

Angled yellow taps for carrot fly warning

Purpose:

To investigate whether 45 ° angulations of yellow traps for warning of attack by carrot flies gives better catches of carrot flies and a better warning.

Background:

Some years ago studies and experiments were carried out in UK to develop the method of carrot fly warning based on catches in the field with yellow sticky traps (*Rosemary H. Collier and S. Finch 1993. Carrot fly and cabbage root fly: improved systems for forecasting attacks.*). Based on studies and field tests a 45° angling of the yellow sticky traps has been recommended for carrot flies instead of placing the yellow traps vertically as is has been done traditionally. The recommendation of angling the traps is now practiced in some parts of other European countries like parts of Sweden and Holland. The manual that follows the purchased yellow sticky traps from Rebell in Switzerland, however, continues to recommend that the traps should be placed vertically in the carrot field. There is a need to clarify the advantages and disadvantages of an angled or vertical configuration in carrot fields under Danish conditions.

Description:

For testing the effect of angled yellow traps, special iron poles were constructed, with adjustable holders so the height of the plates over the canopy could be adjusted as well – see photo. For the traditional vertical traps, iron fence poles for fencing cattle, were used for the test. The test was conducted in six fields: four different carrot fields and two fields with root parsley and parsnips respectively. In each field traps were placed with a distance of 10 meters from the fence and 10 meters apart. There were 6 traps per field: three angled and three vertical traps. The angled and vertical traps were placed alternately between each other. The vertical traps were placed sideways towards the fence. The angled plates were placed so the bottom side of the angled plate pointed towards the fence.

Yellow traps were changed once a week when the first generation of flies were laying eggs in the period from first of May to the first week of July, and again when the second generations of carrot flies were laying eggs, during the period from mid July to the first week in September.

Results:

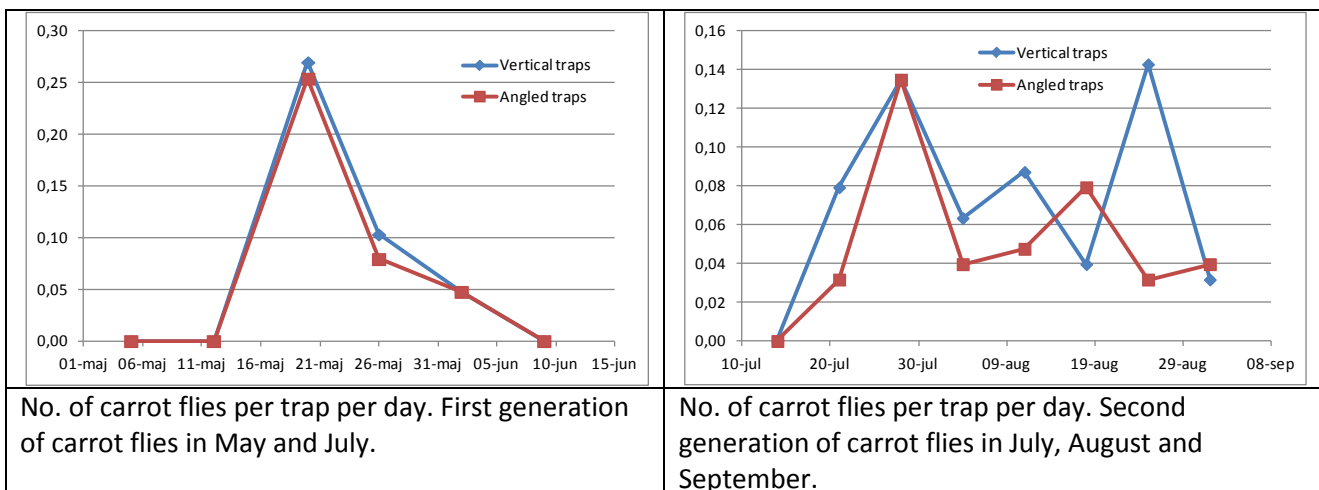
Sometimes on some locations the yellow sticky traps are full of non target insects. This can make it difficult to identify and count the carrot flies for at non trained person. In this test we have seen that the angled traps do have a lot of non target insects on the upper side, but hardly any non target insects on the underside. At the same time there is hardly any carrot flies on the upper side. Nearly all sit on the underside. This makes it much easier to identify and count the carrot flies on the angled plates then on the vertical plates. This corresponds very well with the experiences from UK, where tests showed 90% reduction of non target insects on the underside of the yellow sticky traps compared to vertical traps. Other reports has also shown that surrounding the yellow traps with at coarse meshed green net fence does have the same effect, with no effect on the number of carrot flies caught on the traps. The disadvantage of using the green meshed fence is that it makes changing the yellow traps more laborious. The green meshed fence is rarely used in Danmark in practice.

The average number for carrot flies caught on the yellow traps per trap per day is shown in figure 1 and 2 for the first and second generation respectively. This shows that on average, the angled and vertical traps caught almost the same number of carrot flies on the yellow traps, with a trend towards fewer flies on the angled traps rather than the vertical traps.

Out of all counts from each location and day with carrot flies on the traps, there were more carrot flies on the vertical traps in about 50 % of the counts. In 25 % of the count there were more carrot flies on the angled traps and on the 25 % remaining there was the same number of carrot flies on the angled and the vertical traps.

All in all, there was a clear trend to be caught fewer carrot flies on the angled sticky traps rather than the vertical traps – see Figure 2. Tests in Sweden showed the opposite trend with a bit more carrot flies on the angled traps in the beginning of the activity period (*Andersson S., Marmolin C. and Björkholm A. 2013. Morotsflugan*).

It has been proposed that the upper side of the angled plates should be covered by clear plastic or maybe the angled plates should be turned so they point away from the fence? This and other details need further investigation. Tests need as well to be repeated one more year before making any final recommendations.



Conclusions:

First years test in Danmark with vertical and 45° angled yellow sticky traps for carrot flies shows that the vertical and angled sticky traps catch equal number of carrot flies or maybe a trend toward more carrot flies on the vertical traps. The sticky traps are more selective to carrot flies when angled and carrot flies easier to count for at non trained person.



Angled and vertical yellow sticky traps for warning of carrot fly attack in a field in May when first generation for carrot flies are active.

In the beginning of the season with carrot still do not cover the ground, the yellow plates tends to be cover by fine particles of soil from wind erosion or rain splash. That's way the plates are no pushed all the way dow to the ground surface in the beginning.



Angled and vertical yellow sticky traps for warning of carrot flies in August in carrot for strawing.



Carrot fly on trap in August.



Upper side of the angled yellow traps, covered with many non target insects.



Underside of the same yellow sticky traps as shown above. There is significantly fewer non target flies on the underside than the upper side on the angled traps, making it easier to identify and count the carrot flies.

Lars Møller, with help from Tomasz Matejka, 2014