

# Growing Sugar - the currency of life for plants

*Q: What does photosynthesis have to do with growing sugar?*

*A: All green plants make sugar. Some store more than others, but all plants make sugars as a way to store and manage energy which originally comes from sunlight.*

Photosynthesis is often associated with plants growing. But in reality, plants use photosynthesis specifically to make sugar using captured light as the energy, carbon dioxide as the base and hydrogen and phosphorus as the energy storage bits. We often focus on the captured carbon when we think of photosynthesis but the whole process is about storing energy, which is why a molecule of sugar is what is made whenever things photosynthesise.

What is important in this sugar production, from a plant grower's point of view, is that the plant needs help to make the sugar it stores. Plants get about 20% of the energy they use to make sugar during photosynthesis from stores of energy in the soil. This is critical. Everyone knows someone who has said that when the soil is healthy, grass tastes sweeter. And it is basically true; plants get help in the manufacture of sugar from microbes which live in healthy soil. So when the soil is healthy plants function better and can make more sugar. Plants trade off sugars and other "sweeteners" with fungi and other organisms in the soil in exchange for nutrients, energy compounds like ATP, and "building materials" like enzymes and proteins. If the microbes supplying these compounds are themselves in short supply, the plant suffers. Conversely, when populations of microbes in the soil are abundant and diverse, there is more of what the plant needs available and the cost (to the plant) is cheaper. Think of it like a fully operating economy. It takes all sorts of participants large and small to make the system work well, and it works best when all are present and happy.

Nutrients may be the stock in trade in this economy, but sugar is the currency that drives it. Plants need energy from microbes in the soil to make sugar, and they spend sugar to buy nutrients. Obviously, the less they need to spend to stimulate the supply of the nutrients they need, the more sugar the plant has left for us to harvest.

A key element in building this microbial marketplace, is the presence of special photosynthetic bacteria.

These microbes capture sunlight and make the special energy transport compounds and sugars on which other microbes depend. Plants also depend on these organisms to supply the system with sufficient energy so that all the other functions – including the manufacture of sugar by plants – can continue. These microbes catch sunlight, catch carbon and make sugar. They also share captured energy in the form of special energy transport proteins and by sharing sugars. When the soil is full of a rich mix of bacteria doing this energy harvesting and sugar manufacture job, plants benefit.

In the sugar economy, plants act like banks. They borrow and they lend. But no bank makes money without activity by others. So if we want to grow sugar, it pays to give some thought to the folks who help make, circulate and trade in sugar all around the plant. Bacterial photosynthesis and the sugar economy underground are what feeds, tends and energises plants. It might be time to think of this army of little guys when next you plan to build the sugar in your crop.

*\*Ken Bellamy is the director of Townsville-based biotech company Vital Resource Management (VRM), which he established in 1997 to offer sustainable and affordable improvements in water management and food production. He is also a director of Prime Carbon, set up in 2004 to help assess and register farm-based carbon offsets. Please e-mail questions to: [enquiries@vrm.com.au](mailto:enquiries@vrm.com.au)*



Kalamia 14  
Cane Growers



## Wassy's

### Mini Loader Hire

### HOLE BORING

### TRENCHING

### BUCKET



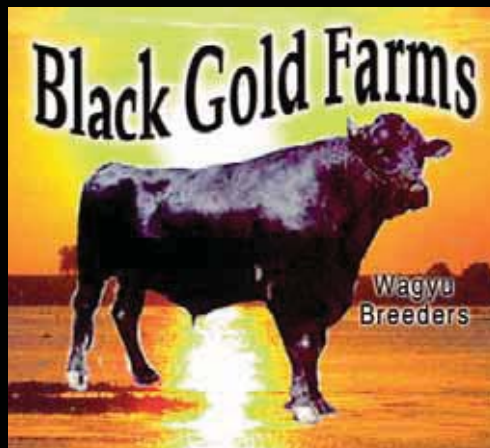
### KANGA MINI LOADER

### GIVE WASSY A CALL

### PH: 0429455360



- \* TRENCH - 700MM DEEP x 100MM WIDE
- \* BORE HOLE SIZES - 200MM, 300MM, 450MM
- \* HIRE MINI LOADER WITH OR WITHOUT DRIVER



## Jim and Jan Jones

67 Seaforth Rd Ayr  
PO Box 105 Ayr Q 4807

Phone 07 4782 4236

Fax 07 4782 4022

Mob 0428 824 236

[www.blackgoldfarms.com.au](http://www.blackgoldfarms.com.au)

[info@blackgoldfarms.com.au](mailto:info@blackgoldfarms.com.au)