

Environmentally safe and consumer-friendly potato production in The Netherlands. 2. Certifying potato production systems

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Summary

The introduction of a green label 'Agromilieukeur' for ware potatoes in The Netherlands has been realised in close cooperation between all parties involved: growers, consumers and environmentalist organisations. Cropping procedures and performance indicators were developed by the Centre for Agriculture and Environment (CLM). Preliminary results of implementing the standards by potato growers in 1995 are discussed.

Introduction

It has been established that researchers and farmers gained experience in low input farming by implementing the results from new research methods for an environmentally safe potato production (Spiertz et al., 1996). Simultaneously, consumer organisations reflected on research prospects by formulating qualifications for an environmentally safe potato production. This paper presents a survey on these developments.

Public concern

Public concern formed a catalyst. In The Netherlands the Consumers' Association and the environmentalist movement joined forces. Their former policy was to convince the government by reacting against the traditionally strong political lobby of the agricultural industry. Nowadays the joined forces of consumers and environmentalists address themselves directly towards the market and agribusiness. In 1990 they launched a slogan 'boycott certain Dutch potato cultivars which are poisoning the environment' (Van Sambeek, 1990). The impact of the slogan surpassed national borders. For example at the 12th EAPR-conference in Paris, German researchers of the Rostock University (Gall, 1993) referred to the 'Gifpieper Actie' of Dutch environmentalists and consumers.

Policy

Strategies for pesticide use reduction activities in The Netherlands were laid down by the government in an Agricultural Structure Memorandum in 1989. These strategies

were translated into concrete policies, measures and targets, which resulted in a national 'Multi-Year Crop Protection Plan' (MYCPP, 1991). This programme is comparable to the Danish and Swedish legislation mandating reductions of 50% or more in the total use of pesticides by the year 2000 (Hurst et al., 1993; Matteson, 1995). Farmers were the group on which the Dutch plan imposed the largest number of mandatory requirements. But in 1993, the Dutch government and the agricultural industry conceded to an Administrative Agreement on the implementation of the MYCPP. This agreement expresses responsibility for implementation of the plan to the agricultural sector itself. The EU-Directive on nitrate of 1991 formed a directive for a strategy to minimize the leaching of nitrates to the environment.

Goals on pesticide use

The MYCPP consists of the following objectives for pesticide use:

- reduced dependence on chemical pesticides;
- reduced use (volume of active ingredients) of 50% by the year 2000;
- reduced emissions to soil and groundwater by 75%, to surface waters by 90% and to the air by 50% by the year 2000;
- withdrawal and/or regulation of environmentally harmful pesticides;
- improvement of labour protection.

The use of pesticides will be regulated with regard to the protection of groundwater, surface water and soil. The MYCPP consists of tentative lists of pesticides to be withdrawn. The lists are based on criteria and standards for leaching to groundwater, persistence in the soil and acute toxicity on water organisms. For example, the quality of groundwater used for drinking-water is defined by a directive which determines the maximum content of pesticides to be 0.1 µg per litre water for each pesticide and 0.5 µg per litre water cumulative for all pesticides. The MYCPP-standards have recently been adjusted to the EU-standards, such as the Uniform Principles.

Goals on fertilization

Most environmental problems resulting from minerals are caused by nitrogen and phosphates. These substances play a role in acidification and fertilization of the environment, e.g. accumulation in the soil, pollution of groundwater and eutrofication of surface water. The objective for nitrogen is to reduce ammonium emissions of 1980's level by 70% and to reduce the pollution of water with nitrates. The EU-Directive 91/676/EEC for drinking water determines a maximum content of 11.3 mg N per litre of groundwater. The objective for phosphate is to reduce phosphate emissions of 1985's level by 75%, the avoidance of its accumulation and a maximum permissible concentration of 0.15 mg phosphate per litre for surface water.

Mutually agreed activities

Ecological agriculture has improved its marketing procedures. Producers, distributors and retailers formed one chain under a biological trade mark. In 1991 the EU-Council adopted a regulation (nr 2092/91) that settled uniform European quality standards for biological and ecological products. Many European countries have programmes that offer subsidies for ecological farming and assign a state controlled label (e.g. Denmark). Nevertheless, the majority of the farmers are not willing to change radically their way of farming. Conventional agriculture has not changed growing procedures enough and supermarkets are reluctant to sell to their clients the more expensive potatoes, even when consumers are willing to pay a higher price.

Out of the conflict between farmers and environmental organizations in 1990, a new approach was born: producers, traders, environmentalists and consumers agreed on goals for sustainable agriculture in a Covenant in December 1993. They agreed that the policy of the government towards agricultural sustainability should be considered as the democratically-agreed directive for the definition of standards. Priority was given to goals for reducing the use of pesticides and minerals.

In some other European countries similar developments took place. For example in Switzerland Migros-supermarket started to impose mandatory requirements on farmers to grow environment-friendly products. The level of environmental quality of Migros products lies between biological (zero pesticide) and conventional. Since then, other supermarkets, including COOP-Switzerland copied this approach but improved substantially the level of safety for the environment by increasing the severity of production requirements.

Cropping protocols

Simultaneously with formulating objectives to minimize the impact of agriculture and horticulture on the environment, consumer preferences were identified. One of the earliest wholesale dealers that considered public concern for the environment seriously and of strategic importance, was supermarket Albert Heijn (AH), the largest grocer in The Netherlands. AH consulted CLM in 1989. Since then, CLM developed a strategy for farmers to minimize the burden on the environment. A step-by-step approach is being implemented. Each year cropping protocols are assessed in relation to their feasibility and effectiveness, and adapted if necessary, to attune to changing views and desires. In 1994, over 2000 ha were grown with the aim of meeting the standards of the protocols, and 77% of the growers were able to meet the standards set for the different varieties (De Vries, 1996). It is Albert Heijn's intention to ensure that all its suppliers of potatoes, vegetables, fruit and mushrooms grow and produce their products according to the protocols. In future imported fruit and vegetables will be included. A contract with the supermarket is an incentive for growers to change their farming practices.

The consumer places reliance on a safe product. Field inspection of the production

phase gains importance. Control means sanctioning in extreme situations; farmers who unaccountably ignore the standards and regulations will be sanctioned. In the event that external factors such as weather cause a failure, the farmer would be punished undeservedly. For AH, extension and selection of growers are more important. The farmer as principal actor will produce extra 'environmental-interest' during good weather; during bad weather he will produce less. In both seasons the growers' effort is registered and the environmental quality is recorded. An impartial judgement of the environmental performance is assured by CLM. The Dutch Consumers Association and environmentalists' organizations are informed of the results, the effectiveness of the cropping protocols and their impact on the environment.

Green label

Certifying potato production systems and produce quality offers farmers and consumers a method to meet criteria based on mutual agreement. Early in 1995, the Dutch Consumers' Association and the environmentalist movement agreed with the farmers' representatives and the Commodity Board for Potatoes on a green label called 'Agro-milieukeur' (De Vries & Den Boer, 1995). The label 'Agro-milieukeur' for potatoes fills the gap between conventionally produced potatoes and the much more expensive organically grown potatoes. Its philosophy is that a label which does not set too high a threshold will appeal to a much larger group of producers and consumers than a label with very strict criteria and corresponding high costs. In organic farming a small group of growers is making a large step towards environmentally-friendly cultivation. Though important, this is not sufficient. Environmental certification offers an opportunity of making a somewhat smaller step to a much larger group, which will eventually lead to much larger environmental benefits. In close co-operation with producers, consumers, environmentalists, traders, researchers and government representatives, CLM developed criteria and standards for this label. A goal-oriented approach for solving environmental problems, such as clean groundwater, was chosen.

Standards and performance indicators

Table 1 shows the standards for the green label. The use of active ingredients of pesticides is restricted to a limit, defined so as to reduce the total use by 50% compared to the use of pesticides during 1984–1988. The growers' choice of pesticides is restricted to a list of selected materials with limited harmful effects on the environment. For example, spraying Ridomil is prohibited. Additional regulations on application equipment contribute to the preventional emission. Other standards for the green label include fertilization. Maintenance of the standards is assured by independent certified inspection agencies.

To evaluate environmental performances, monitoring instruments were developed

Table 1. Standards of the green label for potato production.

Theme	Criteria	Standard
Pesticides	use of active ingredient '95 use in 1996 use in 1997 impact on the environment	maximum of 8 kg a.i./ha max. of 7 kg a.i./ha max. of 6 kg a.i./ha restricted to a list of selected pesticides which have a limited impact on the environment
Emissions	measures to be taken	application by aeroplane is prohibited obligatory use of special nozzles at the edge of the field regular obligatory adjustment of application equipment prohibition of pesticides use within 0.5 m of a ditch
Minerals	surplus of nitrogen phosphate	N-surplus for the total cropping plan is limited the phosphate content of the soil determines the maximum amount of P-fertilizer to be used
Emissions	measures to be taken	regular obligatory overhaul of application equipment prohibition of fertiliser use within 0.5 m of a ditch

such as:

- account of nutrient flows on farm level to assess the mineral surplus per ha and emission of plant nutrients;
- yardstick for pesticides, which assigns 'environmental impact points' to each pesticide application with regard to leaching and acute effects on the aquatic and terrestrial ecosystems (Reus & Pak, 1993).

Environmental yardstick for pesticides

As the principal actor, the farmer needs a clear standard which he has to meet and an indicator which shows the impact of measures he takes. CLM developed the Environmental Yardstick for Pesticides. The yardstick enables farmers to choose pesticides with the least harmful effect on the environment. Using the yardstick the farmers can compare the environmental effects of their way of farming with that of other growers. At the same time farmers are able to measure the progress they make towards a more environmentally sound crop protection.

The yardstick assigns 'environmental impact points' to each pesticide with regard to leaching into groundwater, acute effects on water organisms and effects on soil organisms. The more points attributed to a pesticide application, the higher its impact on the environment. The points are calculated using computer models describing the emission of pesticides into groundwater, soil and surface water and their biodegradation. The effects on water and soil organisms are estimated by comparing

the exposure concentration with toxicity data. The environmental impact points are assigned for a standard dosage of 1 kg/ha. If a different dosage is used, farmers would multiply the number of points by the dosage applied.

Preliminary results of green label potato production

On 600 ha in 1995, over one hundred potato growers produced, in co-operation with trade organizations, about 20,000 tonnes of green label warepotatoes for the table stock market. Schuitema, a supermarket chain in The Netherlands, and several specialized retailers sold the entire harvest. The crop was grown under strict regulations following the standards of the green label for potato production 'Agromilieukeur'. The evaluation of this first season, carried out by CLM in collaboration with the inspection agencies, produced preliminary results on the competitiveness of the crop, on the farmers' opinions on yield (De Vries & Den Boer, 1995) and on the benefit for the environment (De Vries, 1996).

The crops were competitive. Within this environmentally sound cropping system the control of *Phytophthora infestans* was effective. The growing season was favoured by dry and hot weather but even in a more humid season farmers will be able to control *Phytophthora infestans* because the green label list of selected pesticides contains semi-curative fungicides. If necessary, farmers are allowed to kill the haulm with a herbicide that kills the *Phytophthora*-spores also.

Farmers and trade organizations were satisfied with the quality and the yield produced. In an inquiry, 88% of the green label potato growers indicated that they will continue applying this cropping procedure.

The green label potato growers applied 70% less pesticides than in conventional farming, mainly because they controlled weeds mechanically and because they destroyed haulm mechanically. Since the green label-potato growers had to choose from a restricted list of selected pesticides, the risk of disturbance to the aquatic and terrestrial ecosystem was decreased to less than 10% compared to the risk in conventional potato production.

When we compare the results of organic farming with the AH-farmers, the latter proved to be advanced: already in 1994 900 ha potatoes (in 1995 1070 ha) produced for AH met the standards with a maximum of 8 kg a.i. pesticide per ha, whereas biologically grown ware potatoes in The Netherlands accounted in 1995 for 600 ha only. These potatoes are produced without synthetic pesticides.

Discussion

A green label for ware potatoes is an opportunity for farmers to gain reward for their environmental performance. It also shows prospects for traders, because it can play an important role in the promotion of quality potatoes that are environmentally safe and consumer-friendly.

A green label for potato production shows prospects for the sector, if both design (formulating standards) and implementation in the market chain is an interactive process of producers and consumers.

It would be interesting to know whether the described initiatives of the potato sector in The Netherlands are satisfying in the opinion of society. A report prepared by seven Dutch environmentalists' organizations stated that the potato crop remains highly dependent on chemicals. Nevertheless they admit that a group of trendsetters is moving ahead. Today the group is yet too small compared to the 118,000 ha of potatoes in The Netherlands (Bloem, 1996).

At present supermarkets play a key role in the process of enlarging the production of each of the described initiatives, viz. biological label, green label and cropping protocols.

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