

Domestic and International Pressures for European Agricultural Adjustment and Their Implications

David Colman

Paper presented to

International Agricultural Trade Research Consortium
"Adjusting to Domestic and International Agricultural Policy Reform in
Industrial Countries"
Philadelphia, PA
June 6-7, 2004

Domestic and International Pressures for European Agricultural Adjustment and Their Implications.

David Colman¹

General economic forces acting upon structural change in agriculture dominate the impacts of changes in agricultural policy. Particular factors are: (1) High demand for land for non-agricultural purposes. (2) High demand for residences in rural areas. (3) Demand for leisure space. (4) Changing occupational expectations and a move away from physical labour.

Structural adjustment in agriculture is a steady process, driven by the enlargement of commercial farms and by the marginalisation of large numbers of smaller farms whose managers increasingly rely on off farm income and part-time operation. The most heavily commercial sector is becoming less dependent upon traditional support and more heavily influenced by the integrated contracts with downstream processors. The rate and direction of farm structure adjustment in the EU is unlikely to change as a consequence of any likely reforms in agricultural policy.

The separation of EU farming into commercial and lifestyle/part-time operations lends itself to a two-track policy, with conservation and amenity output policy concentrated on the latter.

Domestic and International Pressures for European Agricultural Adjustment and Their Implications.

Introduction

There is a fairly conventional list of drivers of agricultural adjustment. On the one hand there are the drivers of agricultural policy reform, which are usually presented as WTO negotiations, environmental and amenity concerns, budgetary constraints and, in the case of the EU, integrating the new member states into the CAP. On the other hand are the general economic and social drivers of change. This raises the intriguing questions of what impact agricultural policy change has on the different sub-structures of the farming sector, and what is the dynamic path of any adjustment. Does, and will further, policy change in the European Union have much impact on agricultural production and the food chain in the EU15²?

The reason the above questions need to be posed, is because in the crowded northern and western countries of the EU general pressures of economic growth and concentration of the downstream supply chain may now be the dominating factors driving agricultural adjustment. Economic growth is driving demand for more roads, housing and country living and forcing up land prices and the opportunity costs of farming. It is enabling well-paid professionals to buy country properties, which would formerly have been classed as farms in a proper sense, but, which despite some continuity of form, no longer deserve to be classed as such. Meanwhile, the concentration at the top of the food chain is forcing commercial farming to increase its scale of operation and integrate into contract chains for just in time delivery. To what extent are commercial farms influenced by the transfer payments of the new agricultural and rural policy, as opposed to new regulatory systems? Also to what extent are the lifestyle holdings of wealthy individuals, which account for increasing areas of land, influenced by policy?

Pressures for further policy reform.

In broad outline the relative influence of the factors shaping policy reform in the EU, beyond those in the Mid-Term Review (MTR) of the Agenda 2000 changes to the CAP, seem fairly clear. Agriculture Commissioner Franz Fischler has frequently reiterated the EU's basic position in the WTO negotiations. The EU has offered to accept a repeat of the 36% average tariff cut in the Uruguay Round, and to cut amber and blue box ceiling expenditures by 60%. The latter should be satisfied by the 2003 Mid-Term Review (MTR) outcome, whereby the single farm payment transferred most of the blue box support to the green box; thus, this should not entail any additional constraint on policy. The EU has stated preparedness to increase the proposed cut in export subsidies generally to 45%, provided parallel treatment is applied to US export credits, but to phase them out for products of particular interest to developing countries (Agra Europe April

2004). At this stage agreement on export credits has not been concluded, and only removing export subsidies of importance to developing countries is on offer currently; something which will require major reform of the EU sugar regime.

The room for further manouevre by the EU before 2014 is heavily constrained by the enlargement process, and the extreme complexities of administering the MTR policy measures already agreed after much hard bargaining. The policy decision to consolidate all direct agricultural subsidies into a single farm payment was agreed in June 2003, with considerable room for subsidiarity in its application to enable the decision to be ratified. Thus the EU is bound to staunchly defend the position that its expenditure on the single farm payment is decoupled, not trade-distorting and that it can be defined as lying in the green box. The new scheme has to be implemented in 2007 at the latest, but some countries (such as the UK and Ireland) will do so in 2005. The UK will adopt a fully decoupled system from the outset, and in that sense the payment will be independent of production, but the right to payment will only be transferable between agricultural producers. Other countries, such as France, will take full advantage of the scope within the scheme for partial coupling of payments; thus 25% of the arable element of any farms single payment will be linked to production, 50% of any ewe premium element within the payment, and 100% of the beef cow suckler premium, etc...

Given the rigid budgetary ceiling on EU agricultural policy costs, the further switch of policy to direct payments, coupled with the costs of enlargement, may well force some further policy adjustments before 2014. The precise nature of these is difficult to foresee, but options include further cuts in intervention and storage aids, and reductions in the direct payments after 2008.

In the UK the scope for subsidiarity has, in the case of the dairy premium element of the single payment, been taken to the point where the devolved national governments have decided on different principles of implementation. Wales and Scotland have both decided that dairy farmers registered in March 2005, should receive the full premium compensation for reduction in dairy product price supports based on production in 2000-2002. England has decided only to assign milk producers 90% of the premium in 2005, transferring the remaining 10% into the pot to be assigned on an area basis to all producers; and it has decided to switch a further 10% per year into the general pot until all the premium is allocated on an area basis by 2012, with every producer receiving the same regional payment per hectare irrespective of past or present production. Northern Ireland has adopted a different "static hybrid" model in comparison to England's dynamic hybrid. To add complexity the single payment itself will be subject to a modulation tax whereby a portion of the payment will be transferred to finance environmental and rural development schemes. Furthermore, the modulation tax itself will be subject to an element of national discretion.

The UK single payment scheme is excessively complicated when taken as whole. When that consideration is extended to the other member states, and takes into account the enlargement agreement issues, it is difficult to see that the EU has much room to radically change policy (beyond that agreed in the MTR) before 2015, except in the area of export subsidies.

Setting domestic EU factors aside, it is not obvious that there is great external pressure through WTO for reform beyond the limiting markers set by the European Commission. The pressure from the USA seems greatly muted compared to that in the Uruguay Round, although moderately bellicose remarks are uttered from time to time. The 2002 Farm Bill has stripped the USA of some of its moral authority on trade liberalisation, and given EU lobbies resisting agricultural reform an easier ride. Furthermore, the Cairns Group seems less strident in its attacks on the CAP. This overall assessment of the relative weakness of external pressure derives some support from Josling (2004). Josling highlights key issues which will have to be resolved between developing and developed countries before progress can now be made. The sort of institutionalised decoupling of support being undertaken by the EU, he sees as necessary to move the CAP reform agenda forward, despite the economic reality being that in practice the single payment will not be incentive neutral³. The USA and EU can no longer manage the WTO agenda to suit themselves, but Josling argues that the developing countries have to accept that policies which are acceptable to developed countries “are not necessarily incompatible with open markets. To make reductions in absolute spending a condition for allowing more market access is risking throwing the baby out with the bathwater”. Thus, at the moment the WTO process appears stalled, and there are obstacles to circumvent before it is back on track.

In the EU, environmental politics plays a large role, and chimes in well with the process of transferring agricultural support from price and market supports to direct payments. The transparency of direct payments facilitates the process of re-targeting those payments towards the production of public conservation, amenity and landscape goods, and the withdrawal of support for output surplus to market requirements. Thus there is the process of progressive modulation (increasing tax of direct payments, with their transfer to rural and environmental payments), and it explains why England opted for a scheme (detailed above) whereby the dairy premium will diffuse into a flat area payment by 2012. The legitimacy of the future CAP is going to depend upon political acceptance that it is a green policy.

The Diminishing Impact of Market and Price Support Policies.

It is conventional wisdom that the long-run elasticity of aggregate agricultural supply response to output and input prices is relatively low (Chibber (1984), Mohan Rao (1989), Binswanger (1989)). The methodology of determining that is complex, and the results not wholly compelling, but the question for current purposes is not with methodology, but rather whether the importance of policy prices may not be declining, and the relative importance of other drivers might be increasing.

All of the references just cited argue that non-price factors are more important in the long-term dynamic than prices. In particular it is technological change, and Cochrane’s treadmill of innovation which enables/causes agriculture to adapt to declining real margins to land by increasing the productivity of labour, non-land capital and

intermediate inputs. This process causes relative declines in output prices, but is sufficient to enable supply to increase in quantity terms. Crucially underlying this dynamic is major structural change, driven by the enlargement of commercial farms in area and capital size and by the marginalisation of large numbers of smaller farms whose managers increasingly rely on off farm income and part-time operation.

Table 1. The Structure of US Agriculture 2001.

Type of Family Farm Operator Households	Number	Share of all Farms	Average Operator Household Income		Share of Value of Production %	Share of Acres %	Estimated Average Acres
			Total	From Farming			
Limited Resource	96,127	4.5	7,666	-3,423	0.5	1.0	100
Retirement	247,230	11.5	47,362	-948	0.8	4.0	156
Residential Lifestyle	943,192	43.9	81,077	-5,669	5.1	15.2	154
Farming Occupation Low Sales	494,490	23.0	35,355	-2,336	7.2	20.2	395
Farming Occupation High Sales	165,472	7.7	51,399	25,273	14.5	18.0	1,042
Large Family Farms	85,098	4.0	69,439	36,964	14.6	17.3	1,948
Very Large Family Farms	62,635	2.9	214,872	181,006	43.7	14.4	2,202
Non-Family Farms	55,440	2.6			13.6	9.8	1,698
All Farms	2,149,683	100			100	100	446

Source: http://www.ers.usda.gov/Data/farmfinancialmgmt/tables/HHF_FT2001.htm

This process of structural change is particularly well documented for the USA, but is mirrored (without the same statistical richness) in Europe, as elsewhere. The USDA

uses the very interesting full classification of farms presented in Table 1. In what it calls its “collapsed” classification even the “Farming Occupation Households with High Sales” are not included in the Commercial Family Farm category. Taking that definition only the bottom three categories in Table 1 are commercial; in 2001 these collectively account for only 9.5% of farm holdings, farming 41.5% of the land, and producing 71.9% of the value of production. The 1,286,549 farming households in the limited resource, retirement and residential lifestyle categories (classed collectively as rural residence farming households) accounted in 2001 for 59.9% of holdings, 20.2% of farmed land, and only 6.4% of the value of output.

Strikingly all three of the rural residence farming households on average made a negative return on their farming operations in 2001, as did the “farming occupation with low sales households”. While comparable data are not available for the EU, or even individual member states, there is every reason to believe that in some respects the position is not dissimilar. The process of concentration is taking place everywhere, and many of the smallest holdings are part-time farms relying on off-farm income. Farming losses are common, even among full-time farmers, when family labour time is costed at hired labour rates. A recent study of UK dairy farmers estimates that in 2002/3 60% of England and Wales dairy farmers made a net income loss from milk production, and that 40% of milk was produced at a loss (Colman et al., 2004a). Comparable figures for the USA, indicate around 30% of milk producers making losses (McElroy et al. 2002, p.39)

From the standpoint of supply response, this increasing concentration in the structure of production probably means a reduction in the importance of price support policies, and therefore a decline in the importance of policy reform itself. (Although farm lobbies will fight hard to hold onto existing subsidies). The commercial farms, which dominate production, have moved away from simple commodity production and increasingly have to be linked into the supply chain to ensure markets for the relatively large volumes they produce. Intervention buying and undifferentiated bulk commodity sold spot, is decreasingly seen as basis for longer-term commercial survival. Contract prices rather than policy support prices are increasingly the crucial consideration, and these can differ appreciably, as exemplified in the UK dairy sector. Nevertheless the direct subsidy payments are important, and despite being formally fully or partially decoupled, will provide funds which can be used to maintain a positive cash flow and investment funds for the farming enterprise. However, with price intervention policies cut back and the switch to decoupled direct payments, the impact agricultural policies on aggregate supply in the EU15 will be greatly reduced. In addition structural change in farming is, it is argued, reducing the sensitivity of supply to changes in such agricultural support policies as exist.

Another factor reducing sensitivity to price policy, as suggested by Howarth (1990), relates to the internal structure of commercial farming units in Europe. He observed that the decline in the number of holdings in the UK was relatively slow and steady, and that a much larger reduction had taken place in the number of hired worker. This reduction in reliance on hired labour, he sees as reducing the sensitivity of farmers to price uncertainty and change. Of course many of the remaining holdings, as in the USA, became part-time, hobby, and retirement operations, thus reducing their dependence on

policy support, while the commercial sector has reduced to a much leaner harder core of committed farmers. Again this can be readily exemplified by the UK dairy industry.

If, as is universally recognised (e.g. Josling and Hamway 1972, Cochrane and Runge 1992 (p.19)) the larger commercial farmers receive most of the support payments, and if commercial agriculture is increasingly concentrated on a declining number of holdings, what basis can there be for suggesting that the influence of agricultural support policy on supply may be declining? One reason for suggesting that is that, although in the USA and EU real farm support has been static or declining for some years, supply has continued to increase in volume for a majority of commodities, and the process of structural adjustment has continued unabated, as indeed it must in response to declining real product prices. The large commercial farms are developing for the long-run, and when particular owners cease production others take their place. Large commercial farms adapt to meet the challenge of declining output to input price ratios, irrespective of whether those declines are caused by policy reform or by basic market forces.

Secondly many of the largest commercial farms, in the USA at least, are not heavily dependent on direct support payments. (In Europe, where the switch to direct payments from price support is occurring later, direct support is set to play a larger role in net farm incomes in the next 10 years or so). However, the picture which is revealed for the USA is in all probability applicable to the EU15 as well. There, as reported in McElroy et al. (2002, p.27), 54% government payment in 2001 was for cash grain and oilseeds, with a further 24% for other crops. Thus relatively little support was for dairy, pigs and other sectors. Consequently many of the largest commercial farms were not heavily dependent upon government transfers. According to the Agricultural Resource Management Survey results reported by McElroy et al., only six percent of the gross income of reporting commercial farms was accounted for by direct payments, as compared to 11% for intermediate family farms, and 15% for rural residence farms. Given that these three classes of farms account for 41.5, 38.2 and 6.4% of production respectively, it is clear that in the USA the dominant commercial sector is less reliant on policy payment transfers, although there are still indirect supports from import restrictions and export credits. True the average direct transfer to those commercial farms receiving payments is much larger than to those intermediate and residential farms receiving payments, because the commodity related payments are based on past production levels.

Even more significant is the difference within the commercial category between very large family farms and non-family commercial farms. The latter, 55,440 in number, contributed 13.6% of the total value of production, but received on average only around \$16,000 per farm, whereas the very large reporting family farms received over \$90,000 (McElroy et al p.28). Clearly this disparity reflects the overall difference in commodity orientation of the two key commercial groups, with the very large family farms heavily engaged in crop production and the non-family farms in less-heavily subsidised products.

From the above casual analysis of the USA situation, it seems reasonable to argue that the most heavily commercial sector is less dependent upon traditional support policies than the residential and smaller family farm sectors, and will be less susceptible to future changes in those policies.

Data is not so readily available for the EU to support the argument developed above, but there are sufficient straws in the wind to sustain it. Using UK data, it is apparent that the bottom line of the agriculture sector account is more heavily dependent upon direct support than in the USA. In 2001 (TSO 2002), total subsidies to agriculture were provisionally recorded at £1.943 billion, which was a 14.7% supplement to gross output at market prices and 49.6% of net value added. With the further switch of some market support to direct payment as consequence of the MTR, those percentages are set to rise. Because all the payments will be wrapped up into a single farm payment from 2007 at the latest, 2005 in the case of the UK and Ireland, there is an immediate question of the impact of this reform on outputs. If the payment is viewed by farmers as decoupled, from the standpoint of incentive to produce, this reform represents a significant cut in support. Divergent views exist about the supply response impact of this. In part the divergence hinges on the question of whether farmers will in fact treat the payment as decoupled, or will continue with business as usual using the single payment to subsidise continuance of their basic farming business. There are those who have argued the latter is probable (e.g. Colman and Harvey 2004b). That view is based on the evidence that many producers are in effect making losses, by accepting rewards to labour and capital that are lower than any plausible assessments of their opportunity costs. However those producers are very slow to respond to economic stimuli, and are resistant to change, so that any supply response by them slowly manifests itself in the longer run.

There are however others who are more acutely concerned about opportunity costs, and will (and are) responding to the reduction of coupled support by stopping dairy farming (as an example) and some are ceasing production early. However, there is no sign as yet that others are not prepared to take their place, either as dairy farmers or producers of other products. The demand for agricultural land remains steady in most parts of Europe, reflecting the intention of many farmers to expand their operation as opportunities arise.

The Influence of Economic Growth.

The general economic forces acting upon structural change in agriculture in Western Europe are very powerful, and may well dominate the impacts of changes in agricultural policy. Particular factors are:

1. High demand for land for non-agricultural purposes.
2. High demand for residences in rural areas, in the UK certainly, and elsewhere.
3. Demand for leisure space (e.g. golf courses, or keeping horses).
4. Changing occupational expectations and a move away from physical labour.

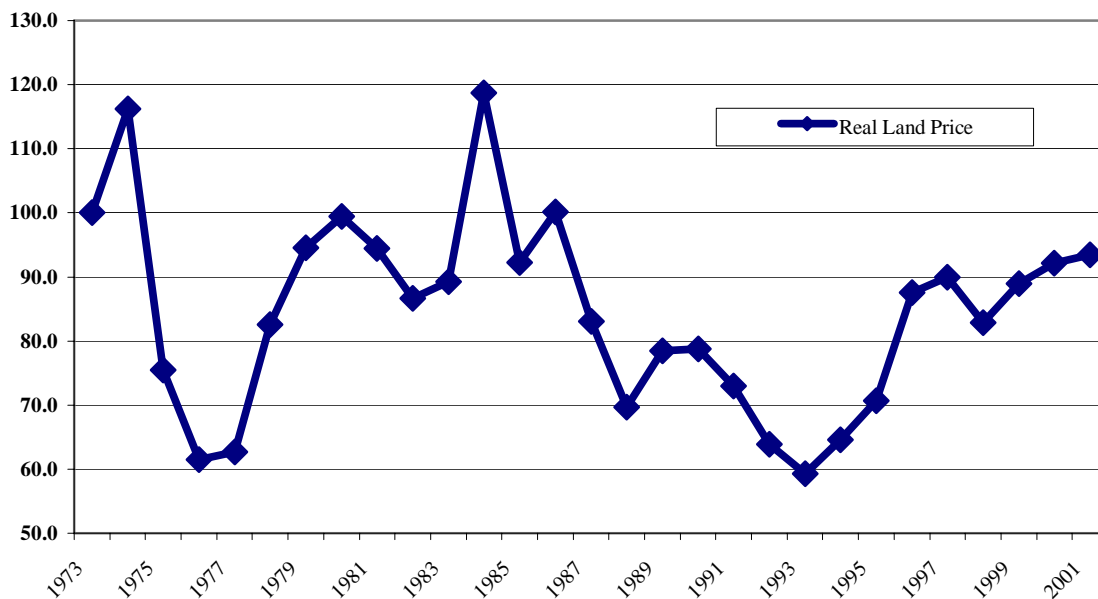
In other words the opportunity costs of farming have steadily risen as the rewards (on an area basis certainly) have been diminishing. At the same time, urban pressures and general income growth have created additional competition for the land resource.

Demand for land. As regards land prices, there are two counter-forces at work. On the one hand low farm incomes are holding down the price of that land with no

alternatives outside agriculture, and in particular land of low grazing quality. On the other hand, the value of properties on the land rise as residential house price inflation (in the UK) runs ahead of general inflation, imparting very high values to land with building permission. There is a very steady annual loss of agricultural land for residential building³. In addition there is some loss to roads and commercial development. The tight controls on change of land use ensure that planning values remain high, especially given the “roll-over” tax provision which removes capital gains tax on land sale profits provided the money is re-invested in agricultural land.

In the UK these two counter-forces have tended to cancel each other out over time. This is shown in Figure 1 by the graph of real land prices⁴ from 1973 (when the UK first joined the European Union) and 2001, the latest figures available. The real price in 2001 is 6.5% below its 1973 starting point on these calculations, but, very significantly, has risen sharply from a low point of 59.3% in 1993 during what has been a sustained period of general economic growth and substantial net farm income decline. Over the period 1900 to 2002 the agricultural area in the UK has shrunk by over 0.3% per year and 3.7% in total. That process will continue, and the latest issue of Farmland Market (2004) confirms higher land prices throughout the UK, with demand strong from residential buyers.

Figure 1. UK Real Land Price Index 1973 - 2001



It is worth noting that agricultural land prices in the UK are certainly not the highest in the EU15. According to data produced by Farmland Market (2003, p.19), they are below those of the Netherlands, the former Western parts of Germany, Belgium, Spain, Italy and Greece. All of these have high population densities, in which pressure for housing, work, and living space place a high opportunity costs on land for agricultural

purposes in many locations. The market response to this pressure leads to the aspects of structural change noted above:

1. More land is taken over by residential and retirement owners. The former are essentially non-commercial and supported by non-farming income and wealth, and the latter have no intention of moving and are prepared to consume their assets.
2. The commercial sector declines in area, and concentrates into larger, more-intensive units. The product mix moves away from cereal and oilseed production (which can be handled by contract field operators, with little input by owners) to higher valued more intensive forms of livestock production and specialist crops. This may be associated by either a decrease or increase in total agricultural output by volume.
3. Increased farming specialisation entails fewer farming enterprises per holding.
4. On farm diversification occurs, with movement into downstream marketing and/or processing and non-agricultural enterprises.
5. More owner-farmers become part-time and take off-farm work, and the amount of permanent hired labour is reduced.

Changing attitudes to farming. Another driver of structural change is the fact that fewer and fewer sons and daughters of farming families are attracted to take up farming. The expansion of higher education, and the lowly status of agriculture as a university subject, has seen increasing numbers of farmers offspring attracted to finance, bio-science, and the professions. The attraction of non-manual professional employment with high regular salaries and holidays diminishes the supply of willing recruits of high academic quality into farming. In itself that is a reflection of economic growth and increases in opportunities. For high-flyers to wish to enter agriculture as a full-time occupation requires farming jobs to provide working conditions increasingly similar to those for middle management in other sectors. There has to be the opportunity for holidays, and remuneration (when adjusted for the values of independence and job-satisfaction) to lead a middle-class lifestyle and educational opportunities for children. It is through increasing enterprise scale, specialisation, and allowing management to withdraw from manual labour which creates conditions to realise these expectations and conditions.

A Possible Way Forward.

Given the structural changes occurring in farm ownership and operating structures in the EU15, a logical policy strategy would be to focus the conservation and amenity elements of environmental policy on lifestyle and retirement farms, and to allow commercial agriculture to evolve subject to a minimal safety net and necessary pollution controls.

At present there is a lack of clarity about the amount of amenity and landscape output from agriculture that society wants. At times there appears to be a presumption that all farmland should produce some positive public goods. This view is exemplified by the current position in England, and in the new pilot “broad and shallow” scheme to be

initiated in 2005 as an “Entry Level Agri-Environment Scheme”. Farms within the pilot areas will become eligible for small area payments if they score a more than a minimum number of points for certain practices, features and outputs. There is clearly an expectation that this may be rolled out across the country, and it appears that some organisations envisage this a step towards a situation where all farms will have to commit to producing positive conservational outputs to receive any public support. That would go beyond requiring farms to minimise pollution and damaging externalities of all types, and to generally practice cross-compliance..

Rather than strive to achieve conservational gain on intensive commercial farms, it would seem more sensible to set out to achieve biodiversity and conservation gain on the lifestyle and residential holdings which are taking over ownership of an increasing share of agricultural land in Europe and the USA. Already in the USA it is possible to interpret Figure 20 in McElroy et al. (2002) as indicating that a disproportionately large share of Conservation Reserve Payments go to retirement and residential lifestyle farms, whereas production related subsidies dominantly go to intermediate and commercial family farms. That division in policy direction seems entirely logical, and recognises that the agricultural sector is not homogeneous, but is recognisably sub-divisible into commercial and lifestyle sectors. As price support policies are whittled away and replaced by direct payments in the process of reform, the scope for targeting support and tying it to the production of positive externalities of all types increases, and the options for achieving conservational and environmental gain according to type of ownership increases.

Future EU agricultural policy reforms may have only small impacts on EU15 agricultural supply, with the exception of the still-to-be-reformed sugar regime and some minor products. Price support policy has and will be trimmed back, and in any case (it is argued here) responsiveness to price intervention policies is small and declining. To the extent that the single direct farm payment is decoupled, future reductions in it to meet budgetary disciplines should have only small impacts on supply and trade. That should enable the EU to be creative in pursuing an environmentally focussed agricultural land use policy, buttressed by regulations to control pollution by the intensive end of the farming structure.

NOTES

¹ David Colman is Professor of Agricultural Economics in the School of Economic Studies; University of Manchester; U.K. He can be contacted at david.colman@man.ac.uk

² Of course there is going to be substantial change in the newly joined EU14 countries.

³ That is certainly the view of Colman and Harvey (2004b).

³ Source Defra: e-Digest of Environmental Statistics, October 2003.

⁴ The land price series is the MAFF/Defra series derived from Inland Revenue returns for tax purposes. These are deflated by the Retail Price Index for June of each year, taken from the Office of National Statistics monthly series, chained in 1986.

References.

Binswanger, H. (19889), *How Agricultural Producers Respond to Prices and Governmental Investments*, The World Bank, Washington D.C.

Chibber, A. (1984), *The Aggregate Supply Response in agriculture: A Survey*, The World Bank, Washington D.C.

Cochrane, W.W., and C.F. Runge (1992), *Reforming Farm Policy: Towards a National Agenda*, Iowa State University Press, Ames.

Colman, D., J.E. Farrar and Y. Zhuang (2004a), *Economics of Milk Production 2002/3*, Report to Defra and NAWAD; Farm Business Unit, CAFRE, School of Economic Studies, University of Manchester.

Colman, D. and D. Harvey (2004b), *The Future of UK Dairy Farming* a Report to Milk Supply Chain Forum, <http://www.dia-ltd.org.uk/>

Defra (2004), *Entry Level Scheme*
<http://www.defra.gov.uk/erdp/reviews/agrienv/entrylevel.htm>

F.M. (2004), *Farmland Market* 61, Farmers Weekly in association with RICS, Sutton, Surrey. UK.

Howarth, R.W. (1990, 2nd Edition), *Farming for Farmers?*, Hobart Paperback 20, The Institute of Economic Affairs, London.

Josling, T. E. (2004), "After Cancun: What Next for Agricultural Subsidies", *Eurochoices* 2(3), 12-16.

Josling, T.E. and D. Hamway (1972), Chapter 4 of *Burdens and benefits of Farm-Support Policies*, Agriculture Trade Paper no.1, Trade Policy Research Centre, London.

McElroy, R., R. Strickland, J. Ryan, C. McGrath, K. Erickson and W. McBride (2002) *Agricultural Income and Finance Outlook*, Electronic Outlook Report from the ERS, USDA.

Mohan Rao, J. (1989), "Agricultural Supply Response: A Survey", *Agricultural Economics* 3, 1-22.

TSO (2002), *Agriculture in the United Kingdom*, The Stationary Office, London.
