

## Test of traps for Turnip moth (*Agrotis segetum*)

### Purpose

In this project we wanted to do a practical test of two different traps for Turnip Moths as an alternative to the Danish trap for Turnip moths.

### Background:

During the last 3-4 decades a special Danish design of a trap for Turnip moth has been used to forecast egg-laying in vegetable crops. In the mean time other types of traps has been introduced and implemented in other European countries. One is the Funnel traps from UK. Another one is the TrapView from Slovenia. The Danish designed trap is based on tests, where researchers at Copenhagen University have observed how wide the opening in the trap should be to let the Turnip moths land directly in the trap at the pheromone lure. The trap works well but is not easy to handle in the field. Maybe there are some advantages in traps like the new TrapView or the Funnel trap that has been implemented in a lot of European countries.

### TrapView:

TrapView consists of a trap house with a camera inside that takes pictures of the sticky floorboard in the “house” once a day. The pictures can be seen on the website: [www.trapview.com](http://www.trapview.com). This should be an easier way to monitor turnip moths without driving to the traps and therefore make it quicker to warn to the growers.

Test in 2015 taught us that

- the plastic trap house is not strong enough to hold the camera,
- it's difficult to change the sticky boards,
- the traps do not last long when changing the sticky boards often,
- the sticky boards, that comes with the TrapView, is too weak to capture and hold the moths.

We also found that when there are many moths on in the trap, it's difficult to count the Turnip moths on the picture – especially when there are many other moths in same size and colour.



### Funnel traps:

In UK and other European countries a special designed funnel trap is used for monitoring turnip moths for warning of cutworm attack in root crops like carrots. The traps called Funnel traps are designed, so they are easy to maintain and empty for moths compared to the Danish designed traps with sticky floorboards traditionally used in Denmark. Originally it was designed to contain some insecticide in the bottom of the bucket. Today sticky paper is placed on the inside the bucket of the funnel traps to re-train the moths. The sticky paper is not as sticky as in the DK traps, but enough to prevent the moths from escaping the traps.

Green Funnel traps were tested in 2014 with different combinations of lures but with disappointing results – maybe because of the lures from UK. In 2015 the Funnel traps were used again in the field test. This time with the same lures as used in the DK traps and this time with yellow Funnel traps. In 2015 the catch was more or less the same in the Funnel traps as in the DK traps – sometimes a little bit less moths in the Funnel traps. Maybe because the Funnel traps were hanging a little bit lower than the DK traps. The two traps were setup in the same type of metal poles but because the Funnel traps are hanging in a string, they were closer to ground level than the DK traps.



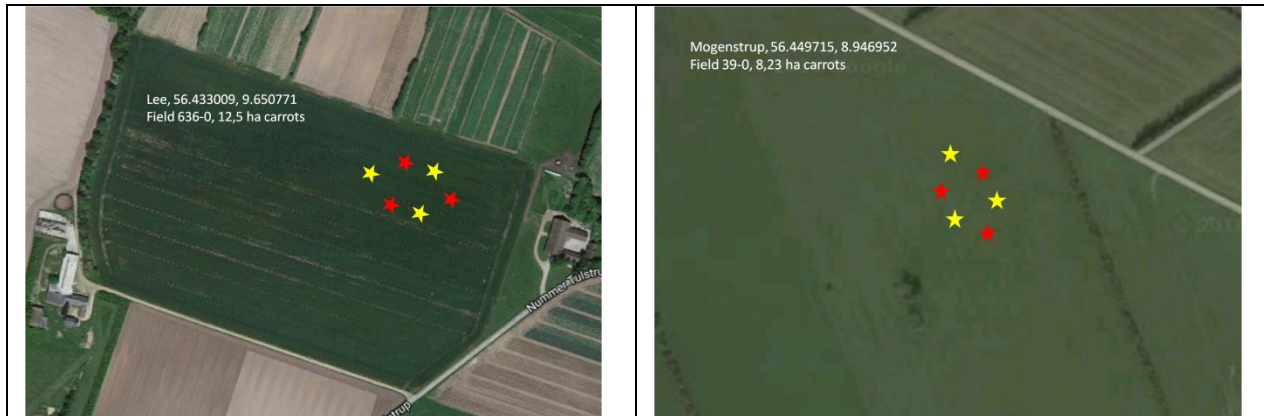
#### Danish traps:

The trap traditionally used in DK is much more open and designed to make it easy for the moths to fly directly to the pheromone lure. The open design makes the traps more sensitive to rain, strong wind and birds stealing the insects on the sticky board. The sticky board in the trap needs to be changed once a week in the season. The glue on the board is very sticky, so to make sure all moths landing on the board will be retained. That also makes it a bit dirty job to change the boards.



#### Test plan:

In two fields DK traps and Funnel traps were set up in the season for Turnip moths monitoring. The metal poles holding the traps were constructed so the traps were placed in the same height over the ground. They were placed in the field with at least 50 meters distance in between as shown in the picture. Both traps were tested with the lures normally used in Denmark.

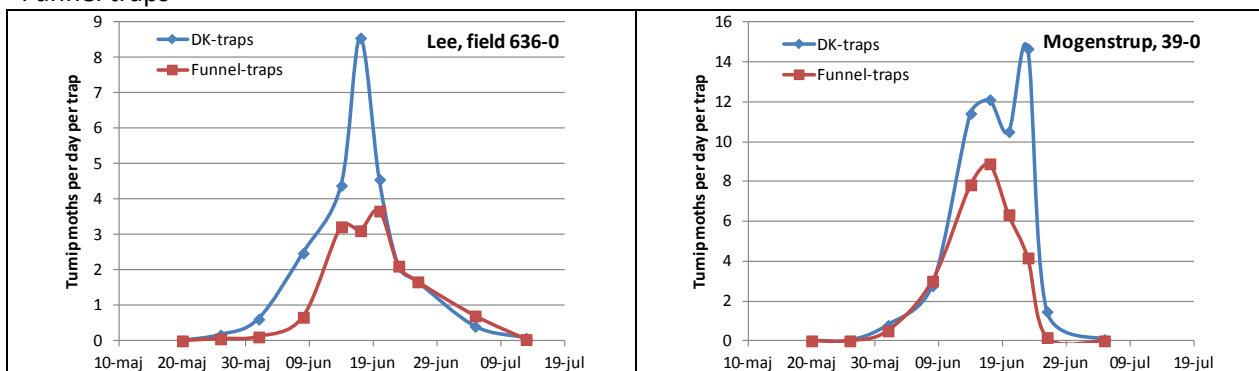


The TrapView traps were setup in two fields with carrots and compared with DK traps in the same system as with Funnel traps. One set of traps in a field at Sdr. Felding and on set of traps in a field at Svinninge. The traps have been reinforced so that they can stand the camera and the weather. For this season we have made special designed sticky boards with glue that fits the traps better and with glue so strong that it can hold the moths.



## Results:

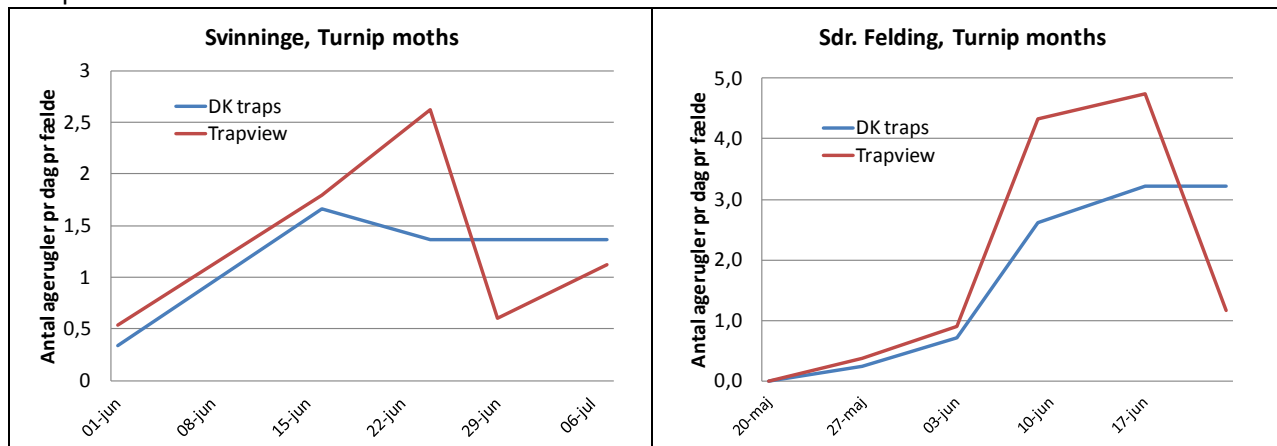
### Funnel traps



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## TrapView



## Conclusion:

- The Funnel traps are easy to set up and maintain.
- Often the months captured in the Funnel traps do not stick to the glue on the sticky paper that comes with the traps. The moths are lying dead at the bottom and when opening the traps on a day with strong wind, they can be difficult to count in the field.
- The DK traps caught more Turnip moths then the Funnel traps.
- Some days there are many bumble bees caught in the Funnel traps.
- The DK traps are difficult to maintain and handle with the strong sticky floorboard . Handling needs knitted disposable gloves.
- The TrapView traps did work better this year than in last year test.
- There was 15 % more Turnip moths in the TrapView traps than the DK traps.
- In the beginning of the Turnip month activity in spring time, it's easier to look at the TrapView-webpage, then driving out to the field to follow the catches.
- As soon as there are many months in the trap, the sticky floorboard needs to be changed just like in the DK traps and there will be no time saving by using the TrapView traps.
- The sticky floorboard is difficult to change in the TrapView traps. It did though work better with our own design of hard paper floorboards and strong glue.
- The TrapView trap needs reinforcement of the house. We did this with a metal frame around the traps.

## Discussion:

The Danish forecast model for Turnip moth do mainly focus on a threshold of 3 months per trap per day in combination with precipitation in the days when the larvae are in early stages. The day of the first arriving month in the trap in spring is not a critical part of the Danish forecast model.

In cases with other pests that come in lower number then Turnip moths, TrapView could advantageously be used as a tool for warning.

The test shows that Funnel traps can be used for monitoring the Turnip moth but in combination with the Danish forecast and warning model, we need to take into account that the Funnel traps do catch a lower number for moths and therefore the threshold needs to be adjusted.

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