Reducing fertiliser costs with composts and manures in strawberry and other crops

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- Preliminary results from an ongoing trial in the strawberry nursery sector show that soil amendment with composted or pelletised chicken manure can reduce fertiliser requirements by 30-60%
- This project is developing a web and smart phone application (app) to calculate the nutrient benefits of different sources of manures and composts, and how to integrate their use with fertiliser programs

Australian crop producers will soon be able to better calculate the release of nutrients from organic amendments into soil to reduce fertiliser rates and costs without sacrificing yields.

A team led by the Queensland University of Technology (QUT), in conjunction with agronomists and researchers from La Trobe University, Deakin University and the University of Queensland, is developing a web and smart phone application (app) that will allow growers to calculate the nutrient benefits of different sources of manures and composts, and how to integrate their use with fertiliser programs.

The Department of Agriculture's Smart Farming Partnerships Program and Meat and Livestock Australia, together with a consortium of farming, composting and state government project partners are funding the $3.5 million research project.

There is growing knowledge on the benefits of organic amendments for soil health, but there is little support for growers on how to capture the nutrient value of these products in specific crops and regions in a cost-effective way. It can be confusing for growers and agronomists because the age, composition, and decomposition rates of different organic amendments strongly influence the amount and timing of nutrients they release into soil. The app will allow growers to account for these variables very easily and more accurately.

The project team are conducting farm and laboratory trials in strawberry (Figure 1), vegetable, cotton, broadacre cropping, and pastures in nine diverse production regions across Australia using 15 broad classes of organic amendments to support the development of the app.

Preliminary results from an ongoing trial in the strawberry nursery sector show that soil amendment with composted or pelletised chicken manure can reduce fertiliser requirements by 30-60% without affecting early growth of mother plants (e.g., Figure 2). Research in the trial is also accounting for losses of gaseous nitrogen and carbon, and the distribution of nutrients through soils to maximise yields for growers and minimise unwanted impacts on the environment. Results currently show that the combined use of high rates of organic amendments and fertilisers can dramatically increase losses of nitrogen in the form of nitrous oxide to the atmosphere (Figure 3). Therefore, it is vitally important that growers get a better balance between the application of organic and fertiliser inputs, so they don't waste money from nitrogen losses to the atmosphere. The development of the app will help growers better achieve this balance.

Figure 1. Field trial at Toolangi, Victoria evaluating the ability of different forms of chicken manure for offsetting fertiliser inputs in the production of strawberry runners. Automated chambers at the site continuously measure the release of gaseous forms of nitrogen and carbon from soils. Data from the trial will help support and validate the development of an app that will allow growers to better calculate the release of nutrients from organic amendments such as chicken manure. Photo credit: Scott Mattner

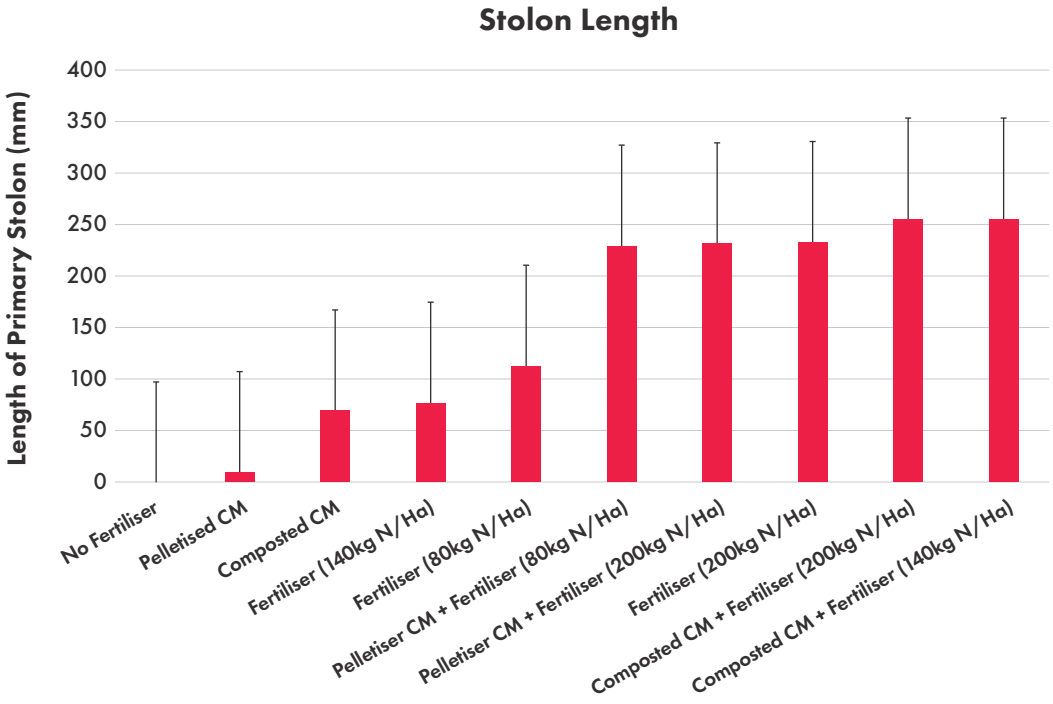

Figure 2. Average length of the primary stolon (runner) of strawberry mother plants (cv. Red Rhapsody, 2-months after planting) in plots treated with different forms of chicken manure (CM) and rates of synthetic fertilisers in a field trial at Toolangi, Victoria. Other parameters of strawberry plant growth (crown diameter, leaf number, stolon number, chlorophyll content) showed similar responses to the treatments as stolon length. The bars represent the least significant difference (P=0.05), which allow statistical comparisons between treatments.

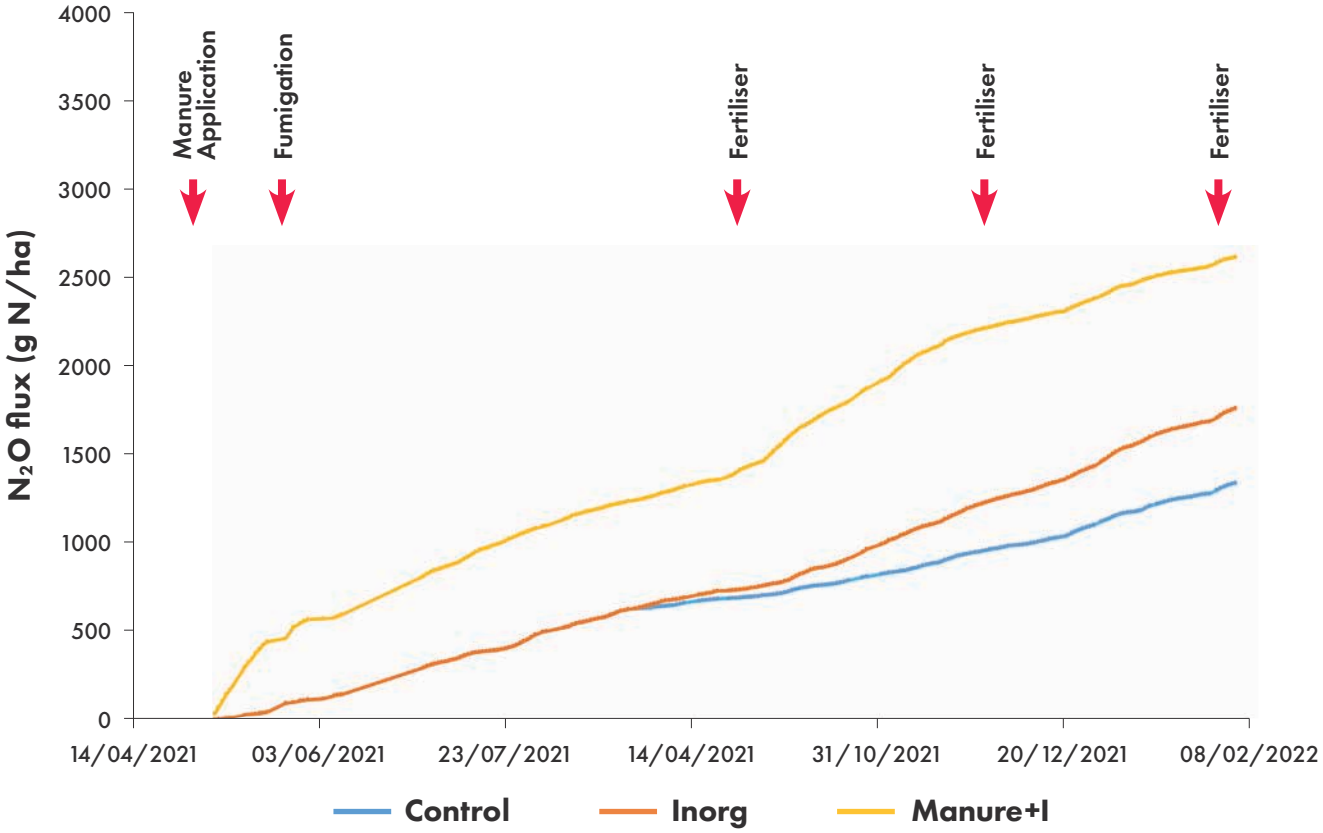

Figure 3. Emissions of nitrogen lost to the atmosphere in the form of gaseous nitrous oxide (N2O) from soils treated with chicken manure and synthetic fertilisers. Control = no fertiliser (blue line), Inorg = fertiliser (200 kg N/ha) (orange line), Manure+I = composted chicken manure and fertiliser (200 kg N/ha) (yellow line).

Grower evaluations of the app will commence shortly, followed by demonstration days and workshops on managing organic amendments in each region. Results from strawberry trials will be updated in later issues of the Australian Berry Journal.

Growers can follow the progress of research in the project on:

@UnlockSoilOAs

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