

Without Pesticides, One-Fifth of Norway's Population Could not be Fed in a Crisis

International Pesticide Benefits Case Study No. 22, September 2011

Leonard Gianessi and Ashley Williams

The population of Norway is about 5 million people. The difficult agricultural environment (harsh climate, mountainous terrain) contributes to a high cost of agricultural production [1]. Norwegian farmers enjoy the highest state subsidies in the world. 60% of their income comes from state subsidies. Norway currently imports about 50% of its food (energy-basis). The share produced in Norwegian agriculture increased from less than 40% in the 1950s to 50% today due to increased yields and production of wheat (Figure 1) [2]. Cereal crops (barley, wheat and oats) account for 75% of the crop acres in Norway.



Norwegian wheat field

Improved weed control with herbicides has been a major factor in increased cereal production in Norway [3]. By 1970, chemical weed control was practiced on 75-80% of the total cereal area in Norway. The resulting yield increase was estimated at 60,000 tons of grain annually (+10%) [3]. Recent surveys of Norwegian farmers show that more than 90% of the acres of cereal crops are treated with herbicides [4] [5]. In addition, about 75% of Norway's wheat acres are sprayed with fungicides and 20% are sprayed with insecticides.



Danish humanitarian aid to Norway during WWII

Food security has been a central part of Norwegian agricultural policy since after the Second World War. Norway experienced food shortages and rationing during the War. The Norwegian government has cited potential future crises including international conflicts, blockades, trade sanctions, environmental disasters like climate change, radioactive fallout, or major shifts in global demand and food supply as threats to adequate food imports for Norway [1].

The Norwegian Agricultural Economics Research Institute developed a self-sufficiency model to estimate the ability to be self-sufficient in various crisis scenarios and at different assumptions of input supply [1]. Human nutrition experts developed a crisis diet for minimum human energy needs. The model estimated that the rate of self-sufficiency in Norway could increase from 50% to 96% with readjustments in the diet and production (more land used for crops) with a normal supply of inputs [1] [2]. However, a scenario of no pesticide use resulted in a self-sufficiency ability of only 81% [6].

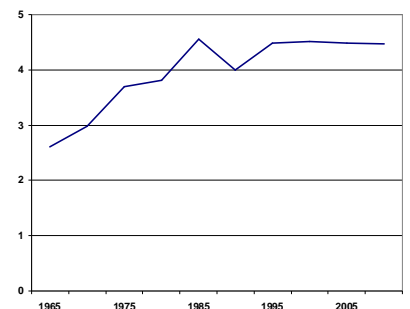


Figure 1: Norwegian Wheat Yield, Thousand Kg/Ha (5 Yr. Avg.) Source: FAO

References

1. Flaten, O. and S. Hisano. 2007. Food security policy in a food importing country: the case of Norway. *Nougyou to Keizai (Agriculture and Economy)*. 73(8):129-136.
2. Flaten, O. 2001. Food security and international trade: the Norwegian case. 77th EEAE Seminar/NJF Seminar No. 325. August 17-18, 2001, Helsinki.
3. Jakobsons, P. 1970. *Norwegian Weed Control Experiments*. FAO International Conference on Weed Control, June 22- July, 1 Davis, California.
4. Statistics Norway. 2009. Crops and Area Sprayed (Chart) . Available at: http://www.ssb.no/jordmil_en/arkiv/tab-2009-11-23-01-en.html
5. Statistics Norway. Available at: <http://statbank.ssb.no/statistikkbanken>.
6. Flaten, O. 2001. *Multifunctionality: Applying the OECD Framework, a Review of the Literature on Food Security in Norway*. Organization for Economic Co-operation and Development.