European farmers – adapting to climate change

A changing climate will significantly affect the future of the agricultural sector in Europe. A new report shows that management practices are important factors in reducing the impacts of a changing climate.

Researchers compared climate data with farm performance data\(^1\) across the EU\(^2\), also taking into account policy, land use, size and intensity of farming, in order to investigate the effects of climate variability and change on agriculture at both regional and farm type levels. The study used temperature and precipitation (rainfall, snowfall) data as indicators of trends and variability in the climate and crop yields and farm income as indicators of farm performance.

Five crops, wheat, grain maize, barley, potato and sugar beet, were chosen because different crops are affected in different ways by the climate. Farm income reflects both the direct effects of climate on crop yields, as well as any changes made in adapting to a changing or variable climate. Results showed that:

- prevailing climatic conditions significantly influence farming, which suggests that regions with similar climates adapt in similar ways
- the influence of climate on the variability of crop yields and incomes is more significant at the regional level than farm type level; at farm type level, farm characteristics play a greater role
- temperature has a significant influence on the trends in crop yields across regions, but management and policy decisions can alter this impact
- individual changes in temperature have a bigger impact on crop yields than average temperatures over a period of time
- different precipitation patterns affect crop yield trends more than temperature variability does
- variation in crop yield, as a result of rising temperatures, does not necessarily cause variation in income
- Mediterranean regions are not necessarily more vulnerable than other regions. Income is higher and increasing faster in Mediterranean areas, even though crop yields are generally lower. This implies farmers are adapting to the variable conditions by, for example, reducing input costs, changing crop varieties, irrigating more crops and using more subsidies
- variable precipitation adversely affects wheat and barley yields, but not maize, sugar beet and potato yields as these are usually irrigated crops. Droughts are more likely across all regions of Europe unless water resources are adequately managed.

Researchers suggest that studies to assess the vulnerability of European agriculture to climate changes need to include those farm characteristics, policies and socio-economic circumstances that affect farm management decisions, because adaptive strategies can moderate the impacts of changing climatic conditions.

1. Regional and farm type data were obtained from the Farm Accountancy Data Network (source: FADN–CCE–DG Agri and LEI) from 1990 to 2003. The FADN provides extensive data on farm characteristics of individual farms throughout the EU15. See: http://ec.europa.eu/agriculture/rica/index_en.cfm.
2. The 15 member countries of the European Union before the extension in 2004.


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