



## Bean Seed Fly

The bean seed fly (*Delia (Phorbia) platura* Meigen) is a globally distributed pest that infests numerous host plants. In soybeans, the seeds are destroyed by the larvae before germination or the young seedlings are eaten bare before they even penetrate the surface. Damage occurs mainly with slow germination due to cool, damp weather or too deep placement of the seeds. Larval populations are generally largest in fields with a high level of organic matter (Purdue University Cooperative Extension Service, 1999). The best control measure is sowing at the optimum time with warm, dry weather - also for the days after sowing!

### Biology

The bean seed fly is found on all continents (except Antarctica). First it was described in Germany and then spread via America to Asia, Africa and Australia. In total, there are more than 40 host plants that *D. platura* can infest, including not only soybeans but also corn, peas, potatoes, melons, strawberries or onions.

The larvae of the bean seed fly (Fig. 1) are whitish yellow, up to 6 mm long and pupate in a dark brown cocoon in which they can also hibernate. In spring the adult fly hatches. It is grey-brown and with 5 mm about the same size as the larvae. Freshly applied organic matter attracts the flies for egg deposition. A female can lay 40-80 eggs from which the larvae hatch after about 10 days and start to eat the (soy) seedlings. Some 2 weeks later the larvae pupate again and after 1-2 weeks the adults hatch. In total, there can be up to 4 generations per year (DLR RLP, 2016). The subsequent generations are not relevant for soybean cultivation, except for

the last generation of the year, whose larvae hibernate in their cocoons and lay their eggs in the following year.



Figure 1: Larvae of the bean seed fly, Taifun 2011.

### Symptoms

The infested beans do not emerge or emerge very poorly, so that a patchy stand can be observed (Fig. 2). On the beans themselves you can find the holes drilled by the larvae which destroy the seedling (Fig. 3). If infested seedlings still manage to emerge, feeding spots can be observed.



Figure 2: Patchy soy stand due to infestation with bean seed fly, Taifun 2012.



Figure 3: Feeding damage on seedlings/beans, Taifun 2011.

## Control

The most effective control method is the optimum sowing time. Too deep sowing in combination with cool temperatures leads to a delayed emergence and thus favors the infestation by the bean seed fly. With the correct sowing depth and rapid emergence the bean seed fly usually is no problem.

Direct control of the bean seed fly is not possible. Since the main part of its life cycle takes place below the soil surface, natural enemies can be neglected. In the case of a large-scale infestation, reseeding is the only possibility - however, in any case the development of the larvae must be observed beforehand in order to prevent a renewed failure.

From the University of Wisconsin there is even a smartphone app that, in order to avoid sowing during hatching, calculates the degree days and thus the risk of infestation (University of Wisconsin 2016). The main part of the first generation hatches after about 200 degree days (threshold value 3.9°C) and lays eggs. Based on the degree days, it is then possible to calculate approximately when the main reproduction will take place and to adjust the sowing if possible.

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Another discussed factor is fresh organic matter. The application of fresh organic matter and the direct neighborhood to it should be avoided in order not to attract the adult population

Thus, even the careful handling of crop residues helps to prevent the adult animals from egg deposition (Kessing and Mau, 1991). Fields with ploughless tillage also have a lower risk of infestation (Pope, 1998).

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