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23rd April 2009 "Food, Flora and Fauna Can Land Managers Deliver?"

Signed: Peel H Holroyd Chairman RAC 100 Club

Dated: 23 April 2009

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THE ROYAL AGRICULTURAL COLLEGE

and

THE ROYAL INSTITUTION OF CHARTERED SURVEYORS

100 Club Annual Fellowship

in

Rural Land Management

Report No.3

23 April 2009

**‘Food, Flora and Fauna
- can land managers deliver?’**

Mr Mark Hudson
(Chairman Game & Wildlife Conservation Trust)

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Mark Hudson

27th March 2009

Rhyd-y-Cilgwyn
Denbighshire

Executive Summary

1. It is becoming increasingly likely that, without major advances in technology, global food production will fail to keep pace with a continuing growth in population. Furthermore a declining stock of farmable land, significant climate change and a likely water deficit in many areas will hamper improvements in crop and livestock product outputs without significant scientific research.
2. Changes to global climate and the pressures on land use will also make protection of landscapes, habitats, flora and fauna increasingly difficult. Hard decisions will have to be made.
3. In the UK there has been an extensification of stocking rates and a decline in arable cropping since 1985. At the same time the rate of increase in most crop yields has declined.
4. The Cabinet Office report of July 2008 (“Food matters – towards a strategy for the 21st Century”) failed to acknowledge the role played by farmers as food producers. Some of the key visions from the Curry Commission Report of 2002, especially utilizing the benefits of new technology, are still unfulfilled.
5. The decline in crop yield increases possibly stems from a number of causes including the move from production support to area payments, declining research and development, reduced use of both fertilisers and pesticides, the increased interest in conservation and, perhaps, a slackening of entrepreneurial innovation.
6. Without harnessing the results of scientific research, and in particular the use of well researched and tested genetic modification, there is a severe danger that not only will food output become increasingly inadequate but wildlife and the wider environment will also suffer.
7. Governments will need a clear long term vision that its populations will have to approve and make work. Whilst there is a role for centralised direction, the best people to deliver the outcomes required are those who work and live in the countryside. Given both new guidance and opportunity, land managers with the right balance of incentive and an underlying level of support can, with the help of science, deliver the goals in both food production and environmental security.
8. To achieve this will require a significant change in attitude from all those involved. Governments will have to consider the long term view, land managers

should accept responsibility for delivery and the population will have to be persuaded that a basic level of support for land managers and an increase in scientific research are essential for the success of achieving both food and environmental security.

9. The use of SPS funds after 2012 should be reviewed. Payments for cross compliance and ELS/Tir Cynnal payments should be reduced allowing greater support for higher level agri-environment schemes and the hills; introducing new elements for research; new entrants/young farmers; marketing and the food chain; and support for market failure.

Introduction

Ten years ago in 1999 the Game and Wildlife Conservation Trust (then the Game Conservancy Trust) published “A Question of Balance (Game animals and their role in the British countryside)” – its first comprehensive policy document. This was a seminal piece of work and should be on the bookshelves of every land manager in the UK. Although “A Question of Balance” was a conservation plan based on scientific observation, it did not ignore the role of food production and draws widely on the experience of the Trust’s Allerton project based at its farm at Loddington in Leicestershire. Indeed the conclusion of that chapter is worth repeating in full – “Many see the needs of farmland wildlife and the maintenance of biodiversity as incompatible with profitable farming. In just five years, the Allerton project has demonstrated that this need not be the case. While conservation is not without its cost, these are lower than many people realise and can be easily afforded by those with sufficient interest and incentive. The provision of a harvestable surplus of wild game is an important motivation for many landowners or farmers to undertake such work, provided the costs of the predation control are also taken into account.”



The editor, Dr Stephen Tapper, goes on to write “In reference to agricultural practices, the terms ‘natural’ or ‘balance of nature’ are often used inappropriately. By ‘natural’ some conservationists mean an 18th century approach in which man manages the land in a sympathetic and ‘traditional’ way. In the 18th and 19th centuries agricultural practices of Britain did indeed have much to commend them; they relied on ecological cycles to maintain and build soil fertility and, although yields were low compared with those of today, they were achieved largely without using fossil fuels and pesticides. However this kind of farming was not traditional. It followed a much longer period – from the Neolithic era to the Middle Ages – during which soils were gradually impoverished, woodland was destroyed, and the treeless

uplands that we now cherish were produced. The main problem with the word 'natural' is the implication that anything 'unnatural' is undesirable. Man has affected the environment for so long that such a distinction can be as unhelpful as it is illogical.”

Dr Stephen Tapper widened his views in his 2005 report for the Trust “Nature’s gain”.

- In the seminal work of Britain’s flora, Sir Arthur Tansley dismissed farm crops as ‘artificial communities’ with only a few associated native weeds. Although he admitted that farm crops had been little studied, except by agronomists who were interested in crop yield, he was conspicuously ignoring 48% of Britain’s land surface. This was a profound mistake. So eminent was Tansley in his day that a whole generation of post-war conservationists followed his line of thought. Save for some biologists, who were alarmed at the environmental impact of the organo-chlorine pesticides on birds of prey, no-one took the ecology of croplands seriously. No one, that is, except for some wildlife biologists interested in gamebirds.
- These biologists, while reviving the management of grey partridge on post-war estates, were able to monitor year on year the collapse in breeding success of this bird during the mid 1950s. Eventually they discovered that, although the new agricultural herbicides appeared to cause no direct harm to the birds, they removed their food supply so that the young game chicks were starving to death. This provoked much wider research into the ecology of cereal crops. Dick Potts’ landmark paper on the subject, published in 1974, was entitled *Studies on the cereal ecosystem*. This was a somewhat provocative title as the term ‘ecosystem’ has been largely reserved for giant regional ecological systems like oceans, tropical forests or the arctic tundra. It got people thinking. The essence of Potts’ case was that cropland has a longer history than most people appreciate and, as a consequence, has its own unique flora and fauna, making it as worthy of conservation as an oak wood or a peat bog.
- Farming evolved independently in the Near East, China, Central America, Andes-Amazonia, and eastern United States – built around various staple crops. The first farming in Europe
- appeared in the Near East or the Levant (today’s southern Turkey, Syria, Iraq and Jordan) around 9,000 years ago when Britain was cloaked in forest and populated by Mesolithic hunters. Jared Diamond gives a good account of how wild heavy-seeded cereal grasses were probably plucked by hand from hillsides in a region where people may have had a rather settled lifestyle.

Although gathering such a wild harvest was very productive (getting 50 times the energy from the seed than was needed to gather it) they would have quickly discovered that by cultivation and deliberate sowing their harvests could be substantially improved. These Neolithic peoples, with polished stone tools and quern stones spread west across Europe during the subsequent 4,500 years, reaching Britain by about 5,500 years ago.

- Over the millennia many plants adapted to agriculture. Most are transitory pioneer annuals that flourish on disturbed ground and would otherwise die out in the face of other dominant perennials if it were not for the regular cultivations. The seeds of many of these species were gathered up in the harvest and spread with next season's sowing along with the wheat and barley. Farming changed Britain from predominantly forest with clearings, to open country with patches of woodland. This allowed animals adapted to grassland or steppe to find a home in our countryside. Birds like larks, finches, buntings and plovers, as well as gamebirds like grey partridges and quail are such species. Mammals such as brown hares, field voles and harvest mice are examples too. Less obvious are the many invertebrates.
- The first farmers in Britain cultivated the light chalkland of southern England where traces of their 'Celtic' fields can still be seen. These Neolithic stone-age farmers used wooden or bone ploughs and kept livestock as well as growing cereals. Eventually bronze and iron implements allowed the heavy land in the vales to be cleared and cultivated too. By the time the Romans arrived, Britons had been farming for over 2,000 years and the landscape may have had much the same character of woods and open fields as it has today. By Saxon times settlements had moved to lower ground, often adjacent to water courses or springs, leaving the higher ground to livestock grazing.



- The later medieval farming village was at the centre of three enormous communal fields which went through a simple rotation of wheat, followed by beans followed by fallow. Each field was divided into blocks or furlongs, and each of these into strips or selions. Although some authors have praised such a landscape as a communal one where the countryside was open to all, in fact as Rackham points out, it was very much a planned countryside and replaced a more ancient one of private enclosed fields.
- However, the landscape would change again following the agricultural revolution. Advances in crop rotation and livestock breeding encouraged a less communal approach to farming. The revolution was driven by big estates that reorganised the tenant farmers and encouraged them to implement the new methods. Norfolk was a centre of change and Holkham Hall the pioneer estate. Increased yields and increased profit meant estates could demand higher rent. The key to improving soil fertility was a rotation based on turnips and manure. By the middle of the 19th century farming was in a golden age; but, by the latter half, imports of cheap corn and meat from the New World had started a deepening recession. Except during periods of war, the first half of the 20th century was a period of depressing 'dog and stick' farming.
- In the aftermath of the Second World War, European governments determined to boost and protect home production by modernisation and by subsidy. Government funding laboratories developed new crop varieties, novel pesticides and highly mechanised systems. Two developments made a big difference; these were herbicide and bag nitrogen. These two innovations alone transformed the look of the countryside. People noticed. They wrote letters to newspapers and the BBC lamenting the loss of poppies in the fields and the dark blue-green of the winter wheat.

1. Understanding the challenge

The challenge now facing land managers is to secure both sufficient food production and environmental protection at the same time. To do this they need to appreciate both global and UK constraints and understand that their ultimate customer, the consumer, is increasingly demanding better animal welfare, purer food and a demonstrable outcome for environmental protection.

a. The World

The overall global challenge to food production will be driven by two major factors – population growth and availability of land. Other factors such as water availability and climate change will play their part.

TABLE 1 – Population of the world by major areas in 1950, 2007 and 2050 (medium variant) (United Nations 2007)

Major Area	Population (billions)		
	1950	2007	2050 (estimated)
World	2.53	6.67	9.19
Asia	1.41	4.03	5.26
Europe	0.55	0.73	0.66
Africa	0.22	0.97	2.00
North America	0.17	0.34	0.45
Latin America and the Caribbean	0.17	0.57	0.77
Oceania	0.01	0.03	0.05
UK (in millions)	50.6	60.8	68.7

World population is currently increasing at 78m people per year but in the 2050 estimate there is an assumption that fertility levels will continue to decline and by that date the global increase will be around 30m per year. These figures are based upon the medium variant used by the UN.

That medium variant assumes fertility will decline from 2.55 children per woman today to slightly over 2 children per woman in 2050. At world level, continued

population growth until 2050 is inevitable even if the decline in fertility accelerates. Due to the continual improvements in medical care, populations will age.

The Asian population, currently 60% of world population, is expected to fall to 57% whilst the African population currently representing 15% of the world will increase to 22% by 2050.

However the European population currently representing 11% of the world will decline to only 7% by 2050 but within this the UK population is anticipated to increase by 13% on the 2007 figure.

The second issue is availability of land. Between 1960 and 2005 the United Nations has calculated that the world hectares of agricultural land per capita has halved from 1.6 hectares to 0.8 hectares.



b. The UK

Current land use in the UK

The surface area of the UK is some 24.6m hectares of which 98.7% is land. In 2005 just under 74% of this land area was used for agriculture.

TABLE 2 - Land by agricultural and other uses in 2005

	Percentage of country				Area ('000 hectares)		
	Agricultural land			Forest & woodland 3	Urban land & land not otherwise specified 4	Total land (=100%)	Inland waters
	Crops & bare fallow	Grasses & rough grazing 1	Other 2				
England	30.05	37.08	5.13	8.59	19.15	13,028	76
Wales	3.17	72.29	0.96	13.80	9.79	2,073	13
Scotland	7.07	66.42	1.93	17.12	7.45	7,792	169
Great Britain	19.80	50.26	3.66	11.97	14.32	22,893	258
Northern Ireland	3.79	72.85	0.70	6.26	16.39	1,358	64
UK	18.90	51.52	3.50	11.65	14.43	24,251	322

Source: Department for Environment, Food and Rural Affairs; Ordnance Survey; Forestry Commission; Forest Service

1. Includes grasses over and under 5 years old, and sole right and common rough grazing.
2. Set aside and other land on agricultural holdings, e.g. farm roads, yards, buildings, gardens, ponds. Excludes woodland on agricultural holdings which is included in 'Forest and woodland'.
3. Forestry data for GB is compiled by the Forestry Commission and covers both private and state-owned land. Estimates are based on the provisional results of the National Inventory of Woodland and Trees for 1995-1999 and extrapolated forward using information about new planting and other changes. Data for Northern Ireland is compiled separately by the Forest Service, an agency of DARD and also covers both private and state-owned land.
4. Figures are derived by subtracting land used for agricultural and forestry purposes from the Total land area. Figures include land used for urban and

other purposes, e.g. transport and recreation, and non-agricultural, semi-natural environments, e.g. sand dunes, grouse moors and non agricultural grasslands, and inland waters.



In the past twenty years the more detailed breakdown of agricultural land use shows some significant changes.

TABLE 3 – UK Cropping 1985 to 2005 ('000 ha)

	1985	1990	1995	2000	2005
Total arable crops	5,265	5,082	4,586	4,702	4,583
Grass < 5 yrs	1,802	1,606	1,407	1,226	1,194
Permanent Pasture (grass 5+ yrs)	5,044	5,316	5,375	5,363	5,711
Total Grass	6,846	6,922	6,782	6,589	6,905
Rough Grazing	4,869	4,965	4,785	4,445	4,354
Woods	309	361	451	500	583
Set aside	-	72	633	567	559
Other	214	246	283	280	289
Total area	17,502	17,648	17,520	17,083	17,273
<i>of which:</i>					
Total cereals	4,017	3,660	3,182	3,348	2,925
Total other crops not stockfeed	708	807	804	773	909
Total other crops stockfeed	287	340	371	372	439
Horticultural crops	212	208	187	172	169

Source: Department for Environment, Food and Rural Affairs

During the period 1985 to 2005 arable land including grass < 5 years and set aside declined by 10% and rough grazing by 11%. Grass more than five years old including permanent pasture increased by 13%.

Set aside was introduced and in 1995 its area of 633,000 hectares represented 3.8% of croppable land. This had declined to 3.4% by 2005 and will currently be nearer 1.5%.

The total area of grass has remained similar but the proportion of grass older than 5 years has risen from 73.7% in 1985 to 82.7% in 2005 indicating a reduction in overall grass quality. Significantly Table 4 (below) shows that cattle numbers have declined in the same period by 20% whilst sheep numbers, having increased initially by up to 24%, were by 2005 almost identical to 1985. There has therefore been an extensification of stocking rates during this period.

TABLE 4 – UK Cattle and sheep numbers from 1985 to 2005 ('000s)

	1985	1990	1995	2000	2005
Total cattle	13,028	12,192	11,857	11,135	10,414
Dairy herd (breeding)	3,150	2,848	2,603	2,336	2,065
Beef herd (breeding)	1,359	1,632	1,840	1,842	1,768
Total sheep/lambs	35,824	44,469	43,304	42,264	35,517
Lambs < 1 yr old	17,676	22,380	21,350	20,857	17,532
Ratio – Total: lambs	2.03	1.99	2.03	2.03	2.03
Total breeding pigs	967	911	892	717	554
Total fattening pigs	6,988	6,627	6,724	5,756	4,302
Ratio – Fattening: breeding	7.23	7.27	7.54	8.03	7.77
Total laying flock	39,670	33,624	31,692	n/a	n/a
Total breeding flock	6,177	7,258	7,570	n/a	n/a

Source: Department for Environment, Food and Rural Affairs

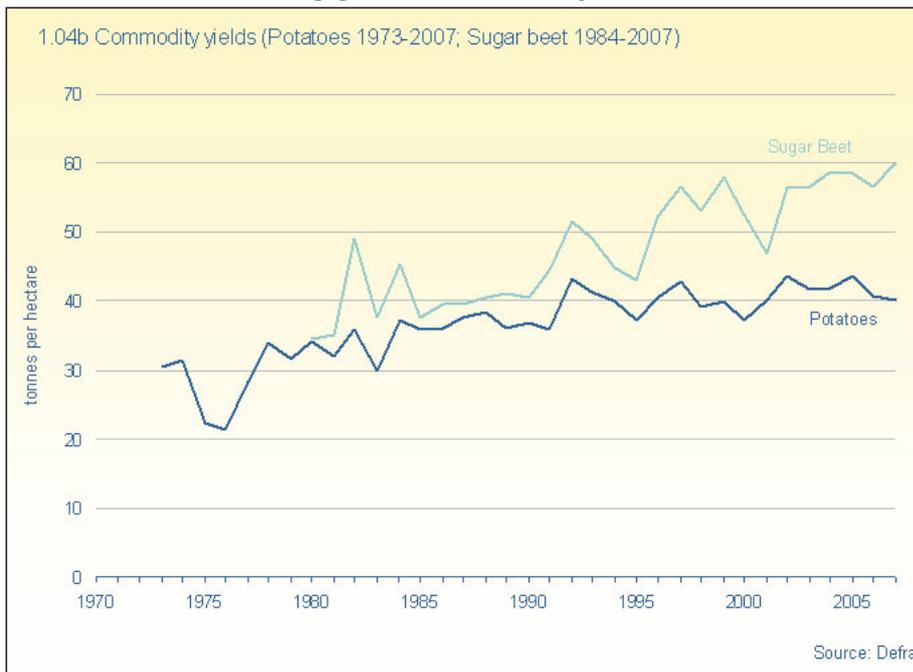
Productivity

For many years there has been a general assumption that yields of the major crops and livestock products in the UK have continued their significant upwards progress since the end of the Second World War. With the exception of sugar beet and milk this has not been the case in the past two decades.

FIGURE 1 – Commodity yields of crops and milk



FIGURE 2 – Commodity yields of root crops



In the past twenty years both sugar beet and milk yields have increased at a steady rate. Milk yields by 40% in twenty years (1.7% per annum compound) and sugar beet by 45% in the same period (just under 1.9% per annum compound).

However potatoes have only increased by 18% in the same period (just over 0.8% per annum compound) but have not increased at all in the last ten years. Similarly yields of wheat and barley have increased by less than 0.8% per annum and 0.6% per annum compound respectively in the past ten years and oilseed rape yields have not changed at all in twenty years.



It is also instructive to note from Table 4 that breeding cow dairy numbers have reduced by 34% in the same period that milk yields have increased by 40%. This has, of course, been driven by the introduction of milk quotas across the European Union in 1984.

Why have productivity gains been so disappointing? The reasons will include:

- The effect of the EU subsidy schemes
- A growing interest in conservation
- Possibly a lack of entrepreneurship within the industry
- Lack of research
- Reduction in both fertiliser and pesticide use.
- The increase in organic farming.

There will be others but there is little doubt that the increase in milk yields is due to very focussed suppliers of animal feed combined with a greater understanding of the nutritional requirement of the dairy cow, alongside much improved genetics driven by the major semen companies. The tailing off in yield improvement in cereals and oilseed rape perhaps reflects the declining influence of the nitrogen fertiliser manufacturers and, to a lesser extent, the growing public perception of the wise use of pesticides.



The three nutrients needed in greatest quantities to grow agricultural crops are nitrogen, phosphorous and potassium. The two main farming practices leading to nitrate leaching are the application of fertilisers or manures **in excess** of crop requirements and the application of organic manures at **inappropriate** times. However both nitrogen and phosphate fertiliser use has reduced significantly in the past twenty years. In England and Wales nitrogen fertiliser use has dropped by almost 30% and phosphate use by almost 50% between 1984 and 2006 (DEFRA 2007).

Between 1996 and 2006 the weight of pesticide products applied had declined very significantly.

TABLE 5 - Comparison of UK pesticide usage on all arable crops (excluding set-aside and failed crops) 1996 – 2006, area treated (ha) and amount used (t) (Garthwaite et al. 2006)

	1996		2002		2004		2006		% change 1996-2006	
	Area treated (ha)	Weight applied (t)	Area treated (ha)	Weight applied (t)						
Insecticides	4,348,334	305	4,100,682	156	4,688,011	199	4,133,301	212	-4.9	-30.5
Sulphuric acid	95,899	13,165	72,648	10,772	61,222	10,089	18,605	3,075	-80.6	-76.6
Fungicides	13,269,120	4,139	14,608,423	3,450	16,523,399	4,563	14,428,727	4,072	8.7	-1.6
Sulphur	276,630	1,245	85,490	304	88,684	406	64,293	378	-76.8	-69.6
Growth regulators	2,973,856	2,843	4,131,261	3,187	3,734,453	2,956	3,761,304	2,752	26.5	-3.2
Herbicides	12,306,556	8,421	14,679,044	8,813	15,137,078	9,024	13,198,231	7,575	7.2	-10.0
Molluscicides	457,824	134	1,100,071	363	528,571	149	904,400	282	97.5	110.4
Nematicides	53,652	410	55,088	317	44,507	323	47,503	439	-11.5	7.1
Seed treatments	4,577,704	439	4,402,044	356	4,713,082	331	4,220,741	285	-7.8	-35.1
Total – all registered pesticides	38,359,576	31,101	43,234,752	27,718	45,519,010	28,039	40,777,104	19,069	6.3	-38.7
Area grown	4,275,710		4,145,167		4,158,948		3,835,688			

It is not only the wiser use of pesticides that will be demanded but also greater accuracy in application to satisfy increasing consumer concerns.

Productivity can be measured in a number of ways apart from straight yield comparisons. For instance productivity of the UK agricultural labour force has improved very substantially on the back of increases in technology and mechanisation. Thus a declining labour force is able to harness improved technology resulting in a greater value of production per unit of labour. Table 6 (below) shows the decrease in the labour force from 1996 to 2005.



TABLE 6 – Labour force on agricultural holdings in the UK 1996 – 2005 ('000s)

	1996	2000	2005
Total labour force	616	557	541
Non family labour (including salaried managers)	246	204	190

Source: Department for Environment, Food and Rural Affairs

However the main indicator of productivity – yield per unit – has tailed off significantly with the exception of milk and sugar beet.

Self sufficiency

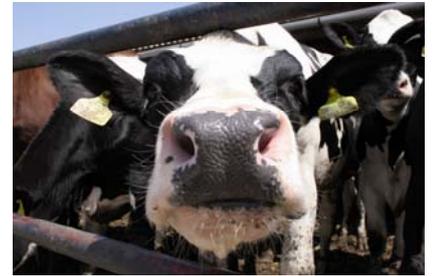
TABLE 7 – Percentage of UK self sufficiency 1996-2007 (DEFRA 2007)

	Average 1996-1998	2003	2004	2005	2006	2007
Percentage of all food	68.6	63.5	62.3	59.8	59.5	60.5
Percentage of indigenous type food	82.2	76.6	75.0	72.8	72.5	73.9

Self sufficiency is calculated as the farm gate value of raw food production divided by the value of raw food for human consumption. It peaked (in the 20th century) in 1980 having been only around 35% in the 1930s. The growth in the 1980s was a direct

result of the Common Agricultural Policy. The commodities that contributed most to the decline since 1995 are beef, pork and milk products.

- The fall in beef self sufficiency was due to a combination of the BSE export ban and the over thirty months scheme which reduced domestic production



- The fall in pork self sufficiency was due to Netherlands and Denmark displacing domestic production as a result of the impact of currency movements and disease on the competitiveness of production in the United Kingdom



- The fall in self sufficiency for milk products was mainly due to a rise in cheese and butter imports from the EU (primarily France, Irish Republic, Denmark and Netherlands), where the impact of currency movements on relative UK competitiveness would have been a factor.



Thus we have a situation of rising global population, declining land availability for agriculture per head and (in the UK at least) declining self sufficiency and a decline in the rate of yield improvement.

c. Challenges for the UK

One of the few good things to come out of the 2001 foot and mouth debacle was the report from the Policy Commission on the Future of Farming and Food (better known as the Curry Commission Report). The commission's remit only covered England but its recommendations were carefully studied by the devolved governments in Scotland, Wales and Northern Ireland. The remit was to *“advise the Government on how we can create a sustainable, competitive and diverse farming and food sector which contributes to a thriving and sustainable rural economy, advances environmental, economic, health and animal welfare goals, and is consistent with the Government's aims for Common Agricultural Policy (CAP) reform, enlargement of the EU and increased trade liberalisation.”* A not inconsiderable task and its ten member commission headed by Sir Don Curry reported in under six months.

Bravely, they started with their vision for the food and farming industry. Although it covers three pages its opening paragraph sums the vision up. *“We look for a profitable and sustainable farming and food sector, that can and does compete internationally, that is a good steward of the environment, and provides good food and a healthy diet for people in England and around the world.”*

The vision foresees

- A continuation of payment to farmers from public funds for public benefit, rewarding those for providing an attractive countryside and managing land for environmental good
- Technically efficient and profitable businesses
- Vertical integration beyond the farm gate
- Good career prospects
- That farming regains a real sense of purpose and is valued by the wider public
- Farming becomes fully integrated into the wider rural economy
- Farm businesses are supported with good supply contracts, sound advice and the ability to use and communicate the benefits of new technology.

The vision goes on to include the food processing industry, the retail and catering industries and consumers.

Importantly the vision also includes a government that has “withdrawn from its close control of agriculture” but remains supportive by “improving the implementation of regulation, and clearing the path if anything blocks the functioning of the market”. Government should create a market for environmental goods and continue “to have responsibility for food safety, nutritional policy, animal welfare and regulation on environmental protection. But wherever possible it is a facilitator, not a regulator.”.

Compare the Curry vision to the July 2008 report from the Cabinet Office strategy unit “Food matters – towards a strategy for the 21st century”. No mention there of public funds for public benefit, rewards for managing land for environmental public good, career prospects in agriculture, sound advice for the use of new technology – just concentration around the food chain, greenhouse gas emissions, food safety and waste, all important issues but failing entirely to acknowledge the role that has to be played by food producers.

However the UK will remain affected by shifts in global demand and availability from the supply side. The increase in world population and the availability of land have already been mentioned. The other important change on the demand side is a well documented movement in consumption caused by a shift from rural to urban living along with greater disposable incomes. At the basic level, demand moves from the requirement for grain and roots to meat, dairy products, sugars and fats. These in turn bring health problems (obesity) and an increase in waste from both food and packaging.

On the supply side there are four other important issues apart from land availability. The greatest of these is likely to be the availability of water bearing in mind that a kg of cereals needs anything between 0.4 and 3.0 cubic metres of water for its production whereas a kg of grain fed beef requires 15 cubic meters of water.

The issue of climate change (both adaptation and mitigation) has been well covered in an earlier document in this series by Peter Fane (Climate change and UK agriculture – implications for land management). Reduction in emissions of Nitrous Oxide and Methane and water levels are the most pressing.

The cost of energy is the third supply side factor including its effect on transport costs and fertiliser and pesticide costs. The greater the cost of energy the less fertiliser and pesticides will be used, transport costs will increase and food prices will climb.

Finally the availability of labour and skills could become critical. Not only is the agricultural workforce throughout the western world amongst the most poorly paid but the innate skills of husbandry are being lost as the profitability of food production declines.

2. Factors affecting productivity

It is to be expected that faced with a potential food crisis, any government would put the economic production of food at the top of its list.

The most striking statistic of the past twenty years is the decline in yield increases of UK crops. The reasons for this need to be understood.

a. The subsidy system

The last Great Depression in the 1930s took no prisoners. Farmers and landowners were affected by the collapsing global economy as much as the manufacturing, finance and service sectors. Land prices plummeted, many farms became unlettable and, for a time, rents became negative (that is, landlords paid tenants to take land).

The depression in agriculture only really ended with the start of World War II in September 1939. For the next six years the UK was at war and, because of U-Boat activity, home grown food became an absolute priority. Stringent production targets and restrictions were implemented by the all powerful county war agriculture committees, much permanent pasture was ploughed and those producing food were regarded as important as those fighting on the frontlines.

After the war, with a bankrupt economy, the need for home produced food remained. This need spawned entrepreneurs, research institutions, improved agricultural education and great opportunities. Backed by government, a strong farming lobby and the opportunity to make excellent profits, agriculture thrived. Even the media took up the call and the thirty years after World War II saw some of the country's finest agricultural writers blossom. The public was interested and supportive.

Profit was not guaranteed but prices of agricultural commodities were. The annual Whitehall battle between the government and the NFU to agree minimum prices for commodities became a major media event. Farming leaders such as Tom Williams and James Turner (later Lord Netherthorpe) became household names. Farming flourished. So did research, innovation and knowledge transfer through colleges, universities and the government extension service, the National Agricultural Advisory Service (NAAS). Family

“empires” flourished and not only created large and successful businesses but also participated in research and diversification of their businesses. 400 acres on the wolds of eastern counties or 100 cows on the southern downs would have been more than sufficient to provide a pleasant lifestyle.

During the 1960s UK governments tried in vain to join the then European Economic Community (EEC) but did not succeed until de Gaulle was out of the way and the UK eventually joined in 1973. The original six members of the EEC had had an even more torrid time in World War II than the UK. When they came together in the 1950s as an economic unit they represented either the vanquished nation or those that had been under occupation for much of 1939 to 1945. They too suffered food shortages and they too regarded food production as a major plank of future economic growth. Thus the Common Agricultural Policy (CAP) was born and, at its very basic level, allowed the part time French farmer to continue to work in the Peugeot car factory and still have a profitable farm at home. European farm structure was very different to that in the UK with average farm size being significantly smaller. When the UK eventually joined the EEC in 1973 a further mini bonanza in terms of profit was triggered for UK farmers. 1975 was a particularly good harvest in the UK and even on modest sized units profits of £50,000 to £100,000 per holding were quite common. Today that would equate to £500,000 to £1m.

So what happened? In the simplest terms subsidy support was too generous. Translating a support system for the “peasant” culture of European agriculture to a far better structured UK system encouraged massive over production. Even the European countries’ structure gradually improved so that they too were contributing to the grain, beef and butter mountains alongside the milk and wine lakes, as popular journalism artfully portrayed the situation at the time. Public opinion, fickle at best, began to regard farmers as the fat cat beneficiaries of huge and unnecessary European handouts. The system had to change. First the MacSharry and then the Fischler reforms moved support away from encouraging production by subsidising every tonne or litre of product, first to a regional area of support (regardless of yield) and then to the current Single Payment Scheme (SPS) where it was no longer necessary to even produce food to be supported providing land was kept in good agricultural and environmental condition. A move that the cynic might say (and he probably would not be wrong) from encouraging over production to encouraging no production at all. What will historians make of that one wonders?

b. Research and innovation

In the years after World War II both basic and applied research in food production (and in food science in general) was heavily supported by government programmes and education policy. However since the 1970s the number of universities offering degree courses in agricultural subjects and the number of active county agricultural colleges and government sponsored research farms have all declined.

It was Harold Wilson's government in the late 1960s that began the cut back in university agricultural places and then the Thatcher government of the mid 1980s that instigated research cutbacks. At the time that was, perhaps, understandable and even correct. Agriculture was on its feet, production was perhaps excessive (although the needs for overseas aid were never far away) and it was possibly time for farmers to contribute more to research and cut back public funding. The post war "green revolution" had seemingly solved the problem of feeding an ever growing global population; climate change and its effects had not been recognised and world food trade on the back of cheap energy seemed sufficient to cut back on the necessity to encourage home production.

c. The chemical revolution

Whilst artificial fertilisers and basic herbicides (weed killers) had been in existence since the end of the nineteenth century and the mid twentieth century respectively, the post World War II agricultural boom had encouraged the fertiliser companies (lead by ICI and Fisons) and the chemical giants (also lead by ICI) to pour resources into research and advice. Both companies sponsored farms where they were able to demonstrate the benefits of their products, in particular nitrogen fertilizer and a growing number of pesticides. It was very easy to demonstrate that you had to apply a lot of nitrogen fertiliser before the cost/benefit calculation became negative. Similarly the application of (initially) herbicides and fungicides appeared a "no brainer". Sales soared, industry-backed advisors flourished and the industry as a whole benefited from the huge investment by the chemical giants not only into their products but also into the wider world of agricultural research and extension. In those days not many people asked the question about any downsides and probably even fewer cared. Food production was essential and food production was profitable.

d. The conservationists

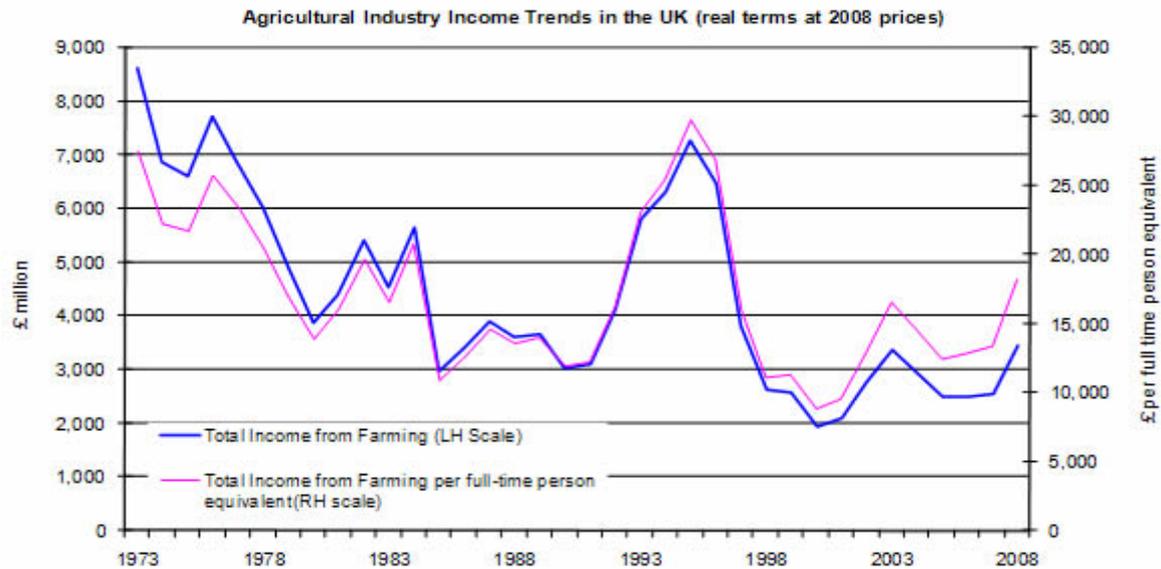
But some were concerned. A few began to ask whether anyone was monitoring the side effects of “chemical farming” on wildlife, soil structure and water. In the rush for greater and greater production were we damaging the very basis of that production (soil and water) and were we affecting our wildlife? Initially such detractors were written off as cranks at best or enemies of the state at worst. The entrenched power of the farming lobby, the chemical manufacturers and increasingly the supermarkets were not keen to have their cosy alliance disturbed. The first two needed profitable volume based production and the last consistent supplies of cheap food for its customers. Whilst they were making profits, farmers did not really worry about the cheapness of the food in the supermarket and the chemical companies needed a lucrative agriculture into which to sell. It seemed a virtuous circle, government and the supermarkets wanted cheap food for its citizens and customers which was being produced by a reasonably profitable agricultural industry supported by a very prosperous supply trade. For a time all seemed well.

If one event has to be singled out as the start of the questioning of the effect of modern agriculture, it was probably the publication in 1962 of the American marine biologist, Rachel Carson’s, “Silent Spring”. She died two years later but the effect of her book, initially on the American government and later on world governments, was to outlast her lifetime.

More people began to ask more questions. Few doubted the huge benefits of modern agricultural techniques but more and more wanted to understand what, if any, were the downsides as far as the natural world was concerned. The nascent organic movement, created in the nineteenth century, woke up. In the UK the Thatcher government created the Wildlife and Countryside Act of 1981 which, amongst other things, began the protection of certain mammals, birds and land. Designations became common, regulation became rife. Suddenly, it seemed, agriculture had to start listening to others and, for many, that was a shock.

At the same time rewards to farmers in terms of profit (defined by DEFRA as “Total Income from Farming”) started their long deterioration.

FIGURE 3 – TIFF



Source: Department for Environment, Food and Rural Affairs

The conservation bandwagon had started. Government sponsored quangos sprang up, academia began to offer a far wider portfolio of courses embracing environmental management and new membership bodies from within the agricultural industry also contributed (notably FWAG and LEAF). Another organisation, the Game Conservancy Trust (now the Game and Wildlife Conservation Trust), born nearly eighty years ago out of Eley Cartridges, began its ground breaking research into the decline of some game species (particularly the English grey partridge). This research in the 1980s showed conclusively that the decline in the grey partridge was due to a lack of insects on which grey partridge chicks survived in the early weeks of their lives. The reason for the decline in the insects was a combination of pesticide use and lack of the correct habitat. Out of this work came the understanding for the necessity of unsprayed grass and crop headlands around fields to provide that habitat, which became an integral part of the English and Welsh environmental stewardship schemes introduced at the beginning of this century.

It would be grossly unfair to label land managers as non conservationists. Many, probably most, care a great deal about the countryside in which they operate. They, better than most, appreciate the balance that is required between successful food production and conservation of wildlife. For centuries they and their predecessors both maintained and shaped the landscape and the natural habitat of their land both for sport and for the pleasure of being part of a beautiful and essential habitat.

Conservation is not big business. The challenge is to combine both food production and conservation to the benefit of both.

e. Entrepreneurs within

For reasons that are not fully obvious there seems to be a lack of entrepreneurial land managers at present. These are dangerous lines to write because they are bound to upset some genuine contenders but I sense that partly as a result of declining profitability in food production, partly as a result of overriding regulation and partly as a result of the increase and interest in conservation, the entrepreneurial spirit has been somewhat dampened. Perhaps sixty years of relative prosperity have taken the edge off innovative and entrepreneurial methods of production and management. Whatever the cause the time is now ripe for a new and younger generation to show what can be done. Perhaps there has been too much emphasis on the need for political farmers, for media savvy farmers and for good communicators at the expense of true business skills with a good understanding of the needs of conservation alongside efficient food production.

It will be essential to foster that entrepreneurial spirit to make sure we do not lose the originality that is spawned from entrepreneurs. Perhaps we need to develop an infrastructure to encourage and develop new entrepreneurs.



3. Post 2012 – a new world?

The current European Single Payment Scheme comes to an end in 2012 when farmers should be completing the now familiar Single Application Forms for the last time under current regulations. However there is still some uncertainty whether this date will be pushed forward.

The mid term Health Check completed in January 2009 has not taken us very far in describing life post 2012. This, of course, is not untypical of the European Union who for fifty years since its original inception as the six nation European Coal and Steel Community, has made progress by evolution rather than revolution. Evolution takes time and much negotiation. The only event that could arguably be regarded as revolutionary (in terms of speed) was the introduction of milk quotas in 1984.

The 2009 Health Check agreed the following changes to the current Single Payment Scheme:

- Phasing out milk quotas by April 2015 which includes a 1% per year increase in quotas each year between 2009/2010 and 2013/2014.
- Full decoupling of support (no production linked payments) other than where Member States (MSs) wish to maintain current levels of coupled support of suckler cow, goat and sheep premia.
- Assistance to sectors with special problems (“Article 68” measures) so that MSs may retain 10% of their national budget ceilings for direct payment towards environmental measures or quality and marketing initiatives, which can now be used across different sectors, including risk management measures such as insurance schemes for natural disasters or mutual funds for animal disease.
- Using currently unspent money from national envelopes for either Article 68 measures or direct transfer into their Rural Development Fund.
- Increasing compulsory modulation (shifting money from Pillar 1 to Pillar 2) to 10% by 2012 plus additional modulation of 4% on payments above €300,000 a year.
- Increasing investment aid to young farmers from €55,000 to €70,000.
- Abolition of set-aside to maximise production potential.

- Simplification of Cross Compliance measures where they are not relevant or linked to farmer responsibility. However new requirements will be added to retain the environmental benefits of set-aside and improve water management.
- Reducing intervention support for pigmeat, barley and sorghum and restricting intervention rules for wheat, butter and skimmed milk powder.
- Energy crop premium will be abolished.

There is little in these measures to indicate any major changes to the Single Farm Payment regulations from 2013. So what should land managers be wanting? The comfortable status quo or a more radical change to reflect the rapidly altering economic, physical and political world?

Can land managers, by utilising SFP in a different way, achieve greater production and greater conservation at the same time?

a. Research and Development

“Policy makers tend to view science like a drunk views a lamp-post: more for support than illumination”

(Sir David King, Chief Scientific Adviser to the Government, 2000-2007)

The major funding body spending money on research into farming science is the Biotechnology and Biological Sciences Research Council (BBSRC).

In the three years to 2006/2007 the overall BBSRC agricultural research spend is shown in Table 8

TABLE 8 - BBSRC agricultural research spend

Committee	Overall BBSRC research spend in £m		
	<u>2004/2005</u>	<u>2005/2006</u>	<u>2006/2007</u>
Agri-food	40.2	42.0	47.2
Animal sciences	33.9	43.1	49.5
Biochemistry and cell biology	36.3	38.1	43.6
Bimolecular sciences	28.3	30.7	34.7
Engineering and biological systems	21.8	26.8	31.2
Genes and developmental biology	42.9	47.5	49.8
Plant and microbial sciences	<u>33.4</u>	<u>38.0</u>	<u>40.7</u>
Total (excluding capital, buildings and equipment and facilities spend)	<u>236.7</u>	<u>266.3</u>	<u>296.7</u>

Source: BBSRC annual reports

BBSRC also funds areas outside the agricultural sector. Its total expenditure in the three years noted in Table 8 was:-

<u>Year</u>	<u>£m</u>
2004/2005	267.8
2005/2006	304.0
2006/2007	350.9

Thus the total increase in expenditure from 2004/2005 to 2006/2007 was 31.0% compared to an increase of 25.3% in the agriculturally related research areas covered in Table 8.

The issue of declining research has recently been covered by the Commercial Farmers Group (Leaver, 2008) in a paper titled “The need for a new vision for UK agricultural research and development”. Leaver argues that the continuing decline in agricultural research and development is reducing the competitiveness of the UK agricultural industry and putting food security at risk. He calls for a new vision to develop innovative agricultural systems that are competitive, which reduce reliance on food imports but which also deliver the required environmental benefits.



The paper sees agriculture as a key strategic industry in the UK, quite disproportionate in significance to its direct contribution to national GDP.

Research by Professor Dianna Bowles (University of York) is highlighting the use of agricultural raw materials as feedstocks for industrial production being key to the new bio-based economy.

She highlights the use of solar energy as a source for manufacturing through what she terms “plant cell factories” capable of producing starches, sugar, fibres, biomass, oils and proteins. She argues that the full potential of the plant production system has yet to be realised especially from lignocelluloses.

Leaver argues that there is a direct link between the declining growth of UK agricultural productivity and the reduction in agricultural research and development capacity. He further argues that the result of losing much of the applied research and development infrastructure and scientists with knowledge of the industry, is that a vacuum has been produced between basic scientific research and practice. It is not so much the amount of money being spent on research and development but a change in the balance between basic, strategic and applied research and development.

The priorities for research and the necessary knowledge transfer would seem most pressing in the following areas:-

1. Yield improvement in crops (particularly potatoes and cereals) which would include advanced plant breeding, greater understanding of the needs for successful crop establishment and a better understanding of the potential benefits of genetic modification particularly in relation to disease resistance, better water utilisation and nitrogen fixing capabilities.
2. Improvement in feed conversion rates for livestock including long term feeding trials on both livestock performance and product quality.
3. A better understanding of soil and water issues including rotation analyses, soil and crop nutrition, the effects of machinery compaction, better energy efficiency, drainage and the reduction in soil borne pests including nematodes.
4. Reduction of greenhouse gas emissions from both crops and livestock systems.

The UK (and the whole of Europe) is being rapidly left behind in the development of genetically modified crops and livestock. This is an emotive issue for many especially as most of the research to date has been carried out by commercial companies who are, quite naturally, looking for commercial profit. This has lead, rightly or wrongly to some public mistrust of that research.

To overcome this, government should take on the responsibility for research into genetic modification of both crops and livestock to prove the long term safety or otherwise of these processes.

In 2007 there were some 115m hectares of GM crops grown worldwide. Table 9 below shows the top ten countries.

TABLE 9 – Global area of GM crops in 2007 (m ha)

	<u>Country</u>	<u>Area</u> <u>(m ha)</u>	<u>% of</u> <u>Total</u>
1	USA	57.7	50.3
2	Argentina	19.1	16.6
3	Brazil	15.0	13.1
4	Canada	7.0	6.1
5	India	6.2	5.4
6	China	3.8	3.3
7	Paraguay	2.6	2.3
8	South Africa	1.8	1.6
9	Uruguay	0.5	0.4
10	Philippines	0.3	0.3

Source: Clive James (International Service for the Acquisition of Agri-Biotech Applications), 2007

No European country is included in the top ten but Spain comes in 11th equal at 0.1m ha.

The fact that these crops are being grown in relatively large areas in North and South America, India and China does not itself mean that the necessary research has been done but it does mean that they are stealing a march in terms of experience. A likely global food shortage is the reason why the possibilities for genetic modification as one source of easing that pressure must be researched.

The reduction in investment in Research and Development is very concerning and should be reversed.

b. Of badgers, beavers and bumblebees

“There is no point tackling one source of infection only to ignore another”
(Elin Jones, Rural Affairs Minister, Welsh Assembly Government. 2009)

Consumers are increasingly concerned about environmental matters.

These three species illustrate the current problems across the political, conservation and research divide. The badger is both a political and conservation issue, the beaver an issue of reintroduction protocol and the bumblebee illustrates the paucity of vision in choosing areas for research funds.

- The Badger Acts have set out to save a persecuted and endangered mammal. There was no doubt that protection was needed but little or no consideration was given to what might happen if badger populations grew to “pest” proportions. The further problem of the effects of cross infection between wild mammals such as badgers and deer with domesticated bovines such as cows was also given little thought at the time.



The result is that we now have a three way welfare problem for badgers, cows and farmers. Whatever the correct scientific interpretation of the Krebs’ trials is, there appears little doubt that badgers and cattle can infect each other with TB. Political obfuscation has only added to the frustration felt by farmers and has helped neither badger nor bovine in the process.

There is still no sure way of accurately estimating the badger population but the evidence in the countryside is very clear – badger populations have exploded. The physical damage caused to buildings, earth banks, grazing pastures and even gardens is indisputable. Road kills are increasing and where TB testing is carried out on badger carcasses, the incidents of TB are high. The cost of TB to the taxpayer (see Table 10 below) allied to the increasing incidents of TB in dairy herds and almost undoubtedly in other wildlife, cries out for effective action.

TABLE 10 - Breakdown of bovine TB expenditure in Great Britain: 1998/99 – 2007/08 (£m)

Activity	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08 ₁
Cattle Testing	7.3	17.6	13.3	5.4	24.7	33.2	36.4	36.7	37.8	32.6
Compensation	3.5	5.3	6.6	9.2	31.9	34.4	35.0	40.4	24.5	29.7
RBCT	2.9	4.6	6.6	6.0	6.6	7.3	7.2	6.2	1.63	0.03
Surveillance activity By the VLA	1.9	2.4	3.5	3.7	4.1	5.3	4.9	7.5	6.4	7.9
Other Research ₂	2.5	3.8	5.3	6.1	6.5	7.0	5.7	6.5	7.78	8.5
HQ/Overheads	6.7	4.5	0.9	0.1	0.7	1.0	1.3	1.8	1.7	1.2
Totals	24.8	38.2	36.2	30.5	74.5	88.2	90.5	99.1	79.71	79.93

Source: Department for Environment, Food and Rural Affairs

1. 2007/08 figures are provisional and subject to change
2. Figure does not include research into culling methods or the badger population survey (£709.4k in 2005-06 and £834.7k in 2006-07)

Notes:

1. Cattle testing - the cost of carrying out the testing of cattle for TB by arranging, assessing and monitoring tests, conducting investigations of incident herds and diagnostic testing by Local Veterinary Inspectors on behalf of Defra. **NB:** These costs include Scotland and Wales (*funded by Defra*).
2. Compensation - includes payments for 'reactors' and 'contact animals' which are compulsorily slaughtered. This includes 'salvage' money received by the Government for those carcasses which are permitted to go into the food chain or are eligible for Over Thirty Month Scheme payments. **NB:** These costs include Scotland and Wales and are funded by their respective Governments.
3. Surveillance activity by the VLA - includes all Defra funded work carried out by the Veterinary Laboratories Agency relating to TB in cattle and badgers including the supply of tuberculin.
4. HQ/overheads - includes staff costs for veterinary advice and administration of TB policy in England, Scotland and Wales.

Almost £642m has been spent in the ten years to 2007/2008 on TB related expenditure in Great Britain.

There needs to be balance in all things and this rapidly unfolding disaster illustrates so well the need for active management of our wildlife.

- Reintroduction of species long absent from the UK is also becoming increasingly common. History is littered with alien introductions such as grey squirrel, muntjac deer and mink.



The grey squirrel has driven our native red squirrel to the northern edges of these islands, the muntjac is adding to the general increase in the deer population and causing much damage while the escape of mink from mink farms (both accidental and aided) have virtually wiped out the native water vole.

At a time when we argue about how to deal with our existing wildlife, it seems perverse to reintroduce species that have not lived in these islands for centuries.

If allowed to, the beaver will cause huge damage to rivers, affecting the economy of fisheries, and to canal banks, potentially disrupting commercial traffic. If kept in captivity they will almost certainly escape and if allowed into the wild (as is being mooted in Scotland) will they be controlled?

Although it will take time there is no doubt that reintroduced species will begin to cause increasing damage both to infrastructure and other wildlife. Once reintroduced there will be a clamour against culling without an understanding and agreement to manage wildlife.

- The decline of the bee is a classic example of cutting research.



The National Audit Office has recently calculated that the value of honeybees to the economy, through its ability to pollinate plants, is worth almost £200m a year. Nearly half of this benefit applies to

apples and almost 40% to a combination of oilseed rape, raspberries and strawberries.

Dr A R W Smith, Retired Reader in Microbial Biochemistry at the University of Greenwich (letters to the Times, March 7th 2009) reports that in the early 1990s funds to attempt breeding for resistance against varroa were turned by MAFF (DEFRA's precursor) at a time when bumblebee species had already dropped from 16 to 6 as a result of widespread use of pesticides. It was pointed out to MAFF that if the varroa mite were not controlled there would be a risk that pollination of annual crops and fruit would be seriously jeopardised in the near future. That has all come to pass and the lead time that would have been available in the early 1990s has now been lost.

Although DEFRA has recently announced a £4.5m grant it is essential that this is used for research rather than regulation. The grant represents only 2.25% of the estimated annual economic advantage of bee pollination.

c. Conservation – give land managers the responsibility

“No one made a greater mistake than he who did nothing because he could do so little”

(Edmund Burke, 1729-1797)

There is currently a debate about how to replace the environmental benefits that came (perhaps unexpectedly) with set-aside now that set-aside has been abolished under the recent Health Check. Natural England favour a compulsory model whereby between 4% and 6% of arable land would have to continue to be set-aside whilst the NFU and CLA together have persuaded DEFRA to consider a voluntary approach. It appears that DEFRA favours this providing that farmers will deliver. Perhaps it is now time for farmers and land managers to take greater responsibility upon themselves to provide a suite of environmental and landscape benefits, as well as producing food, whilst receiving payments from the Single Payment Scheme.

For too long agri-environment schemes have been imposed from the top rather than created from the bottom. Now that the need for both food security and environmental security is being understood, this should be the moment that land managers seize the opportunity to show they can deliver both.

Three of the leading conservation charities (Game and Wildlife Conservation Trust, Farming and Wildlife Advisory Group and Linking Environment and Farming) have been considering biodiversity cooperative initiatives. The aim of this project is to develop a cooperative approach to producing biodiversity and environmental goods on farmland at the landscape scale.

Although agri-environment schemes have been running for almost 22 years there is concern that these schemes have focussed on what the land manager is obliged to do (prescription led) not what might actually be achieved for the benefit of wildlife and the environment (outcome led). The schemes are also individually farm based with little scope to develop a landscape scale other than in some designated areas.

The unforeseen consequence of this has been that many farmers view the environment as an enterprise within their farm business, competing with other enterprises for space. Now that the Single Farm Payment is fully decoupled from production, environmental options can become uncompetitive in times of rising crop and livestock product prices. Thus a new approach being a bottom up, farmer driven

and outcome led model delivering environmental gain on a landscape scale is needed.

The three charities seek to establish a biodiversity cooperative blueprint that will:

- Provide regional/landscape scale biodiversity with an organisational form.
- Allow self governance, individual responsibility and reduced red tape.
- Allow farmers and the local community to decide on their own wildlife and habitat targets.
- Allow participants to focus first on the biodiversity outcomes that they wish to see, then decide how they want to manage their land to achieve that.
- By radically changing the management approach allowing the participant to take an ecosystems approach to farming and biodiversity in their area.
- Allow the development of new institutional relations between government agencies and the agricultural community.
- Develop trust and new social networks with rural communities.
- Re-embed farming in its local social and ecological context.

Such co-operatives would include:

- Farmers and other agricultural entrepreneurs including existing farmer cooperatives and informal groups of farmers.
- Environmental organisations and relevant agencies.
- Local businesses, villages and other rural stakeholders.

Such an approach would give opportunities and define measures such as:

- Wildlife habitat corridors to allow wildlife to move in response to climate change.

- A mosaic of habitats within geographic areas to provide for the requirements of a wider range of flora and fauna.
- River catchment scale soil management planning.
- Community level water quality and quantity strategies.
- Basic energy objectives – energy auditing and carbon footprint measurement.
- Training and education.

Key outcomes would include:

- Improved biodiversity across a large tranche of land.
- Ownership at a local level of specific biodiversity benefits.
- Strengthened partnerships between farmers and their local communities.
- New Biodiversity Action Plan indicators.

d. How to shape the future?

“What we had thought of as abundant food supply is anything but, Western societies, in particular, have tended to take their food supply for granted. The global system as currently operated will reach breaking point unless action is taken.”

(Food Futures; Rethinking UK Strategy. A Chatham House Report, 2009)

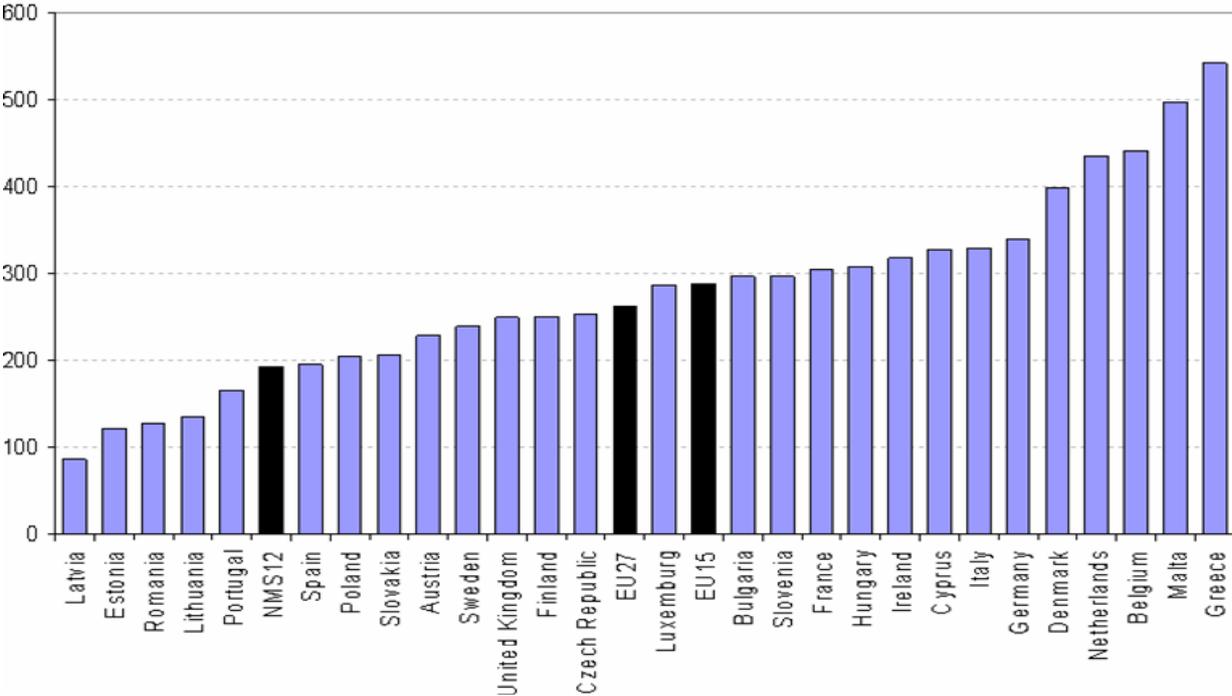
How are we to manage the future cash emanating from the SPS?

When the Single Payment Scheme was introduced in 2005 it was seen as a final break with production led subsidies. Furthermore land managers were warned that they should use the eight years of the scheme to prepare for farming “without subsidies”.

The UK’s total direct payments are a little over €4bn. It is likely that support will continue to emanate from Europe but the debate has to be in what form and what for.

The current direct payments to each Member State (MS) and the average payment per beneficiary in each MS are shown below in Figures 4 & 5.

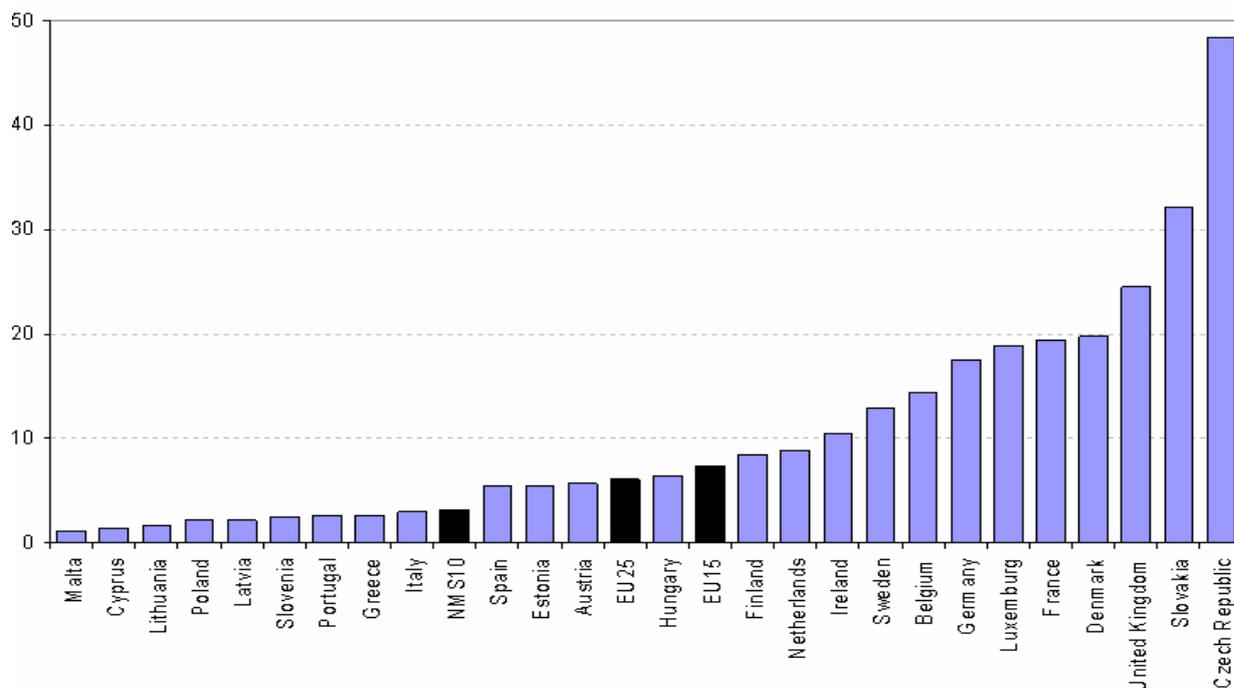
FIGURE 4: Average direct payment per MS (in €per hectare)



Source: DG AGRI

Figure 4 shows the average direct payment for each Member State in euros per hectare for all the current 27 members. The UK figure of just under €250 per hectare is a little below both the old EU 15 average and the current EU 27 average.

FIGURE 5: Average direct payment per MS (in €000 per beneficiary)



Source: DG AGRI

Figure 5 shows the average direct payments per beneficiary for each MS but excludes the two latest members, Bulgaria and Romania. In this instance the UK's larger farm structure produces an average figure per beneficiary of almost €25k, substantially ahead of all other MSs other than Slovakia and Czech Republic.

When the break was made by MacSharry from production payments to area payments it was tacitly understood that such payments could not continue for ever although that was never officially stated. The receipt of the Single Farm Payment is a significant part of farmers' income but remains based on the compensatory principle which will become harder and harder to justify as farm businesses change, grow and move away from the original cropping and stocking on which the payments have been calculated. If nothing is done payments will become a form of increasingly irrational income support. This is not a sustainable way forward.

The current support system is complicated. Funds from Europe can be modulated (reduced) with the modulated portion being transferred to Rural Development Schemes. There can also be further co-funding or match funding from MS

governments. Competitiveness between MSs can be adversely affected depending on how individual MSs deal with modulation (currently there is a combination of compulsory modulation for all and further voluntary modulation by state).

These Rural Development Funds can (within a certain range) be used for (1) improving competitiveness in agriculture and forestry, (2) improving the environment and countryside (3) improving quality of life in rural areas and encouraging diversification. Again the percentages of the modulated funds that go to each of these three axes can and do vary between individual MSs.

In future there could be the option for MSs to make their own decisions about the use of funds but this would go against the concept of a common market. Also there is a belief (possibly unfounded) that the UK would be at a disadvantage to their European colleagues if national governments had control of the funds. There is already evidence that the devolved administrations in Scotland, Wales and Northern Ireland (being less urbanized than England) tend to favour farming and countryside issues to a greater extent than their English counterparts.

Simplification would be a boon and that should be a target post 2012. More importantly the ending of the current arrangements gives the opportunity for radical change. Direct payments should, post 2012, be targetted differently to reflect changing priorities.

- **Basic stewardship**

A revised cross compliance code should be drawn up making use of the lessons learnt between 2005 and 2012. The new cross compliance would include elements of the Entry Level Scheme (England) and Tir Cynnal (Wales). The aim would be to continue to keep land in good agricultural and environmental condition, aiding conservation, landscape preservation and maintaining the countryside in an attractive and appropriate state for tourism, wildlife habitats and enjoyment by the wider public.

- **Higher level agri-environment schemes**

The option to support organic farming could be taken here but these schemes should primarily be tendered for by groups of farmers and conservationists on a landscape basis.

- **Hill support**

The hills continue to merit special help and should have a specific allocation of funds to maintain the viability of the farm businesses.

- **Research**

Whilst many may see research and development as of national importance and therefore to be funded by national government, the fact is that public funds will be under severe constraint for the foreseeable future. The best that research can hope for is a slightly larger slice of a much smaller cake. There is therefore a case that a proportion of European funds should be used for improving the research, development and knowledge transfer capabilities in the UK.

- **New entrants/ young farmers**

New entrants both from outside the industry and from within need to be encouraged and younger farmers should arguably be helped in the early stages of their careers. This area is complex to regulate as there is always a danger that additional funds can go to existing and well established businesses just through bringing a younger member of the family into the partnership. These funds should be aimed at encouraging entrepreneurial activity in the under forties.

- **Marketing and the food chain**

Creating a fairer food chain for primary producers and improving their marketing skills remains a priority.

- **Market failure and strategic support**

Because the amount of European funds going directly to producers purely for fulfilling cross compliance obligations will be significantly reduced under these proposals, there needs to be a fund built up to deal with either market failure in a particular commodity or possibly strategic support for an area of agriculture. The current decline in the dairy industry is an example where government may decide that strategic support is essential in order to maintain a viable industry.

So how could the direct payment cake be split? Because of the widening of the proposed funding requirements there would have to be a significant reduction in the current payment for cross compliance. Within the UK modulation from Pillar 1 to Pillar 2 ranges from less than 10% to 18% depending in which country the farm is situated.

Thus payments for cross compliance range from more than 90% of the total to 82%. Any reduction in this figure is likely to be challenged by the farming unions on the simple grounds that their members would be significantly worse off if payments for cross compliance were severely reduced. However the debate should not be simplified in this way but should be about the long term security of both food and the environment as well as the specialist areas such as the hills along with the *quid pro quo* that part of the deal would be a price safety net to take account of temporary market failure.

A percentage split in the seven areas targetted for funds could be:-

	% of direct payments
Basic stewardship	35-50
Higher level agri-environment	15-25
Hill support	5-10
Research	5-10
New entrants/young farmers	5-10
Marketing and the food chain	5-10
Market failure and strategic support	5-10

It will be important for land managers to understand that they need to have responsibility for food, flora and fauna – a balance will be essential.

4. Conclusions, timelines and priorities

These proposals are radical. They seek to take away from existing land management businesses a significant proportion of the monies they receive for cross compliance under the existing SFP regulations. Less money would be received for cross compliance and ELS/Tir Cynnal schemes, there would be an increase in the amounts going to higher level agri-environment (HLS/Tir Gofal) and hill support schemes and new streams would be opened for research, new entrants/young farmers, marketing and food chain promotion and, importantly, a fund to cover market failure and strategic support.

Is this justified and, importantly, can existing farm businesses survive with a much reduced income from SFP?

British agriculture needs to make a major step change in both productivity improvement (meaning both increased yields and greater technical efficiency) and entrepreneurial innovation. This will not be achieved by continuing with the comfortable status quo where, in many cases, the older generation continue to be the decision makers partly supported by an insufficiently well targetted SFP. This is not to deny that there are many well run farming businesses where the next generation is given ample opportunity to run and develop the business. However these examples are not the norm.

Critically, there will need to be a backstop should product prices fall to unsustainable levels or a particular sector of the industry suffers to the extent that its future may be in question. That is why some monies must be put aside for a combination of both price support and strategic sector support to prevent market failure.

At the same time the importance of maintaining and enhancing the natural environment must be both encouraged and funded. Much has been written elsewhere about the importance of our natural habitats and the flora and fauna they support. For many generations farmers and landowners have worked with nature and they are best placed to continue protecting and improving landscapes and habitats. They need to continue their work of providing both food and protection of nature.

The backdrop to our national picture is of a world of increasing population, reducing farmable land area, the effects of climate change and, now, a serious world recession. It appears inevitable that public services will have to be cut across the board, taxation will rise and consumers' disposable income will drop. Times will be

difficult for most businesses as well as consumers and will necessitate an element of self help particularly in research and development.

Time is short and the politics are complicated. Reform of the SPS is a European matter and, unless MS governments are allowed more autonomy in decision making, the progress of reform is likely to be slow.

At worst the existing SPS regulations could simply be rolled forward from 2013 for a further eight years. This would be a missed opportunity.

Understandably the farming lobby is likely to resist a major loss of direct income. However the debate must be started and that debate should include the next generation of farmers and landowners. Managing land and landscape brings with it a responsibility to the wider public and this needs to be both understood and delivered by land managers.

The debate needs to be started now and concluded in the next three years in time for implementation at the beginning of 2013.

The questions that need debating are:

- **Who should lead the reform process?**
- **Can Europe agree?**
- **If not, should a much larger proportion of SPS funds be under MS control?**
- **Would such a move be damaging to individual MS competitiveness?**
- **Can a balance between food security and environmental security be achieved?**
- **Will a safety net for producers be sufficient to encourage a widening of the uses for SPS funds?**
- **Will the next generation be given the opportunity to use its energy for entrepreneurial innovation?**
- **What role can NGOs play in both shaping future policy and, importantly, helping delivery?**

- **Can the farming industry demonstrate to the public what it is delivering both food production and landscape and environmental protection?**
- **Will the farming skill base be maintained?**
- **How will retailers react – selfishly or responsibly?**



Appendix of relevant organisations

1. Farmer and landowner representation

Commercial Farmers Group (CFG)

Seeking opportunities to meet those in positions of influence so that we might advance what we believe to be those arguments, based on fact, that support policies aimed at maintaining a sound and viable agricultural industry in the UK.

Country Land and Business Association (CLA)

Representing owners of land, property and businesses in rural England and Wales; speaking for everyone who believes in a living and working countryside; promoting members' interests and influencing decision makers to ensure the positive development of the rural economy.

Farmers Union of Wales (FUW)

Protecting and advancing the interests of those who derive an income from Welsh agriculture.

National Farmers Union (NFU)

Championing British farming and providing professional representation and services to its Farmer and Grower members.

Scottish Rural Property and Business Association (SRPBA)

Representing the role and interests of those involved with rural property and business connected with the land in Scotland.

Tenant Farmers Association (TFA)

Dedicated to the agricultural tenanted sector; seeking to support and enhance the landlord-tenant system.

Ulster Farmers Union (UFU)

Promoting and supporting a vibrant and sustainable rural economy where agriculture is secure and pivotal to its future in Northern Ireland.

2. Conservation bodies with strong farming links

Farming and Wildlife Advisory Group (FWAG)

An independent and farmer led organisation seeking to support, enthuse and inspire fellow farmers to value the environmental assets on their land and use them to secure a sustainable and profitable business for the future.

Game and Wildlife Conservation Trust (GWCT)

A scientific charity promoting for the public benefit the conservation of game and its associated flora and fauna; conducting research into game and wildlife management and the effects of farming and other land management practices on the environment; advancing the education of the public and those managing the countryside in the effects of farming and management of land which is sympathetic to game and other wildlife.

Linking Environment and Farming (LEAF)

Committed to a viable agriculture which is environmentally and socially acceptable and ensures the continuity of supply of wholesome, affordable food while conserving and enhancing the fabric and wildlife of the countryside for future generations.

3. Animal protection

Royal Society for the Protection of Birds (RSPB)

Striving for the conservation of wild birds and the wider environment on which they depend; maintaining bird numbers, diversity and geographic distribution.

Royal Society for the Prevention of Cruelty to Animals (RSPCA)

By all lawful means, preventing cruelty, promoting kindness and alleviating suffering of animals.

4. Campaigners

Campaign for the Protection of Rural England (CPRE)

Campaigning for a sustainable future for the English countryside; highlighting threats and promoting positive solutions; actively campaigning and, through reasoned argument and lobbying, seeking to influence public opinion and decision-makers at every level.

Campaign for the Protection of Rural Wales (CPRW)

Aiming to secure the protection and enhancement of the diverse landscapes and environment of Wales; seeking to influence change for the better and promoting positive solutions for the long-term future of the countryside whilst seeking to protect the best qualities of the natural and built environment.

National Trust (NT)

Promoting and looking after places of historic beauty permanently for the benefit of the nation across England, Wales and Northern Ireland.

5. Regulators

Countryside Council for Wales (CCW)

Government's statutory advisor on sustaining natural beauty, wildlife and the opportunity for outdoor enjoyment in Wales and inshore waters.

Environment Agency (EA)

A government agency to look after and improve the environment in England and Wales.

Forestry Commission (FC)

Delivering distinct forestry policies for England, Scotland and Wales through specific objectives drawn from the country forestry strategies.

Natural England (NE)

The government's advisor in England on the natural environment providing practical advice, grounded in science, on how best to safeguard England's natural wealth for the benefit of everyone.

6. Government departments

Department of Energy and Climate Change (DECC)

Created in October 2008 to ensure that energy is secure, affordable and efficient; to bring about the transition of a low-carbon Britain; to achieve an international agreement at Copenhagen in December 2009.

Department of Environment Food and Rural Affairs (DEFRA)

To secure a healthy environment in which we and future generations can prosper.

Glossary of Abbreviations and Terms

BAP	Biodiversity Action Plan (from the EU Bird and Habitat Directives)
BBSRC	Biotechnology and Biological Sciences Research Council (UK's leading funding agency for academic research and training in the non-clinical life sciences)
CAP	Common Agricultural Policy (of the European Union)
Chatham House	Home of the Royal Institute of International Affairs
CLA	Country Land and Business Association
Cross Compliance	Measures that must be undertaken by land occupiers to keep land in good agricultural and environmental condition in order to qualify for receipt of the Single Farm Payment
DARD	Department of Agriculture and Rural Development (in Northern Ireland)
DEFRA	Department of Environment Food and Rural Affairs
EEC	European Economic Community (now known as the European Union)
ELS	Entry Level Scheme (England)
EU	European Union
Fischler	Franz Fischler, European Union's Commissioner for Agriculture, Rural Development and Fisheries (1995 – 2004)
FWAG	Farming and Wildlife Advisory Group
GB	Great Britain (England, Scotland and Wales)
GDP	Gross Domestic Product (being a measure of wealth creation)
GM	Genetic modification

GWCT	Game and Wildlife Conservation Trust
ha	Hectares (being 2.471 acres)
HLS	Higher Level Scheme (England)
ICI	Imperial Chemical Industries
Krebs	Professor John Krebs was commissioned by the government in 1996 to investigate links between bTB (bovine tuberculosis) in cattle and badgers
LEAF	Linking Environment and Farming
MacSharry	Ray MacSharry, European Community's Commissioner for Agriculture, Rural Development and Fisheries (1990 – 1994)
MAFF	Ministry of Agriculture Fisheries and Food (precursor to DEFRA)
MS	Member State
MSs	Member States
NFU	National Farmers Union
Pillar 1	CAP funds for direct aid to farmers and market measures
Pillar 2	CAP funds for rural development measures
RAC	Royal Agricultural College, Cirencester
RDF	Rural Development Funds for funding rural development programmes
RICS	Royal Institution of Chartered Surveyors
SFP	Single Farm Payment
SPS	Single Payment Scheme
TB	(Bovine) tuberculosis

TIFF	Total Income from Farming (a DEFRA measure of farm profitability)
Tir Cynnal	The Welsh entry level scheme
Tir Gofal	The Welsh higher level scheme
UK	United Kingdom (England, Scotland, Wales and Northern Ireland)
UN	United Nations
VLA	Veterinary Laboratories Agency
WAG	Welsh Assembly Government

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