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GM Crops Good for Swedish Farm Economy

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Report Highlights:
Growing GM crops in Sweden would be economically beneficial for Swedish farmers, according to a recent report from the Swedish Institute for Food and Agricultural Economics. Four GM crops that could possibly be grown in Sweden are covered in the report: rapeseed, corn, potatoes and sugar beets.

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Gene Technology Beneficial for Swedish Farmers

There is no cultivation of Genetically Modified (GM) crops in Sweden today but prospects for future cultivation look good. According to a recent report from the Swedish Institute for Food and Agricultural Economics (SLI), cultivating GM crops would be economically profitable for Swedish farmers. SLI is a government agency commissioned to carry out economic analyses within the fields of agriculture, foods and fishing. The report compares the economics of growing conventional crops versus GM crops. Translated from Swedish, its title is "Cultivation of Genetically Modified Crops- An Alternative for Swedish Farmers?"

Four GM crops that could possibly be grown in Sweden within the next 10-15 years are covered in SLI's report: rapeseed, corn, potatoes and sugar beets. The markets for these products would be the feed industry (rapeseed, corn), the starch industry (potato) and the bioenergy industry (sugar beets, rapeseed and corn).

The report concludes that growing GM crops instead of conventional crops would result in a 4-12% profitability increase for Swedish farmers. The largest benefit is noted for potatoes. It is stressed in the report, however, that possible costs for co-existence measures such as safety distances between GM and conventional fields are not considered in the analyses. In order to avoid the unintended presence of GMOs in conventional and organic products, the European Commission has published guidelines on co-existence for different types of farming. EU member states shall, based on the Commission's guidelines, develop national strategies and best practices for co-existence. The Swedish government has adopted its national framework for co-existence measures but detailed rules are yet to be decided by the Swedish Board of Agriculture. Hence, costs for co-existence measures have not been considered in the analyses due to lack of data. For the same reason, possible costs for special regulations on damage compensation have not been considered. The economic analyses are based on foreign data, mostly from Canada and the US.

Rapeseed Analysis

Rapeseed is the most important oilseed in Sweden. Production has been steadily increasing the past five years and amounted to about 220,000 metric tons in 2006. The rapid growth in Swedish biodiesel production is expected to further increase the production of rapeseed.

According to SLI's report, growing herbicide tolerant rapeseed in Sweden would improve the profitability per hectare by 4-8%. Higher costs for seed would be outweighed by higher yields (6-11%) and reduced cost for herbicides, please see table 1 below.

Table 1. Profitability Comparison: Herbicide Tolerant Rapeseed - Conventional Rapeseed

	Conventional Rapeseed	Herbicide Tolerant Rapeseed	Impact on Profitability
Harvest	2,175 kg/ha	2,305 kg/ha	+ SEK 189-347/ha
Cost for seed	SEK 580/ha	SEK 928/ha	- SEK 348/ha
Cost for herbicides	SEK 385/ha	SEK 59/ha	+ SEK 326/ha
Difference			+ SEK 167-328/ha

1 USD equals SEK 7.70

Corn Analysis

Very small acreages are used for corn in Sweden. The small amount of corn produced is used for farm feed and according to SLI's report, Swedish dairy farmers are showing increased interest in growing corn for feed. With current production methods, however, costs for weed control are high. Reduced costs for weed control would indeed be the largest economical benefits with growing herbicide tolerant corn in Sweden, please see table 2 below.

Table 2. Profitability Comparison: Herbicide Tolerant Corn - Conventional Corn

	Conventional Corn	Herbicide Tolerant Corn	Impact on Profitability
Cost for seed	SEK 1,050/ha	SEK 1,160/ha	- SEK 110/ha
Cost for herbicides	SEK 600/ha	SEK 188/ha	+ SEK 412/ha
Reduced glyphosate treatment in following crop*			+ SEK 290/ha
Difference			+ SEK 592/ha

1 USD equals SEK 7.70

* Glyphosate treatment in corn allows for reduced treatment in crops to follow.

Potato Analysis

Swedish potato areas amount to about 30,000 hectares. Starch potatoes are grown on about 30% of these.

Fungus attacks create severe problems for Swedish potato growers. According to SLI's report, potato cultivation accounts for about half of total fungicide consumption in Sweden while it accounts for only 3% of the agricultural area. The biotech company Plant Science Sweden has developed a fungicide resistant potato through gene technology. Field trials have been taking place since 2006 but it will take at least ten years before this variety could be available for commercial growing.

SLI's economic analysis of growing GM potatoes in Sweden is a rough estimate based on a number of assumptions, e.g., zero fungicide use for the GM potato. Further field trials are needed in order to get more accurate data. Nevertheless, SLI's analysis shows that growing fungicide resistant potatoes in Sweden would improve the profitability per hectare by 6-12%. The largest benefit comes from reduced cost for fungicides.

Table 3. Profitability Comparison: Fungicide Resistant Potato and Conventional Potato

	Conventional Potato	Fungicide Resistant Potato	Impact on Profitability
Cost for seed	SEK 7,500/ha	SEK 8,250/ha	- SEK 750/ha
Cost for fungicides	SEK 2,085-3,005/ha	SEK 0/ha	+ SEK 2,085-3,005/ha
Cost for spraying	SEK 1,120-1,680/ha	SEK 0/ha	+ SEK 1,120-1,680/ha
Difference			+ SEK 3,205-4,685/ha

1 USD equals SEK 7.70

In 1996, Amylogen HB applied for approval of a GM starch potato intended for industrial use. The Commission has proposed to approve this potato for cultivation. It was up for voting in the Article 30 Committee in December 2006 but the necessary qualified majority for or

against approval was not reached. The next step is a Council vote. If the Council fails to reach a qualified majority, the Commission can then go ahead and approve the product.

Sugar Beet Analysis

Swedish sugar production is restricted by EU's quota system. Under this system, Sweden can produce up to 325,700 metric tons of white sugar. Currently, the Swedish sugar industry (Danisco Sugar AB) applies a GMO-free policy but is willing to reconsider its policy should consumers demand sugar produced from GM beets.

According to SLI's analysis, growing herbicide tolerant sugar beet in Sweden would improve the profitability per hectare by about 10%.

Table 4. Profitability Comparison: Herbicide Tolerant Sugar Beet and Conventional Sugar Beet

	Conventional Sugar Beet	Herbicide Tolerant Sugar Beet	Impact on Profitability
Area need*	100%	90-95%	+ SEK 481-918/ha
Cost for seed	SEK 1,600/ha	SEK 1,938/ha	- SEK 338/ha
Cost for herbicides	SEK 913/ha	SEK 188/ha	+ SEK 725/ha
Cost for spraying	SEK 420/ha	SEK 280/ha	+ SEK 140/ha
Reduced glyphosate treatment in following crop**			+ SEK 290/ha
Difference			+ SEK 1,298-1,735/ha

1 USD equals SEK 7.70
* The yield increase for GM sugar beets is estimated at 5-10%, which means that less area would be needed to fill the quota. Estimate includes saved costs for not growing sugar beets on the released area as well as the opportunity value for the released area.
** Glyphosate treatment in sugar beet allows for reduced treatment in crops to follow.

GM Crops for Industrial Use First Out?

Based on SLI's economical analyses, Swedish farmers might very well chose to grow GM crops in the future. The economical incentives seem to be there. The hindering factor can be fear of negative consumer reactions, which is also the reason for Swedish farmers' limited use of imported GM feed. In fact, Swedish farmers imposed a voluntary ban on GM feed more than 10 years ago. In 2006, however, Swedish livestock farmers decided to abolish the ban while Swedish dairy farmers chose to maintain it. This policy shift was attributed to the increasing cost of sourcing GM-free soybean meal. According to SLI's report, the price per kilo for GM-free soybean meal is about SEK 0.10-0.15 higher than GM soybean meal. The price difference might increase as GM-free soybean supplies decrease, which would further increase the cost for "GM-free" animal production. However, the first GM crop to be grown in Sweden will most likely be intended for non-feed and food industries, such as the starch and bioenergy industries, where consumer attitudes are of less importance.