

An investigation of the occurrence of the black currant gall mite (*Cecidophyopsis ribis* (Westw.)) in a planting of black currants (*Ribes nigrum*)

Undersøgelse af forekomsten af solbærknopgalmiden (Cecidophyopsis ribis (Westw.)) i en solbærbeplantning (Ribes nigrum)

Steen Lykke Nielsen

Summary

The occurrence of the black currant gall mite (*Cecidophyopsis ribis* (Westw.)) was registered in an orchard planting of one-year-old approved black currants (*Ribes nigrum*), variety 'Black Reward'. At the time of investigation, the black currants had been exposed to infestation for one season from a neighbouring planting of black currants heavily infested with gall mites.

The observations showed, that the number of bushes infested with gall mites increased with distance until 60 m from the source of infestation. With further distance, the number of infested black currants was reduced. The explanation given is, that the rise in the number of bushes infested with gall mites is caused by local shelter conditions and that the observed fall is caused by the increasing distance from the source of infestation.

Key words: Black currant gall mite, *Cecidophyopsis ribis* (Westw.), black currant, *Ribes nigrum*, occurrence, gradients.

Resumé

I en erhvervsplantage blev forekomsten af solbærknopgalmiden (*Cecidophyopsis ribis* (Westw.)) registreret i en beplantning af etårige solbær (*Ribes nigrum*), sort 'Black Reward'. På undersøgelsestidspunktet havde buskene været udsat for smitte i een sæson fra en tætliggende solbærbeplantning, der var stærkt inficeret med solbærknopgalmider.

Optællingerne viste, at antallet af buske inficeret med galmider steg med stigende afstand indtil 60 m fra smitekilden. Med yderligere afstand faldt antallet af angrebne buske. Som forklaring anføres, at stigningen i antal buske med knopgaller skyldes lokale læforhold, mens faldet skyldes den øgede afstand til smitekilden.

Nøgleord: Solbærknopgalmiden, *Cecidophyopsis ribis* (Westw.), solbær, *Ribes nigrum*, forekomst, gradienter.

Methods

The source of infestation was a 2.6 ha planting of 9-year-old black currants (*Ribes nigrum*), variety 'Rootknop', the rows were north-south oriented. 55% of the buds were infested with black currant gall mites (*Cecidophyopsis ribis* (Westw.)). A 1.6 ha field, due north of the 'Rootknop' planting and only separated from it by a 5 m wide carriage road, was planted at the end of 1982 with approved black currants, var. 'Black Reward' from the Netherlands. The planting distances were 0.8×3.0 m and the rows ran north-south.

The black currant plantings were situated on a slope, starting in the north of the 'Black Reward' planting and continuing with a gradient of 1 m per 100 m up through the 'Rootknop' planting and further 100 m south where the ground falls rather steeply. To the north the ground rises moderately.

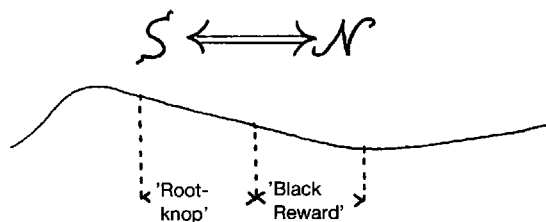


Fig. 1. Sectional view strongly compressed, south-north of the investigated area.

Stærkt sammentrængt snit fra syd til nord af det undersøgte område.

This means that the 'Black Reward' planting was situated in a hollow. Neither to the north nor to the south of the black currant planting were there any shelter belts. On the other hand, the plantings were protected against west winds by several shelter belts of different heights.

The infestation of gall mites in the 'Black Rewards' was registered at the end of 1983, after the planting had been exposed to the source of infestation for one growing season. The exact position of every bush and the occurrence or the absence of galls was registered. The registration com-

prised 22 rows out of 39 possible. Because of the shape of the field, the rows did not all have the same length. The shortest of the registered rows was 78 m long, with 98 bushes, and the longest 176 m, with 220 bushes.

Results

3647 bushes were registered and 867 bushes were found with one or more galls, which gives a degree of infestation of 24%.

The placing of the infested bushes in proportion to the source of infestation is shown in Fig. 2.

Starting south in the rows nearest to the source of infestation are indications for every 25 bushes, of how many were infested with gall mites. The number of infested bushes increased with the distance until 60 m from the source of infestation. With greater distance the number of infested black currant bushes was reduced. Because of the 2 opposite trends 2 regression lines are computed: $y = 0.06x + 5.67$ from 0–60 m and $y = -0.07x + 12.15$ from 61–140 m. The 2 coefficients of regression differ significantly from each other.

There were no gradients of infestation with gall mites in the east-west direction, transverse to the direction of the rows.

Discussion

Gradients were only observed for the occurrence of the gall mites in the north-south direction, so the gradients can be related to the distance from the source of infestation.

The observed pattern of gall mite infestation first with an increasing gradient and then with a declining gradient in proportion to the distance to the source of infestation seems surprising. *Thresh* (2), however, found a similar pattern in the spread of black currant gall mites in an investigation of the influence of wind on the spread of mites from a source of infestation to healthy bushes. In all directions, it was found that the gradient of the number of galls per bush declined with the increasing distance to the source of infestation, except in the wind direction from the source of infestation. Here the rate of infestation increased for the first 3 m from the source of in-

Number of bushes with galls per 25 bushes
 Antal buske med galler pr. 25 buske

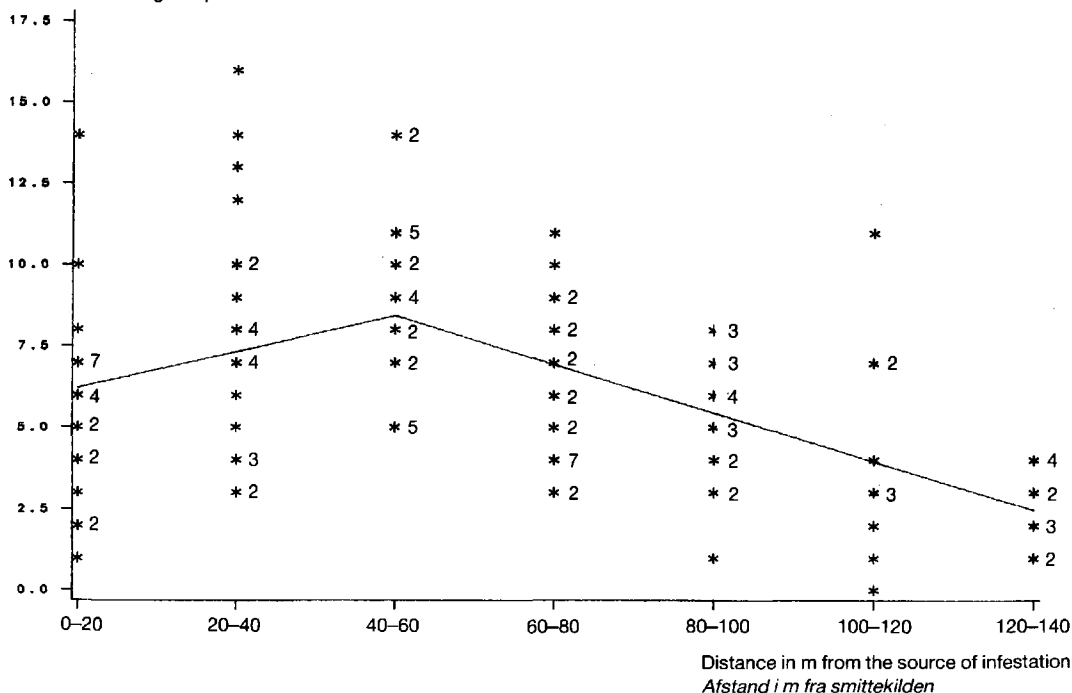


Fig. 2. Number of bushes with galls per 25 bushes as a function of the distance to the source of infestation. An asterisk indicates one row of bushes. The numbers at some of the asterisks indicate 2 or more merging asterisks. In the diagram 2 regression lines are shown.

Antal buske med knopgaller pr. 25 buske som en funktion af afstanden til smitekilden. En stjerne angiver en række. Hvor flere stjerner er sammenfaldende, er antallet angivet ved stjernen. Der er indlagt 2 regressionslinier i diagrammet.

festation and only with further distance the declining gradient was observed.

In Denmark the migration of the black currant gall mites from the old galls to the new axial buds occurs in May and June. In these 2 months in 1983 the prevailing wind in the investigation area was south. 17 days with a south wind and 9 days with a north wind were recorded (Jordbrugsmeteorologisk Tjeneste, pers. com.)

The observed spreading pattern of the gall mites was found in the prevailing wind direction from the source of infestation.

A possible explanation of the results is that the increasing infestation of the gall mites from 0-60

m from the source of infestation is due to increasing shelter in the hollow, where the 'Black Reward' planting was growing. The shelter conditions effect the possibility of the black currant gall mites to migrate to a new black currant bush, whether the gall mites are spread by the wind itself or by flying insects (1). The decreasing infestation of the gall mites from a distance of 60 m and further away from the source of infestation, on the other hand, may be due the increased distance to the source of infestation.

Conclusion

The gradients of infestation with gall mites found

in this investigation run for much longer distances than *Thresh* (2) found in his investigation, but the pattern is the same: The incidents of infestation with black currant gall mites decreases as the distance to the source of infestation increases, but the local wind and shelter conditions influence the spreading pattern.

Literature

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