

# Agricultural Policy and Water Protection

**Switzerland has a leading role in Europe with the reform to its agricultural policy, and in particular with the Proof for Ecological Performance as prerequisite for direct payments. The area-wide measures within the Proof for Ecological Performance meanwhile have positive effects on water quality. Focus points for further improvements to water quality include providing more space to watercourses and reducing local phosphorus excesses in soil.**

Increased food self-supply to avoid shortages in times of war and crisis was the aim of Swiss agricultural policy in the postwar period till the end of the 1980s. This was a continuation of the “Wahlen Plan”, proposed by federal minister Friedrich Traugott Wahlen during the Second World War, to guarantee the Swiss population with a reliable food supply. Instruments of this policy included fixed prices and supply guarantee for important agricultural products. The Swiss confederation intervened with threshold prices for imported produce, customs duties, quotas and cost covering acquisition of excesses. By the end of the 1980s, this policy was reaching its limits: costs were increasingly burdening the federal budget, consumer tourism abroad was rising, and efforts to liberalize world trade as part of the GATT agreement (General Agreement on Tariffs and Trade) and the later WTO (World Trade Organization) considerably increased the pressure to bring down the protectionist measures which were favoring Swiss agriculture. In addition, the environmental deficits of agriculture were becoming more evident. Agriculture-derived phosphorus inputs in inland lakes were resulting in excessive algae growth and severe oxygen depletion – some lakes had to be artificially aerated to sustain life – and in many drinking water reservoirs nitrate levels were rising alarmingly.

## Reorientation from 1993

In the Seventh Agricultural Report in 1992 [1], the Swiss Federal Council identified the limits of the adopted agricultural policy and proposed a reorientation, which has been successively implemented since 1993. The

core of the reform was to separate price and income policies and to introduce product independent direct payments as recompense for agricultural performances which are of common and ecological interests. To achieve the environmental targets, the Federal Council fixed a hierarchy of priorities in the Seventh Agriculture Report for the following, currently effective, strategies:

- Research, education and consulting: farmers should be able to act in an environmentally sound manner based on their own knowledge and conviction.
- Creation of financial and other incentives: an environmentally sound management must also be economically viable.
- Additional regulations and guidelines in different areas.

The focus of agricultural policy since 1993 has been point 2 of this strategy. On 9 June 1996, the public and the parliament included a new agricultural article [2] in the constitution. Since then, the confederation is obliged to ensure that agriculture, via sustainable and market-oriented production, contributes substantially to secure an adequate food supply for the population, the maintenance of the natural life resources, the care of the rural landscape, and a decentralized settlement of the countryside. The confederation subsidized the farmers' income through direct payments with the aim of a fair and appropriate recompense for the provided services. Prerequisite for this is that agricultural enterprises provide a Proof for Environmental Performance (PEP). In addition, the confederation promotes economic incentives for production forms which are particularly natural, environmentally and animal friendly. The ecological

dimension of sustainability becomes, thus, an important objective of agricultural policy.

## Direct Payments Since 1999

Since 1999, the constitutional article has become effective law [2]. The proof for environmental performance covers:

- husbandry of livestock in animal-friendly conditions,
- a regulated fertilizer balance,
- a suitable proportion of ecological compensation areas,
- a regulated crop rotation,
- suitable soil protection,
- the choice and targeted use of plant treatment products.

Of particular importance for water protection is the promotion of a regulated fertilizer balance. It demands, on the one hand, that farmers do not apply more nitrogen and phosphorus than the cultivation and pasture require. On the other hand, for environmental compensation, unfertilized grass verges should be provided alongside waterbodies of at least 3 m width (Fig. 1) and along paths of at least 0.5 m width. Such green strips reduce the input of fertilizers and auxiliary agents into waterbodies.

## Additional Water Protection Measures

In 1994, federal ministers Ruth Dreifuss and Jean-Pascal Delamuraz commissioned a workgroup with the task of defining targets and measures for the reduction of nitrogen emissions [3]. Using model calculations for the future agricultural policy of Switzerland, the workgroup came to the conclusion that the then current measures – the reduction of produce prices, direct payments and the consistent execution of the Swiss Water Pollution Control Law and the Swiss Ordinance on Environmentally Hazardous Substances – were insufficient to achieve the desired water quality in all locations.

More far-reaching measures could be necessary, for example, in areas with groundwater resources which are impacted by an increased nitrogen runoff resulting from

agricultural activities. Through Article 62a of the Water Pollution Control Law [4], in 1998 the Federal Parliament created an instrument for improving the quality of ground and surface water bodies exposed to agricultural emissions through targeted financial incentives to farmers. Article 62a of the Water Pollution Control Law provides the confederation with the means of adding federal subsidies to the contributions of cantons or third parties in support of agricultural policy measures. The requisite funds would be provided through direct environmental payments in accordance with the agricultural law. The emphasis is on reducing nitrate loads in ground water and phosphorus loads in surface waters. Included are also measures designed to prevent contamination of water bodies by plant protection agents.

### Reducing the Nitrate and Phosphorus Loads

According to the Water Pollution Control Ordinance, the cantons are obliged to delineate inflow areas for above ground and underground water catchments, and to impose remedial action in case of insufficient water qualities. Such measures can have significant constraints with regard to land use and, thus, lead to unsustainable financial consequences for the farms. If the measures, however, are integrated into a project, finance can be requested from the confederation. It can be up to 80% of the total costs for structural and management adjustments, and up to 50% for technical production measures. In 2003, around 4 million Swiss francs were allocated.

Typically, problem solving is based on local measures, which can be defined in cooperation with the agricultural stakeholders. Of particular suitability for environmental measures are meadows and arable land with green crop rotations. Since 1999, 18 nitrate and three phosphorus projects have been submitted and approved. They are located in the cantons of Aargau, Berne, Freiburg, Lucerne, Solothurn, Schaffhau-



Fig. 1: A 3-m wide green strip reduces the input of fertilizer and plant protection agents into waterbodies. Worble in Canton Berne.

sen, Vaud and Zurich. Further nitrate and phosphorus projects, and a project in the westerly part of Switzerland dealing with plant protection agents are in the planning stage.

### Positive Results in the First Pilot Projects

The first pilot projects in accordance with Article 62a of the Water Pollution Control Law are currently being completed. After 6 obligatory project years, the results are consistently positive. For example, the nitrate project around the drinking water catchment of Frohberg in Wohlenschwil (Canton Aargau) was started as a pilot project in 1996 and has been funded by the con-

federation since 2001. It covers a catchment area of total 102 hectares. 62 hectares of these are agricultural land, encompassing 12 farms. The use of around 50 hectares is controlled by a drinking water contract. It contains strict, multi-year restrictions on the application of nitrogen-containing mineral and waste fertilizers as well as farm manure, and cultivation restrictions for crops with large runoff potential. In addition, there are far-reaching constraints on soil processing and crop rotation:

- the extension of the utilization period for temporary pastures,
- conversion to extensively used and unfertilized meadows,
- direct sowing of grassland,

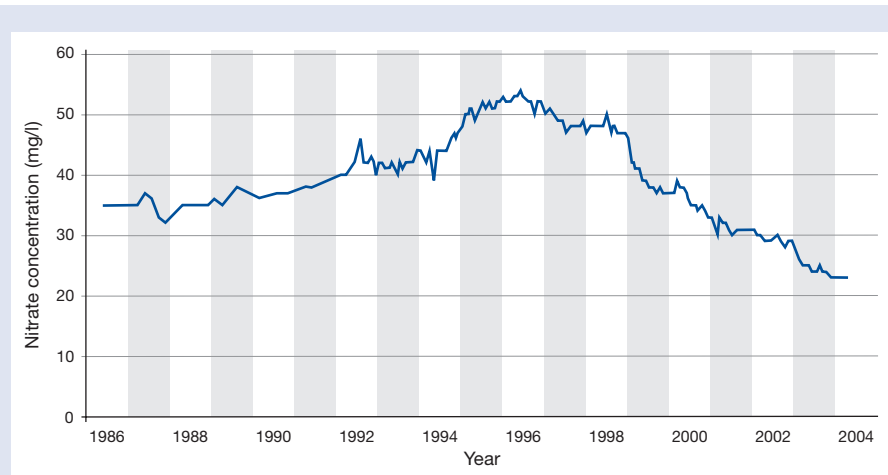


Fig. 2: Change in nitrate content in the Frohberg source in Wohlenschwil, Canton Aargau. The source is located in a project area in accordance with Article 62a of the Water Pollution Control Law [3].

Agroecological area	Measured parameter	Basis	Goals 2005
Agricultural processes: ecological total impact tolerance	N balance	96 000 t N (1994)	Maintain the nitrogen loss potential to the level of 74 000 t N per year. This corresponds to a reduction of about 22 000 t N (circa 23%) compared to the 1994 level.
	P balance	About 20 000 t P (1990/92)	Reduction of P excess by 50% to around 10 000 t P. This level was maintained.
Agricultural practice (consumption)	Plant protection agents	About 2200 t active agents (1990/92)	Reduction of the total applied plant protection agents by 30% to around 1500 t active agents.
Effects on the environment	Nitrate		In 90% of the drinking water catchments, where inflow areas are used by agriculture, the nitrate levels are below 40 mg/l.

Tab. 1: Goals of the Swiss Agricultural Policy till 2005, N = nitrogen, P = phosphorus.

- rotary band seeding of maize,
- direct sowing of winter cereals and
- limitations in free range husbandry of pigs.

These measures have resulted in a reduction of nitrate concentrations to below the target level of 25 mg/l (Fig. 2). If this success in nitrate reduction is to be maintained with certainty, the measures must be continued.

## Agricultural Policy 2007

On 1 January 2004, the Agricultural Law of 1999 was revised for the first time. The agroecological aims relevant for water protection, which should be achieved by 2005, are summarized in Table 1 [5].

One aim is the reduction of environmentally relevant nitrogen losses from agriculture by 22 000 t to 74 000 t per year by 2005 starting at the 1994 level of 96 000 t. This target will most likely not be achieved. Although the nitrogen emissions between 1990 and 1998 have fallen, they increased again in 2002. For nitrate, on the other hand, it appears that the target will most likely be achieved. Various investigations indicate a trend in this direction. In addition, the measures according to Article 62a of the Water Pollution Control Law are showing their effectiveness within the nitrate projects. The aim, to reduce the applied quantity of plant protection agents to 1500 t per year, has already been achieved. The environmentally relevant phosphorus losses may not exceed 10 000 t per year. This target has also been achieved, in fact already by the mid 1990s. Regions with high concentrations of livestock remain problematic, and in these areas phosphorus excesses still need to be reduced.

The Federal Office for Agriculture therefore, in conjunction with a workgroup, has developed a recommendation for the reduction of the phosphorus excess. The solution is based on the following principles:

- Remedial action will be undertaken where problems exist.
- The principle behind remediation is oriented on the procedure laid down by Article 62a of the Water Pollution Control Law. Thus, the cantons have both the responsibility and the room for action. The confederation participates subsidiary.
- Monitoring on the basis of the agroecological indicators reveals whether the measures are producing the desired results.

## Watercourse Policy Model Switzerland

In a broad co-operation, the Federal Offices for the Environment, Forests and Landscape, for Water and Geology, for Agriculture and for Spatial Development, have designed guiding principles for Swiss watercourses [6, 7].

This document should provide guidelines for a sustainable strategy for water policy on all management levels. Three development objectives stand in the foreground:

- adequate space for watercourses,
- adequate water flows,
- adequate water quality.

In particular the development goal “adequate space for watercourses” is a great challenge for agriculture. Sustainable flood protection and the demands which a watercourse must meet for its environmental functionality, can only be achieved where a sufficiently large area is allocated to the watercourse. This requires innovative solutions to satisfy all the stakeholders involved.

## A Glance over the Border

Despite intensive consultation and financial support via state-sponsored environment and support programmes, the agricultural sector in the European Union (EU) remains the main source of widespread pollutant inputs to waterbodies. This is particularly

the case for nitrate and plant protection agents. At the end of June 2003, the EU agricultural ministers passed a fundamental reform of the Common Agriculture Policy, which will change the support mechanisms of the Union’s agricultural sector. The environmentally relevant core points of the reform are:

- Decoupling financial assistance from production. In the coming years, most assistance schemes will be provided independently of production volumes. The link to production can be maintained to a limited degree, to avoid production shutdown.
  - The new single operative payments will in the future be linked to respecting environment, food safety and animal welfare standards (“Cross Compliance”). Agricultural businesses will be subject to an annual audit. Cross Compliance is fundamental for the area-wide protection of waterbodies and soil.
  - Reduction of direct payments to big enterprises (modulation). Thus, funds will be freed for the development of regional areas with new programmes in the fields of environment, quality and animal protection.
- Compared to the EU, Switzerland takes a leading role in the protection of waterbodies from agricultural inputs through the Proof for Ecological Performance and the regional programmes.



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