

Editorial

Where agricultural research goes wrong and what we can do about it

*A*t the UTAR Agriculture Technology Seminar in November 2015, one of the speakers described how he cured an oil palm tree of basal stem rot disease by scraping off the rotten tissue at the base of the palm and drenching the wound and surrounding soil with wood-vinegar. The tree produced new roots and commenced to bear fruits again. He apologised that his experiment was not scientific and hoped a scientist would do the necessary research to make it scientific.

At one time, a scientist would have fitted such an appeal for research into his or her work programme with little or no formality. This is unlikely now because experiments have become bloated and expensive and scientists expect to be generously funded for any research they do. Consequently, those who need research urgently must learn how to do it themselves without help from the scientific establishment.

A typical ‘scientific’ experiment on oil palm would require a large number of trees, some to be given treatments in various ways and some to be kept as untreated ‘controls’. You need large numbers for calculating means and standard deviations in order to determine the level of statistical significance between treatments and controls. This is how experiments get bloated and expensive. The fallacy has been promoted for decades that with a good experimental design, the results cannot be disputed and confirmation by repetition becomes unnecessary. This fallacy was exposed a few years ago when the retired director of a pharmaceutical company revealed in the journal *Nature* that a high proportion of published findings in the best peer-reviewed medical journals could not be independently confirmed by scientists in his company. This tells us a few things. Firstly we cannot trust anything published in a scientific journal without further verification. Secondly, all research claims have to be verified, no matter who did it, and whatever the methodology used, before they can be accepted as true. Research methodology, peer review, and the reputation of the journal cannot guarantee reliability.

It is in the nature of any problem that needs research, that the solution is not obvious. If you are wrong with one palm, you learn and use the experience in planning the next experiment. If you are wrong with 100 palms in one big experiment, you may never recover from the disaster. We expect scientists to love doing experiments. Instead what we often detect is reluctance to experiment, due to fear of failure!

I once spoke at a conference of editors of medical journals and criticised the expensively bloated nature of most research and how editors may have contributed to the rot. I was met with silence. Then at lunch I happened to sit next to a person who told me quietly that he agreed fully with me. Surprised, I asked him what he did in medicine. He was a surgeon. In surgery you can only operate on one patient at a time, and learn from it.

If you can solve a problem and can confirm through repetition that your method works, you can claim the honour of scientific discovery, by publication. You do not need to be a certified scientist.

Francis S.P. Ng