The Rt Hon Caroline Spelman MP
Secretary of State for the Environment, Food & Rural Affairs, DEFRA

The Rt Hon Andrew Mitchell MP
Secretary of State for International Development, DFID

The Rt Hon Chris Huhne MP
Secretary of State for Energy and Climate Change, DECC

Elterwater, July 2010

Zero Tillage: an Urgent Opportunity for the New Government

Dear Ministers

British policy on agriculture, at home and abroad, was made at a time when world food supplies were considered secure. We now know that food supply cannot be taken for granted because of declining soil fertility, competition from biofuels and vulnerability to climate change. In the next two years, the new government faces three major challenges: DEFRA will renegotiate the CAP; DFID must decide how to respond to world food crises; and DECC will negotiate international deals on CO_2 reduction.

There is growing international experience with new farming methods of zero tillage that improve soil health and allow high levels of food production to be sustained with reduced inputs, flooding, soil erosion, pollution and CO_2 emissions and with improved water retention and biodiversity. Over half of Brazil's food production now uses zero tillage systems and it is expanding in Canada and Australia. A small group of UK farmers have shown that it can work well in the UK.

In view of the severity of the problems, the availability of solutions and the opportunities for public intervention, we strongly recommend that the new British Government:

A. Appoints a staff member of DEFRA to investigate zero tillage with a view to including it as a central feature of the new CAP.

B. Appoints a Zero Tillage Champion in DFID to promote and report on zero tillage activities undertaken with the core funding it provides to the CGIAR and to multilateral institutions.

C. Investigates opportunities for international financing to support zero tillage on the margins of rainforests and on degraded lands, as a means of reversing deforestation.

D. Allocates a research and dissemination funding stream managed jointly by DEFRA, DFID and DECC and undertaken with the private sector, to be dedicated to scientific and technical progress, including on-farm research, information exchange and evaluation.

Yours faithfully

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Restoring Soils for Future Food Supply

British policy on agriculture, at home and abroad, was made at a time when world food supplies were considered secure. We now know that food supply cannot be taken for granted because of ongoing decline in soil fertility, competition from bio-fuels and vulnerability to climate change. In the next two years, DEFRA will renegotiate the Common Agricultural Policy, DFID must decide how to respond to world food crises and DECC will negotiate international deals on CO_2 reduction. There is growing international experience with a new farming technology – zero tillage – that improves soil health and allows high levels of food production to be sustained with lower inputs, less pollution and greater biodiversity.

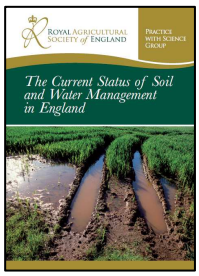
A. The Problem

To produce enough food to feed the world whilst maintaining soil and water resources.

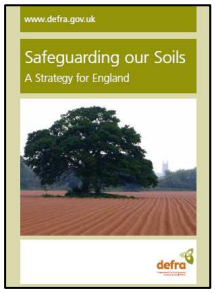
'There is an intrinsic link between the challenge we face to ensure food security through the 21st century and other global issues, most notably climate change, population growth and the need to sustainably manage the world's rapidly growing demand for energy and water … This threatens to create a 'perfect storm' of global events." John Beddington, UK Government Chief Scientist.

There are plenty of political statements.

'We need to produce more food without damaging the natural resources – air, soil, water and marine resources, biodiversity and climate – that we all depend on.' and *'Food production needs to make sustainable use of natural resources: reducing and being more efficient with man-made inputs, like … chemical fertiliser … using better land management or cultivation practices, to allow for wider benefits of protecting and enhancing soil, water and wildlife …'* HMG, Food 2030.

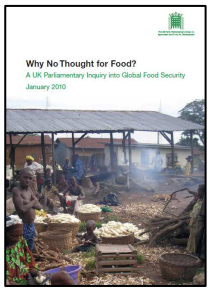


'Farmers in England, who manage 72% of the land, face the challenge of increasing yields while at the same time reducing inputs, improving soil health and generally enhancing the environment.' RASE, The Current Status of Soil and Water Management in England.

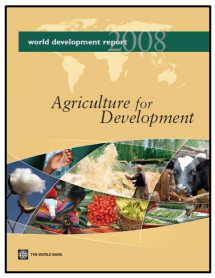


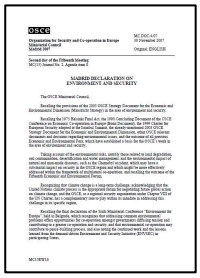
'Soils in England continue to face three main threats: soil erosion by wind and rain; compaction of soil; organic matter decline.' DEFRA, Safeguarding Our Soils, 2009.

'Given our dependency on food imports, the UK is not immune to the potential impacts of its declining investment in agricultural research and development at home and abroad.' and *'2010 presents a historic opportunity for the UK to seize the initiative, mark a break with past DFID policy, and help set the agenda for the coming decades in the fight against hunger.'* All Party Parliamentary Group on Agriculture and Food for Development - Why No Thought for Food? Jan 2010.



'Agriculture continues to be a fundamental instrument for sustainable development and poverty reduction' and '*it is time to place agriculture afresh at the center of the development agenda'.* World Bank, World Development Report 2008 – Agriculture for Development.

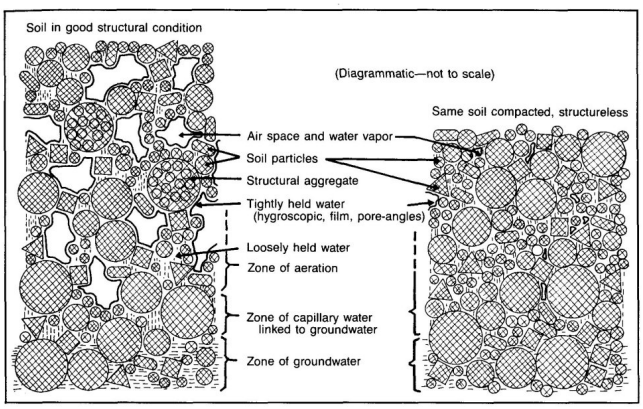




'Environmental degradation, including both natural and man -made disasters, and their possible impact on migratory pressures, could be a potential additional contributor to conflict.' OSCE Madrid Declaration 2007.

These policies turn a blind eye to the critical problems caused by soil degradation, to the severity and causes of the problem and to possible solutions.

There is little sense of urgency and of the large areas of land where soil degradation is becoming irreversible. Soil erosion and compaction is created mainly by ploughing but the word 'plough' does not feature once in any



of the above policy documents.

The policies refer ubiquitously to 'sustainability', a comfort word that now has little meaning. Policy is dominated by a paradigm that assumes that we must rely on improvements to our current production systems and accepts radical solutions only as niche initiatives.

Environmental policies are designed almost exclusively for the promotion of biodiversity and the prevention of pollution and many policy makers still see farmers as the enemy.

Research is dominated by the search for high-tech solutions to individual problems that expect to save our soils by improving our current systems of production. There does not appear to be any strategic thinking about different options for improving soil management.

But there are new farming practices that avoid ploughing and will feed the world for the foreseeable future.

'Management of soil health thus becomes synonymous with management of the living portion of the soil to maintain the essential functions of the soil, to sustain plant and animal productivity, maintain or enhance water and air quality, and promote plant and animal health.' (Trutman, 2000. TropSCORE website).

Ploughing has long been considered an essential method of controlling weeds and preparing a good environment for seeds and roots. But it also causes huge damage to the soil and new practices have been developed for managing the soil and that can be adapted to a wide variety of conditions. Zero tillage:

- improves soil organic matter, soil porosity and the life of soil organisms and reduces the effects of compaction
- improves availability of plant nutrients whilst using less fertiliser
- controls weeds and pests with fewer agrochemicals, provided that intelligent targeted techniques are used
- improves water absorption and groundwater recharge which reduces runoff and flooding
- reduces labour/tractor inputs
- reduces greenhouse-gas emissions from the soil and reduces farm fuel use
- enables current yields to be sustained in the long term, thus reducing deforestation and releasing land for biofuels
- reduces costs and increases profits

Switching to zero tillage could save the world about £ 14,700bn a year

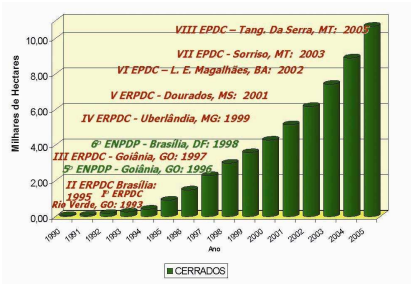
Source of savings	£bn
On-farm margins	7,200
Reduced irrigation costs	700
Reduced flood damage	900
Slower silting of reservoirs and ports	300
Increased aquifer recharge	3,600
Net carbon gains	2,000
Total savings from zero tillage	14,700

Notes: farm margins and physical parameters based on Brazilian and UK experience; silting costs valued at market rates for dredging; aquifer recharge measured at virtual water costs less groundwater extraction costs; carbon gains valued at world carbon trading prices.

B. Solutions

The majority of Brazilian farmers now grow crops without ploughing.

Many of Brazil's soils are fragile and crop yields have declined with soil compaction, exhaustion, sterilisation and erosion.



Over the last 15 years zero tillage has grown to over half the cultivated area. As a result, Brazil is now increasing food production whilst also improving soil organic matter and fertility and reducing runoff and erosion. All with public spending at about 10% of EU levels.

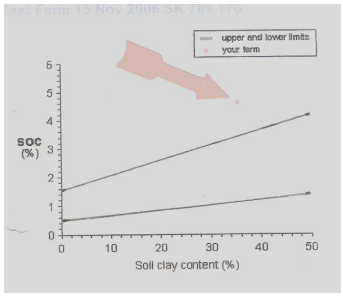
But this has all required substantial promotion, first from networks of farmers groups and then from government.

Zero tillage is also growing in Australia, the USA, Canada and other countries.

Conservation Agriculture worldwide 117 Million ha

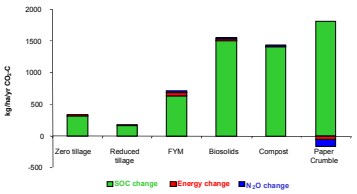
There is wide interest among UK institutions and success from trend-setting farmers.

There is now a small group of UK arable farmers who have shown that zero tillage works. After an initial drop, yields recover over several years while the soil is rebuilt. Profits recover sooner, as costs are lower. Soil organic matter contents are typically over twice the national average. A 600 acre arable farm can be managed with one tractor, a no-till seed drill, a combine and a sprayer. Some weeds and pests create specific challenges but the health and diversity of soil biota help reduce the incidence of weeds and maintain a reserve of predators. Improved soil life and cover has a dramatic effect on birds and other wild animals.



Cranfield University has been influential in developing zero tillage equipment. Rothamsted has researched the CO_2 impact of tillage practices, showing that savings can be made, but that more research is needed into nitrous oxide. In Europe, ECAF promotes zero tillage - www.ecaf.org.

CO_2-C 'savings' from reduced tillage and organic material additions



The main international research institutes are promoting zero tillage.

Most of DFID's limited support for agriculture goes to the CGIAR international network of research institutions. FAO, CIRAD, ICRAF, CIMMYT, ICARDA and ICRISAT all promote zero tillage, including mulch cover and crop diversification.

Local manufacturers of zero tillage equipment are expanding products and sales in many countries, at various scales. FAO is active in supporting the full range of local manufacturing and marketing business.

In India and Pakistan, zero tillage for wheat plays a crucial role in maintaining soil quality and water retention and in controlling weeds and pests, with support from the Rice-Wheat Consortium (CIMMYT, IRRI, ICRISAT, IWMI and CABI), many donors (including DFID), national research institutions and the farming industry (www.fao.org/ag/ca) Adoption is growing amongst commercial farmers, but small risk-averse farmers need more support.

As part of CIMMYT's Global Programme for Conservation Agriculture, IFAD is funding programmes for zero tillage in West and Southern Africa.

C. Actions

An international approach is needed.

The principles and benefits of zero tillage are universal, but the practice needs to be adapted to local conditions. Exchange of experience is invaluable to this adaptation. This exchange should cover technical solutions, institutional arrangements and government incentives.

The EU is lagging behind other countries and can benefit from their experience. Despite the neglect of recent decades, there is still a strong agricultural skills base in the UK and we can provide important support to other countries.

Government support can include common features that are consistent with world trade rules and benefit from shared experience.

Zero Tillage provides an ideal focus for government support in the new CAP.

The current CAP lasts until 2013 and major reforms will be negotiated. With increased pressure on the EU budget, it will no longer be politically acceptable to make payments to farmers that are related to historical payments and conditional only on relatively undemanding compliance measures. But, World Trade agreements will prohibit direct payment for production. Support for zero tillage provides the ideal opportunity to pay for the environmental benefits which derive from improved soil health, without accepting reductions in food production.

A Zero Tillage Conversion Scheme should build on experience with higher tier agri-environment and the Organic Conversion Scheme. Schemes in other countries (eg Canada and Brazil) should be reviewed.

In South America, Zero Tillage provides further benefits from reduced deforestation.

International funding is already provided for 'REDD' schemes that reduce deforestation. Zero Tillage is being used in some areas to help farmers rehabilitate degraded pastures, so that cattle herds can be maintained without further deforestation. This gives global environmental benefits that merit international funding.

Existing initiatives in developing countries need sustained support.

DFID has opportunities and responsibilities to exercise the leadership role that it enjoys in the international development world and the leverage it enjoys through its core funding to the CGIAR and to multilateral institutions, including DG8 in the EC, the WB, IFAD and the Asian and African Development Banks. DFID should support existing initiatives, including:

- The significance of zero tillage in the agricultural programmes of the EC, WB, IFAD, AfDB and AsDB
- The Rice Wheat Consortium and the Sustainable Rice Intensification initiative.
- CIMMYT's Global CA Programme
- FAO's experience with conversion pilots
- Growth of local equipment manufacturing

There are also opportunities for increased international discussion and research.

Experience in Brazil, Australia and Canada shows that farmer cooperation is at least as important as public support. Very low levels of public funding can facilitate influential cooperation, by funding expenses and facilitation for discussion forums designed to exchange farm experiences, both within and between countries. Modest funding for international networks (ECAF and PACA, RELACO, CAAPAS, ACT and SACAN) will be very influential. National institutions (like ABPD, APPRESID, CASA, CAAANZ, WANTFA) would benefit greatly from international exchange. In the UK, the Soil Management Initiative, the UK No-Till Alliance and the Tropical Agriculture Association provide a sound basis from which to support exchange of experience.

Zero tillage depends on continual updating and adaptation of techniques, especially for weed and pest control. It uses agrochemicals in a more selective way than conventional farming, but their use is critical to success. Farmer innovation needs to be supported with science.

Finally, public funding for research is needed to understand better the impact of zero tillage on the environment, on emissions, on biodiversity and on the rural socio-economy.