drop in the bucket that cashes in on the tug-o-war between urban and rural interests, according to research by the Texas Agricultural Experiment Station.

That's because applying less water to certain vegetables in the farm patch increases disease-preventing phytochemicals, or nutrients, for which consumers may one day pay a premium, scientists say.

“When we know what phytochemicals a vegetable contains, then the environmental and cultural strategies a grower uses can have an important impact on their content,” said Dr. Daniel Leskovar, horticultural researcher for Texas Agricultural Experiment Station in Uvalde.

He said growers are increasingly becoming aware of the importance of phytochemicals in vegetable crops and know the key component for selling the crop still is quality.

“Attributes -- color, size, texture -- are still extremely important in the produce market,” he said. “But the consumer is rapidly gaining knowledge about the benefits of phytonutrients that these vegetables contain. We can see that a segment of the consumer population is more prone to consume this type of product at the higher price.”

An independent survey for the United Soybean Board this year indicated “60 percent of consumers are willing to pay extra for healthier foods.”

From the time a tiny seed or transplant is plunged into the soil until it is harvested, a vegetable plant is subjected to a multitude of manipulations aimed at producing the most and best for consumers.

Everything from the precise day of planting to the type of soil and growing temperatures can determine the outcome. Leskovar said a plant that grows tall or wide in a given year could be either because of its variety or because it had the right irrigation, or proper fertilization – or both.

But Leskovar said researchers are beginning to examine beyond the size of the crop and pounds it yields to determine the content of healthy compounds in the produce and how farming methods may alter those.

Because water is becoming more restricted for farmers in southern and western Texas, Leskovar said, scientists decided to look at what would happen to the compounds if the traditional amount of moisture put on the crops was reduced.

“Why irrigation? We depend on irrigation from the Edwards Aquifer which is the main source of water for over 1.7 million people and also is the main source for irrigation in the Winter Garden area,” he said. “We expect that the water-use regulations are going to be harder, and so we have to be prepared for using less water.”

Currently, farmers in that area are not allowed to use more than 24 inches per acre in a given year. If that amount has been applied, a grower can not use more water on a food crop to save it, even if drought threatens to kill the entire field.

By comparison, turf grasses need about 1 inch of water a week – 52 inches a year - to stay green and growing, according to American-Lawns.com, an independent turf education entity.

But farmers may have a better incentive to reduce water on crops, Leskovar noted, if they can draw a higher price for the health aspects.

First pick for the research were watermelons, Leskovar said. As their very name suggests, melons need lots of water. Also, they contain carotenoids and lycopene – antioxidants that protects against cancer and other diseases in humans.

“Lycopene does not decrease and can actually maintain or even slightly increase with deficit irrigation without having too much of significant loss in yield,” he said. “We also know that lycopene increases with maturity. So the more precise the timing of harvest, the greater the potential for more lycopene in those watermelons.”

Leskovar and fellow researchers in Uvalde performed similar studies on other crops such as spinach which is high in lutein, beta carotene and vitamin C.

“If we could reduce by just 25 percent (of the optimum water amount),” he said of the results, “we would have a slight decline in yield as expected, but we would have a significant increase in phytochemicals for spinach.”

They also will experiment applying the irrigation water in different ways such as through a center pivot or by subsurface drip to find the most efficient way to apply less water.

“The industry does not demand per se a high lycopene tomato or high beta carotene spinach,” Leskovar said. “I feel that in the near future,

there will be a segment that will be demanding a product with high phytochemical content. But of course, this will take a little time.”

When that happens, the methods being verified through these scientific studies now will be ready for grower application, he said.

“We are kind of anticipating to that aspect, so that we will be ahead of the game,” he added.

Source: Texas A&M

Citation: Old McDonald Had a Phytochemical (2007, November 7) retrieved 26 April 2024 from <https://phys.org/news/2007-11-mcdonald-phytochemical.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.