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Diversify rotations to improve yields says Nuffield scholar

By Catherine Norwood

Crop rotations are the key to more sustainable farming systems says Victorian Nuffield Scholar Ben Morris, who has spent three months investigating soil improvement techniques being used around the world to increase yields.

Mr Morris says he was inspired to apply for a Nuffield Scholarship because his crops at Toongabbie, in central Gippsland, were not yielding to their potential. With average winter rainfall of 350mm he says soils, not water, appear to be limiting growth. His scholarship was sponsored by Rural Finance, allowing him to visit to visit leading farmers and soil researchers in the United Kingdom, US, Canada and New Zealand.

He found crop rotations were considered the most influential management tool to improve soil structure and increase yields, and to control weeds and disease, particularly in the US where he visited farmers in Kansas, Oklahoma and North Dakota.

“One of the most consistent findings around the world is that the best wheat crops are grown after legume crops. Farmers in the drier regions of the US said that after they started growing corn their wheat yields improved. Their best wheat was grown after corn followed by field peas.”

He says just as people and animals need a balanced diet, so do soils. He believes feeding soil microbes a variety of crop residues will improve soil and plant health.

The prevalence of no-till and controlled traffic systems among leading growers has also confirmed for him that he is on the right track introducing these systems at Toongabbie, and he’s “about half-way there”.

“I can see some areas where I can be doing better, and I have some emerging problems with root diseases and weeds. Based on what I’ve seen during my scholarship I think improving my rotations with a four or five-year outlook and more diverse rotations will be the key to improving soils and managing these problems better.”

In the US Mr Morris also saw continuous cropping in regions that had summer rainfall similar to that of central Gippsland, which averages about 250mm from November to March. On returning home he established a trial growing corn, sorghum, soybeans and sunflowers and despite a dry summer (15th percentile) in Gippsland so far the trial crops are doing okay.

Even if not as profitable as winter cropping, Mr Morris expects there will be longer-term benefits from summer cropping, including improved weed control and disease management and better soil structure as many summer crops have a more vigorous root systems than winter crops.

During his Nuffield travels in England he visited two research trials that have made a lasting impression. One is a long-term fertiliser trial at the Rothamsted Research Station where there are two plots that have been continuously cropped with wheat for 150 years. One plot has been fertilised with manure every year and the other plot has not been fertilised at all.

“The contrast was remarkable. The manured crop was outstanding and the unfertilised crop looked like it was struggling to survive drought conditions. It hammers home the point about getting fertiliser right,” he says.

The other was a “park grass experiment” on a site managed by the Rothamsted researchers since 1856. Different plots within a field of grasses are treated with different fertiliser regimes during the year, and the field is cut for hay. Mr Morris says the site is not otherwise cropped or replanted with any particular grass species, and no weed control is undertaken.

The original aim was to identify how different fertiliser regimes affected hay yields. However, it also showed how treatments affected the composition of grass and weed species, with clear differences according to the treatments used. Mr Morris says this experiment has raised questions in his mind about how his fertiliser practices are changing soil chemistry, and how this is affecting the weed burden on his property, but he has been unable to find local research on the issue.

He describes the soils on his property as variable duplex clay loams over clay, ranging from 4.2pH (calcium chloride) to 4.7pH on his best soils, which have benefitted from applications of lime and gypsum. But he is aiming to raise this to 5.5pH, and to increase average cereal yields from around 3t/ha to 5t/ha.

Mr Morris says his Nuffield Scholarship gave him the opportunity to spend time with leading farmers and their attitude and encouragement has made a big difference to his confidence and focus. He has also picked up “a million little things” along the way that he wants to try out on the farm.

“I can also see more clearly the benefits of doing things on time, and putting more resources where they’re going to have greatest benefit – like more timely weed control, and achieving 100 per cent control.” He points to the example of two New Zealand grain growers who made the *Guinness Book of Records* in consecutive years with wheat crops of more than 15t/ha, claiming all they did to achieve these yields, was to “follow the rules” of agronomic best practice.

For more information contact Ben Morris on 03 5148 9077, mobile 0421 987 486, email benmorris@nuffield.com.au

A high-resolution photograph of Mr Morris can be downloaded from www.coretext.com.au/communications_images.php

Please contact Catherine Norwood at Coretext Communications (03) 9670 1168, cnorwood@coretext.com.au if you have any problems accessing images.

Caption: Victorian Nuffield Scholar Ben Morris inspects a commercial sorghum crop in Kansas, and says sorghum has potential in Gippsland, to increase crop diversity and improve soil structure.