**No-Till Take-Homes from Groundswell 2019**

**John N. Landers[[1]](#footnote-1)**

1. The event was exceptionally well organised in a farm setting, with plenty of machinery demos and talks on a wide variety of relevant topics, to assist farmers to absorb the new paradigms of this innovation;
2. Visitors came from Norway, Denmark, Sweden, Germany, France, Brazil, USA and eveen India. JOHN ADD MORE?
3. Groundswell attendance is steadily growing, approx. 1500 this year - in Brazil, we peaked at 3000 at the pnnacle of adoption. We now have some 35 million hectares in No-till, but with dominance of the soybeans/maize succession with abundant grass undersowing in the second crop maize;
4. No-Till/ (Zero Tillage) is expanding fast in UK because pioneer farmers have shown very positive results (Tony Reynolds,Lincs, Simon Cowell, Essex,, Will Scale, Camarthen, and John Cherry, Herts, to name a few);
5. There is a huge awareness of soil health as a basic concept. And scientists are experimenting with different indicators but no single measure suffices – there will possibly have to be a separate evaluations for NT and conventional cultivations;–
6. Joel Willliamson on alerted to the fact that root biomass is a more important contributor to soil organic matte (SOM) and crumb structure than above-ground biomass - root biomass needs a rapid assay technique;
7. Simon Cowell (Essex) related how he makes compost with horse manure plus roughage and inoculates this from soil where field margin species are most vigorou, indicating high biological activity. He makes the compost in a high windrow, which he turns over with some angled discs to prevent overheating;
8. Mixed cover crops are being quite widely used and several seed firms are actively marketing seed of cover crops and herbal leys;
9. Paul Roberts-Thomson (Tasmania) uses mixed cover crops and reckons there are incremental gains up to about 20 spp.– his take is that 8 spp. is better than 4spp. and 16 is better than 8 spp., although there are diminishing returns and for him 16 spp. seems a good cost-effective balance, because the seeds are expensive. Own production of seeds is a solution;
10. Frédéric Thomas (France) reckons French farmers are ahead of the Brtishsh in terms of soil health and encouraging biological activity in soils and his slides were impressive;
11. Biological controls in UK concentrate on encouraging on-site predators rather than introducing them from outside, as is done in Brazil, with parasitic wasps for caterpillars and shield bugs and insect disease inoculation (i.e. Beauveria, Nomuraea and Metarrhzium) for various pests. The uso f the antagonic fungus Trichoderma as a seed dressing is now common in Brazil but rare in UK, it sems;
12. Significantly, the 3 finaists in the “Soil Farmer of the Year“ contest all used NT leys in their rotations, so it appears that No-Till is triggering a renaissance of Ley Farming – the name comes from old English “lea “ or meadow. NB this totally appropriate term has beeen falling into disuse;
13. British farmers are ahead of Brazil in the adoption level of crop diversity (the third principle of Conservation Agriculture) - in Brazil, most of the 35 million hectares of No-Till are devoted to the soybean/maize succession, with diversity very low for the first crop, soybeans – in the second crop, mostly maize, diversity is aided by a short ley undersown in the maize, for cover, nematode control or pasture, sorghum and millet as covers now have a minor role – in the tropics this allows three crops a year, the ley is usually about six months, or less.;
14. Sam Lane from Cotswold Seeds made the following comments :
	1. The principal function of a modern ley is to restore fertility on overworked arable soils, especially by increasing soil organic matter;
	2. A secondary function is improving soil texture and workability, to reduce cultivations and improve seedbeds (not relevant to No-Till);
	3. Thirdly, leys of 2-3 years are being used for weed control, especially of Blackgrass;
	4. For my information, he explained that ley farming is concentrated more in the dairy farms of the Sothwest and West, in East Anglia , arable is king and there are few cattle, but leys and cover crops are now increasing in rotations over the UK;
15. Because of the need to reduce costs and the new NT mindset, No-Till farmers are reducing chemical use drastically, including glyphosate and insecticides, the former due to a lower weed seed bank and the latter due to encouraging natural predators and close monitoring of their control potential;
16. In the Glyphosate debate, Frédéric Thomas made the point that Glyphosate, as a trigger to NT viability, has been hugely positive in increasing world food production and soil health, thus minimising environmental impacts on and off-farm and elevating the level of agricultural sustainability – this includes significant quantities of carbon sequestered by increasing soil organic matter;
17. Frédéric further exhorted participants to clebrate the success of Glyphosate and the NT system and not to be defensive about its use;
18. I pointed out several possible substitutes for pre-plant desiccation viz :
	1. the “Electroherb” Brazilian machine which electrocutes weeds and their roots with a 6000volt shock (it is too expensive except fotrotganic farmers;
	2. the University of Gøttingen in Germany has discovered a Cyanobactrium which secrets a herbicide equivalente to Glyphosate – this will take some time to develop commercially;
	3. In UK, a laser weed killer machine is being tested;
	4. And modern guidance systems could be used for inter-row cultivation with a rotating, ground driven, horizontal disc - provided the residue is not too heavy or chopped, this rotation makes the disc self-cleaning.
	5. Knife rollers or roller-crimpers are only effective on some covrr crops at a specific stage of growth (milk stage for Black Oats);

So, even if Glyphosate be banned in 2022, No-Till will overcome.

1. Allan Savory’s insistence on bringing livestock back to the rotation is based on the fact that dung and urine re-cycle pasture into soluble nutrients and trigger high biological activity, a basis for natural sustainability;
2. No-Till//Zero Tilllagee has not yet been mainstreaned in UK university curricula. This is not only due to a conservative atitude towards radical innovations, but also, lecturers will have to re-write all their lecture notes, with no extra pay;
3. Earthwlrms are a symbol of healthy soils and rresearchers are delivering tools to measure their populations;
4. Root exudates control the rhizosphere and can have the following functions:
	1. Nutrition of useful soil microbes;
	2. Glue to form soil aggregates;
	3. Nutrient solubilization (especially P);
	4. Allelopathy - herbicides suppress similar spp.;
	5. Attraction of rhizobia and mydorrhiza;
	6. Control of soil-borne diseases;
	7. Pest repellants.

However, not all these functions are found in one plant and that is the benefit of mixed herbal leys and cover crop mixes.

Although our Brazilian esxerienc may not be directly applicable to UK farming, I hope that some of the principles illustrated can contribute to progress by encouraging out-of-the-box thinking. If I can contribute in this way, it will give me great satisfaction to (partly) retribute this country for an excellent education.

1. OBE, a graduate of Reading (1961) and Zero Tillage pioneer in tropical Brazil since 1976 and founder of the ZT Farmers’ Association for the Cerrado (tropical savannah). region. His talk on “Zero Tillage in Ley Farming : A Possible bonus after adopting ZT”, showed the higlights of the 12 million hectares of ley farming in Brazil, with some important priciples of wide application. [↑](#footnote-ref-1)