

Let the World Learn From Our Experience with GMOs

Written by Dr. E. Ann Clark

E. Ann Clark is an Associate Professor in the department of Plant Agriculture at the University of Guelph, Ontario, Canada. She wrote this piece in response to a widely reported survey which suggested UK farmers wanted to grow GMO crops (1). The first paragraph refers to the fact that the 30 farmers questioned for the survey were selected from a list provided by SCIMAC (the Supply Chain Initiative on Modified Agricultural Crops). In their own words, "SCIMAC is a grouping of industry organisations along the UK farm supply chain, established in 1998 to support the carefully managed introduction of GM crops in the UK." It is written as an open letter to British farmers and others considering growing GMO crops.

As I tell my students, how you frame the question predetermines the range of possible answers. This article demonstrates the corollary: how you pick your survey respondents predetermines the outcome. Did the authors of the research - Professor Andy Lane and Dr Sue Oreszczyn - actually intend their findings to be released now, or was it an inadvertent disclosure? Perhaps this small and patently selective sampling of farmer opinion - 30 'large-scale, commodity farmers -- not those mainly involved in organic growing' - was just a preliminary effort, to be followed up by a larger, statistically sound sampling? Or perhaps all British farmers are large-scale commodity growers, such that this small group could be considered representative?

I can certainly sympathize with British farmers about the difficulty of getting good, unbiased production advice in a vacuum of government extension support. Canadian farmers are in the same boat, if that makes you feel any better.

But what I cannot fathom is how British academics can still be quoted as saying that GM crops allow farmers to grow "high-quality food profitably", in an "environmentally sensitive way", and to attain "high yields while using less herbicide".

Perhaps they were misquoted. Roughly 99% of GM land on the planet is sown to just two traits - herbicide tolerance (HT) and Bt, which causes plants to synthesize their own insecticide. Nothing about quality.

Objective evidence of profitability is equally sparse, particularly if one factors in the lemon effect of lost markets due to the global rejection of GM. British growers might want to look for an article by Mauro and McLachlan (2008) when it comes out in the journal *Risk Analysis*. This is the first ever publicly available survey, in a peer reviewed journal, of how Canadian farmers have been impacted by GM technology. It includes a quote by a Canadian farmer, who said "The loss of [European] markets due to GM had a huge financial impact. This was likely larger than the cost of controlling volunteers or benefit of easy weed control".

This same 2003 survey of 370 farmers found that the greatest cited benefit among technology users (n=298) was operational, including timing and efficacy of weed control, facilitating farming of a larger landbase. Among 10 ranked benefits, **increased yield was 6th** and **increased revenue ranked last**. Among 10 cited risks, of greatest concern were loss of markets, loss of farmer rights under the Technology Use Agreement, higher seed costs, and lawsuits. Remember Percy Schmeiser? (2)

So how about yield? Pay attention, British growers, to a recent USDA retrospective on GM in the US, which stated “Currently available GE [genetically-engineered] crops do not increase the yield potential of a hybrid variety. In fact, yield may even decrease if the varieties used to carry the herbicide-tolerant or insect-resistant genes are not the highest yielding cultivars.” (Fernandez-Cornejo and Caswell 2006). Likewise, researchers with Agriculture and Agri-Food Canada (AAFC) summarized the Canadian experience with GM crops. Beckie *et al.* (2006) cited a 2-year AAFC trial over 5 western Canadian locations where HT outyielded conventional canola weed control practices in just 6 of 30 contrasts, all occurring at sites and years of particularly problematic weeds. They also cited evidence from public variety trials in Ontario, where much of the Canadian corn and soybean are grown, showing not an increase but a 4% yield **decrease** in GM soybeans and the absence of yield benefit from GM corn. So, let's stop with the 'higher yield' mantra and stick with the scientifically defensible evidence. Somebody might as well learn from our experience.

Less herbicide? Environmentally sensitive? As of 2008, a total of 63 weed biotypes spread over 13 species are now tolerant to glyphosate, the active ingredient in Monsanto's Roundup Ready herbicide. Of these, 41 were detected in soy or cotton fields starting in 2000 (www.weedscience.org). Of the 41, 32 were reported from the US, with the rest predominantly from Brazil and Argentina, paralleling global use patterns of HT technology. The evolution of weed resistance in GM crop fields has increased - not decreased - rate and frequency of application of herbicides, and obliged tank-mixing with other herbicides to cope with intractable weeds. According to Benbrook (2004) we now use more - not less - herbicide.

So if it doesn't actually do what was promised - apart from simplifying the process of weed control, then why are so many North American farmers growing GM crops? Beckie *et al.* (2006) reported that planting choices for western Canadian canola producers had simplified down to one non-herbicide tolerant (HT) cultivar and 48 private sector HT cultivars, (mutagenic as well as transgenic (3)). Was this because they were all so pleased with what HT is doing for them, or was it just safer than becoming the next Percy Schmeiser? Next time British farmers or policymakers hear that 95% of western Canadian canola plantings are HT, they might want to ask themselves if this is a fate they want for themselves.

Footnotes

1) e.g. <http://www.sciencedaily.com/releases/2008/02/080224080948.htm>

2) Percy and Louise Schmeiser are Saskatchewan canola growers and seedsavers. Monsanto alleged patent infringement when the RR gene was found in some of the canola plants on their land. All allegations of theft or ‘brownbagging’ were withdrawn at the outset due to lack of

evidence. The case went to the Supreme Court of Canada, which reached a split decision, as explained in <http://www.plant.uoguelph.ca/research/homepages/eclark/percy.htm> and <http://www.plant.uoguelph.ca/research/homepages/eclark/pdf/sc.pdf>

3) Herbicide tolerant crops have been generated through both mutagenenic and transgenic methods. Mutagenized HT crops include those tolerant to imidazolinone (IMI), while transgenic HT crops include those tolerant to glyphosate (e.g. RR), glufosinate ammonium (e.g. LL), and bromoxynil (BX)

References

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