



## Plant energy reserves are built by carbon flows

This perennial grass plant is struggling to come out of dormancy after good rain. The reason is because it is short of stored energy. The dead plants around it probably looked like this before they died. This is a landscape and a business that is in trouble because the role of flowing carbon is not understood.



In the first column it was discussed how all life can't exist without energy. The fifth column explained how carbon flows carry energy for all life to call on.

## The energy story from a plant's perspective

At the end of dry times, perennial grasses are dry old butts that have no green leaves to promote photosynthesis. Yet they grow with the arrival of rain, so obviously they have a mechanism to start growth after rain. We know that plant growth requires energy, so it is obvious that they must be sourcing energy from somewhere.

It is the roots that hold reserves of plant carbohydrates (starches/energy) needed to stimulate growth when suitable growing conditions arrive. Some reserves are also held in the crown of perennial grasses. Apart from instigating growth after dormancy, these root reserves are also important for maintaining the plant's tissue during drought, when photosynthesis is not occurring.

When perennial grasses have enough leaf area, they become self-sufficient in energy through photosynthesis, and no longer rely on the energy supplied by the roots. With more growth, they start putting energy back into storage in the roots. When animals maintain leaf biomass at a low volume after rain, the root reserves used for initial growth are not replenished. If this happens on a regular basis then the energy reserves will eventually be depleted.

## Plants have to eat too

Photosynthesis is plants sitting down to a meal. If we try to maintain our body function without eating, we become anorexic. Any living thing that keeps drawing on energy reserves, without eating, eventually dies. As a living thing, plants are no different. Root reserves should be thought of as reserve food, like the fat in our body. The horror images that come from Africa of emaciated people are no different to degraded pastures, in terms of the root cause.

Running energy reserves down in a plant is like letting a car battery go flat. The car won't start.

Because perennial grasses produce less foliage from rain as they become unhealthy, this increases the grazing pressure on the rest of the plants in the pasture. The flow-on effect is that the health of the other plants will also drop, and so the pasture continues to decline at an increasing rate, all else being equal. Unhealthy plants are also more likely to suffer insect attacks.

Energy reserves in plants are short term carbon brought in by carbon flows.

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**Next week's discussion: "Why we make the decisions we do".**