

Science for Environment Policy

Fertiliser tax of €0.05–0.27 per kilogram calculated for France as incentive to limit its use

A tax of €0.05–0.27 per kilogram (kg) of fertiliser could help to limit French farmers' use of fertiliser driven by the high rapeseed prices resulting from biofuels policy, according to new economics research. This, in turn, may limit fertilisers' environmental impacts, such as water pollution, the study's authors suggest.

Farmers seeking to make the most of high crop prices may increase the area of land farmed with a valuable crop and also apply more fertiliser. These two changes can have negative environmental effects, such as [water](#) pollution caused by nitrogen run-off, [biodiversity](#) loss due to land-use change, [air pollution](#) from fertiliser and the release of [greenhouse gases](#) through changes in [land use](#). In the past decade, biofuel policies have been a major driver of rising prices for biofuel crops around the world, such as rapeseed, corn and soy.

A tax is one possible policy tool to encourage more limited fertiliser use. This study calculated how big a tax would have to be to curb French farmers' demand for fertiliser for rapeseed, even if this crop's price increases. France is the world's seventh largest consumer of fertilisers and the study's authors point out that water pollution by nitrates and pesticides is a major concern here; in 2013, only 48.2% of France's surface water resources met the EU's [Water Framework Directive](#) criteria for 'good' or 'very good' quality.

There is a pesticide tax in France of €0.90–5.10 per kg of pesticide (the exact rate depends on the type of pesticide), but currently no fertiliser tax (although, in 2013, the French president announced a possible VAT increase on fertiliser).

To estimate an effective fertiliser tax rate, the researchers modelled how farmers' fertiliser use will change in response to rising rapeseed prices, up to 2020, under the influence of the EU's [Renewable Energy Directive](#) on rapeseed prices.

For this assessment, the researchers assumed that 7.7% of fuel used in the transport sector would be first-generation biofuels¹, which are directly produced from food crops, such as rapeseed. Their model also considered the effects on farmer behaviour of [Common Agricultural Policy](#) subsidies to promote set-aside land.

The model used in this study was based on the researchers' observations of the behaviour of around 500 farmers in the department of Meuse, north-east France, between 2006 and 2009. During this period, rapeseed prices increased by 19% in Meuse (compared with the French national average of 7%) and the farmers here increased the area of land used for rapeseed by 18.5% and increased their expenditure on fertilisers by 88% — although there was also a sharp increase in the cost of fertiliser during this period. The percentage of farmers with set-aside land fell from 86% to 59%.

The researchers drew on previous studies which have produced different estimates for price rises for rapeseed oil driven by biofuels policies. If rapeseed prices increase by 9%, as suggested by one 2007 study², then fertiliser demand in France will go up by 1.9%, the model indicates. To overcome the implied increase in demand, a tax of €0.05 per kg of fertiliser is appropriate, calculate the researchers.

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Contact:
basak.bayramoglu@grignon.inra.fr,
raja.chakir@grignon.inra.fr

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1. This figure comes from the scenario considered in Louhichi, K., Valin, H. (2012). Impact of EU biofuel policies on the French arable sector: a micro-level analysis using global market and farm-based supply models. *Review of Agricultural and Environmental Studies*. 93: 233–272.

2. European Commission. (2007). *The impact of a minimum 10% obligation for biofuel use in the EU-27 in 2020 on agricultural markets*. Brussels: European Commission Directorate-General for Agriculture and Rural Development.

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3. Louhichi, K., Valin, H. (2012). Impact of EU biofuel policies on the French arable sector: a micro-level analysis using global market and farm-based supply models. *Review of Agricultural and Environmental Studies*. 93: 233–272.

At the other end of the scale, another study³ estimated that biofuels policy will increase rapeseed prices by 43%. Under this scenario, a tax of €0.27 per kg of fertiliser would overcome a potential 7.68% increase in fertiliser demand. These tax rates are similar to those in some other European countries; Sweden, for example, applies a tax rate of €0.19 per kg of nitrogen fertilisers.

Although the researchers' estimates are based on just one group of farmers from one French department, they say that the data on fertiliser use are representative of many regions in France.

Other calculations from the study suggest that high rapeseed prices may encourage farmers to expand production of this crop at the expense of barley and set-aside land, which is important for biodiversity. Pesticide demand is also estimated to rise with higher rapeseed prices, by 0.33–1.6%, depending on the crop price.

