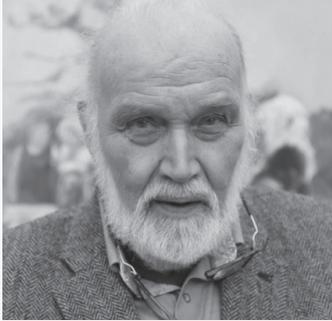




RESEARCHER PROFILE

A NEW BIOLOGICAL
PESTICIDE FOR AGRICULTURE

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SVEIN LILLEENGEN has been a farmer in organic, dairy and vegetables for the past 30 years. His research career began in the 1990s upon developing Bioskiva, a disc that prevents weeds from growing close to *Brassica* plants. This disc was awarded a patent in 1991, and Lilleengen subsequently went on to establish Bioskiva AS in 1997. He has also worked within electronics and marketing for 12 years and completed three years of Engineering studies at the Malmø Tekniska Institute.

RESEARCH GOALS

Farmers and gardeners in Europe, the US and Russia have a problem, and its name is *Delia radicum* – commonly known as the cabbage fly. *D. radicum* is a seemingly innocuous little insect similar in appearance to the common house fly. Unlike its domestic relative, however, it has an insatiable appetite for plants in the genus *Brassica*, including cauliflower, broccoli, cabbage and rutabaga. The fly lays its eggs in close proximity to these plants and, when they hatch, the larvae migrate to the roots of the vegetables to feed and grow for around three weeks before pupating. The process destroys these often economically valuable plants, with gardeners and farmers losing more than half of their *Brassica* crops this way if left untreated.

Agricultural researcher Svein Lilleengen has witnessed this problem firsthand. With more than 30 years of experience as a farmer, much of which has been spent collaborating with others in the industry, he has gained an insight into the impact of *D. radicum* and the most popular ways to negate it. Organic farmers use various kinds of nets to keep the flies away, a labour-intensive and costly solution that is not always effective. Conventional farmers, on the other hand, use pesticides – but because of concerns over food safety, there is currently no pesticide fully approved for use on these farms in Scandinavia. The negative health effects of these endocrine-disrupting chemicals are estimated to cost over €150 billion a year in Europe. “New ways of protecting the crops without harming the environment or people’s health had to be developed,” Lilleengen explains.

METHOD

Lilleengen’s research career began in the 1990s. At that time, he began to run a biogas plant to look for ways of using the resultant fibrous byproducts. In 1991, he patented the Bioskiva – a disc, 12 cm in diameter, made from the fibrous remnants of cow dung. The Bioskiva was designed to be placed around the stalk of the *Brassica* plant, preventing weeds from growing up in close proximity to the crop. This invention was soon followed, in 2002, by an odourless, pelletised fertiliser derived, similarly, from cow manure.

FertiBug, successfully patented in 2014 based on research funded by the EU’s Seventh Framework Programme (FP7), is the most innovative of Lilleengen’s environmentally friendly inventions. Designed to repel cabbage flies without killing them or using toxic chemicals, FertiBug combines solid fertiliser based on the fibrous byproducts of biogas production with a certain algae that the flies cannot stand – resulting in a product that nourishes *Brassica* plants at the same time as protecting them. “The very first inspiration was an academic article saying algae could be used much more in agriculture,” the Norwegian farmer recalls.

IMPACT

FertiBug has already attracted attention from the public at large. Lilleengen has been approached by newspapers and broadcasters from around the world – to date, he has taken part in five TV programmes in Norway, one in Spain and one in the UK. He has also been visited by the Norwegian Government’s Committee for Energy and the Environment, and invited to tea by Harald V – the king of Norway.

The efficacy of FertiBug as a product has also been dramatic. Greenhouse tests of the repellent-cum-fertiliser showed that it discouraged around seven in every 10 flies from laying their eggs on plants to which it had been applied, but field trials in Spain and Hungary conducted in 2011 were even more positive, demonstrating a 100 per cent repellent effect. Consequently, Spanish crops of Savoy cabbage saw a 50 per cent increase in yield per hectare, and the Hungarian fields were between 20 and 80 per cent more productive.

These statistics back up the attributes that make FertiBug so appealing to farmers; quite simply, it is sustainably produced, environmentally friendly and very effective. As one of the farmers involved in Lilleengen’s tests remarked: “I’ve never had a crop of cabbages so beautiful as the plot treated with FertiBug pellets”. New EU rules coming into effect in the coming years will ban the use of around 20 different pesticides – and the arrival of FertiBug on the market will no doubt have a big impact. Always ready to add to the product’s green credentials, Lilleengen plans to produce only the algae for FertiBug on site at Bioskiva AS; the raw materials, he says, will be sourced at biogasplants for local use in Europe, reducing emissions and improving sustainability.

Fertibug

Organic insect repellent

