

The biobed – a Swedish farmer's invention used across the world



Figure 1. The biobed was invented by Swedish farmer Göran Ohlsson. He constructed the first biobed on his farm Norregården, outside Lund. The biobed is effective, simple and cheap to build. Educationally and functionally, it is unbeatable.

The biobed is an invention by Swedish farmer Göran Ohlsson to minimise surface water pollution and point-source pollution in areas where spraying equipment is filled or washed. It is a simple, efficient and cost-effective concept, based on the principle of pesticide biodegradation.

In 1992, Swedish farmer Göran Ohlsson had the idea of building a biobed¹. The reason was his concern about how to reduce point-source pollution originating from filling and washing of spraying equipment. He had learned that chemical pollutants can be broken down by normal microorganisms in agricultural soil. He therefore constructed a simple pit, just over half a metre deep, filled with a mixture of straw, soil and peat. The idea of using this mixture came when he was helping his wife to change the soil in their greenhouse. The bottom layer of the biobed he constructed consisted of a 10-cm clay layer to give an impermeable base and a mixture of 50% straw, 25% soil and 25% peat was used to fill the pit. A grass cover was then established on the top and a driveway with a mesh grid was laid. Excess water from the biobed was conducted to a collection well, from where it was possible to recirculate it back to the biobed.

The mesh grid placed on the top made it possible to use the biobed for parking, washing and filling the sprayer, to avoid point-source pollution from any accidental spillage. To find out whether his construction and idea was correct and whether the mixture of materials used was appropriate, Göran Ohlsson contacted researcher Lennart Torstensson at the Swedish University of Agricultural Sciences, who was interested in this new system and started to analyse its function. After several tests, he came to the conclusion that pesticides were degraded sufficiently in the biobed and that it worked so well that when the biobed mixture needed to be replaced, the old material could be spread on farmland. Lennart Torstensson also tested other mixtures, but the original mixture that Göran Ohlsson had used proved to be most efficient.

¹The name "biobed" was coined by Sven Norup, who was the first manager of Odling i Balans.

During the 1990s, biobeds were constructed on a number of other farms in the Odling i Balans [Farming in Balance] network and the biobed concept was also taken up in the sugar beet industry's environmental management programme. Under the Swedish subsidies system (REKO), farmers received a subsidy for establishing a biobed on their farm. The farm demonstration network, Odling i Balans have then been an important tool that have been used to spread the biobed concept to other farmers in Sweden and in the world.

Göran Ohlsson's biobed invention has now spread to many countries worldwide, where farmers have adopted the original biobed concept or have refined it for their conditions². There are more than 9000 biobeds in existence today, according to delegate contributions at an international biobed workshop organised by an international biobed network in 2016. There are about 6030 biobeds in use in Europe and about 3100 in Guatemala and Costa Rica, with an additional 99 established in the rest of the world.

As well as being effective, the biobed is simple and cheap to build. It is thus an example of good agricultural practice. Educationally and functionally, it is unbeatable. It collects pesticide residues in wash water or in spillages during refilling and retains and degrades these residues. It can also be used to test the function of tubes and nozzles on the sprayer.

Installing a biobed

- Use 25% by volume of topsoil, 50% by volume of chopped straw and 25% by volume of peat.
- Use chopped straw, to give many surfaces for microorganisms to live on and to make mixing easier.
- Mix the biomix well and moisten the material so that it is held together.
- If possible, use topsoil from fields previously treated with pesticides.
- If the bottom layer is not dense, an enclosed biobed is required. In that case, dig the pit about 80 cm deep and line the base and walls with waterproof sheeting.
- Make the biobed large enough so that any residues from washing, filling and rainfall running off the sprayer during parking are captured in it.

The location of the biobed is important; according to Swedish recommendations should it be placed at least 15 m from the nearest well or watercourse.

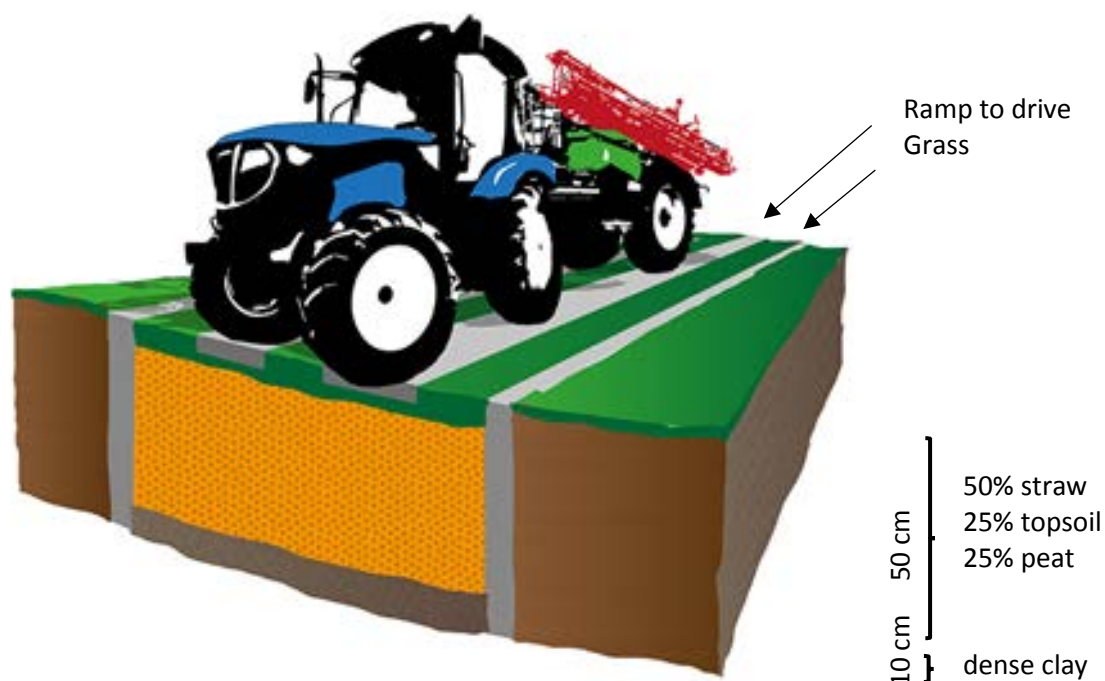


Figure 2. Illustration of the original Odling i Balans biobed. It was built with a 10 cm layer of dense clay on the bottom, and then 50 cm of a biomix consisting of chopped straw, topsoil and peat. A ramp is placed on the top for driving on. The top is covered with grass. Illustration, Hans von Corswant

²There are also other English names for the biobed, e.g. biofilter, biomass bed, biodep, Vertical Green Biobed etc.

Maintenance of the biobed

- The biomix needs to be replaced with fresh material regularly, since it will decompose and compact.
- The biomix needs to be replaced every five to eight years, depending on function and climate.
- The grass layer needs to be in good condition, since it controls the water content.
- It is beneficial to mix in some old biomix after replacing the bed material
- If there is a long period without rain, the biobed should be watered.



Figure 3. Swedish farmer Göran Ohlsson invented and constructed the first biobed in the world, to obtain a system that reduces point sources of pollution from pesticide spillage. He was also one of the initiators of Odling I Balans (Farming In Balance), a demonstration farm network. OiB was founded in 1991 when it was registered as a nonprofit organization. Development and projects conducted in close cooperation with a number of pilot farms in Sweden.

Building a biobed: An example from Norregården, an Odling I Balans farm



Figure 4. A 60 cm deep pit is excavated and 10 cm of dense clay is placed on the bottom.



Figure 5. A mesh grid is positioned on top, so that the biobed can be used for parking, washing and filling the sprayer, to avoid point-source pollution from any accidental spillage.



Figure 6. A mixture of 25% by volume of topsoil, 50% by volume of chopped straw and 25% by volume of peat is moistened, mixed and packed into the pit. The top is sown with grass. (Photo to the left)

Other biobeds in use at farms in Odling I Balans



Figure 7. Field biobed on Hacksta farm, Sweden.



Figure 10. Yard biobed on Broby farm, Sweden.



Figure 8. Sprayer parked on the biobed on Wiggeby farm, Sweden.



Figure 11. The biobed gives the farmer opportunity to see whether the weed pesticides preparation works or not, Broby farm.



Figure 9. Sprayer being reversed onto the biobed on Hidinge farm, Sweden.

This is an updated version of the first brochure about the Odling i Balans biobed, from 1992. Odling i Balans (Farming In Balance)

www.odlingibalans.com

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More information:

<https://www.youtube.com/watch?v=xc7ZZGerSOY>

<http://www.biobeds.org/sites>

<http://www.biobed.co.uk>

Odling i Balans aim is to develop Swedish crop production from a holistic view point so that economy and ecology are in balance. Issues such as an optimal and sustainable fertilization strategy, the use of an integrated pest management (IPM), a soil conservation strategy, an energy efficient production and a quality production with as less losses to water, and air as possible including minimizing climate gas emissions. OiB works also with projects with the aim to promote biodiversity on farms.