



# IMPACCT CASE STUDY No. 8

Integrated Management Options for Agricultural Climate Change Mitigation

## Siechnice Horticultural Production – Siechnice, Poland

This case study is based on a moderate sized (72 ha) business growing crops under cover. Siechnice lies approximately 13 km south-east of the regional capital Wrocław in the Silesian Lowland region. The region has a transitory, temperate climate with cold winters.

The main crops include 14 ha of tomatoes, 5 ha of cucumbers and 5 ha of ornamentals. As well as 24 ha of glasshouses, the farm has 15 ha of permanent lawns, a pond and several buildings.

The site has produced bottled water that is drawn from a deep well. Groundwater is close to the surface lying between 0 and 2m deep.



Enterprise Location

The company retails its own produce and is a member of two assurance schemes.

1. Quality Certificate TUV CERT of system HACCP in production, storage and distribution of tomatoes and glasshouse cucumbers, since 2003; and
2. GLOBALGAP Certificate referring to food safety (GHP, GMP, HACCP) and its identification; environment protection; health, safety and protection of workers (BHP) and livestock, since 2008.

The company was also awarded the 'Perspicuous Firm' in 2009 by Dun and Bradstreet, Poland in cooperation with partners



Aerial view of the business, Photo: Wrocław University

The company have adapted their practices and policies significantly in recent years for both economic and environmental reasons. Some of these activities include:

- Ensuring glasshouses are more energy efficient and insulated. Glass has been re-sealed with new silicone and new plastic windows installed. This has cost around €25,000 per ha but has reduced energy consumption by 10-15% and so reduced greenhouse gas emissions.
  - In 2007 six new glasshouses were built to high energy efficiency standards. These glasshouses use around 30% less energy than the older ones.
  - Farm tractor use has been optimised to save fuel and gaseous emissions.
- In 2007, new, more efficient pumps have been installed to circulate warm water for heating the glasshouses. These pumps use 30% less energy compared with the old ones they replaced and so less greenhouse gas emissions are produced.

- Since 1990 the company has used hydroponics for much of its tomato production. This has removed the need for soil cultivation and soil pests and diseases are no longer a problem. This has reduced labour and the use of fuel, pesticides and steam for soil disinfectant. Using steam as a soil disinfectant is a very energy intensive process. There has been a significant increase in productivity. Tomato yield has improved from 15 kg/m<sup>2</sup> in soil to 45 kg/m<sup>2</sup> under hydroponics.
- Water efficiency measures have also been adopted and all glasshouse crops are watered using drip irrigation. Prior to 1990, when this was implemented, crops were irrigated using sprinklers.
- The drip irrigation is also used to deliver nutrients direct to the crops. This has improved the nutrient phytoavailability and contributed to the increased yields.
- Since 1995 the company has used biological pest control as a first defence against pests and diseases. On occasions this does not offer sufficient protection and chemical pesticides are required to protect yields. However, the use of chemical pesticides has been significantly reduced, saving energy and the associated emissions from pesticide manufacturer.



**Tomatoes under glass**

Original case study content collated by Wroclaw University of Environmental and Life Sciences

