

A PHYSIOLOGICAL DISORDER IN CUCUMBER UNDER LOW DAY TEMPERATURE

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Abstract

A description of a physiological disorder in greenhouse cucumber is given. Malformation of leaves, fruits and stem appear at day temperatures of 17°C in wintertime.

Introduction

Malformation of greenhouse cucumber fruits, leaves and stem in winter under low temperatures is known in the Netherlands as 'cold damage'.

The occurrence of this physiological disorder in a day- and night-temperature experiment gave the opportunity of its description in more detail.

The necessity of optimize greenhouse temperature, due to increasing energy price, will increase the appearance of this disorder.

Materials and methods

Cucumber plants - 5 leaves, cv 'Corona' - were planted 15 December 1978 in the climate glasshouse at Naaldwijk (Van de Vooren et al. 1975). The plants were grown at daytemperature 17, 20, 23 or 26°C, nighttemperature 16°C, or nighttemperature 12, 16, 20 or 24°C, daytemperature 23°C till 1 March 1979 (for more details Van de Vooren, 1980).

Results

All plants developed normal leaves, fruits, stem and sideshoots, except those at the treatment of 16°C (night), 17°C (day). Several weeks after the start of the experiment this treatment (16/17°C) showed symptoms of 'cold damage'. No production was obtained till the end of April. Development was normal after half of April = 6 weeks after the end of the temperature treatment.

Description of symptoms

The leaves of the plants are crinkled and crisp, several leaves and many small fruits are placed at the same node on the stem (figure 1).

Internode length varies strongly from nearly zero to about 50 cm. Flowers, fruits and stems show a high amount of fasciation. Small leaves and fruits develop on the fruit (figure 2).

Side shoots show the same symptoms as the main stem. Disturbed side shoots did develop until the end of May.

Discussion

The described physiological disorder is known from reports of the extension service in the Netherlands. The symptoms occur some time after a period of low glasshouse temperature in winter or after clear, cold weather. The last denotes at the possible importance of the growing point temperature.

Remarkable is that only the low daytemperature (17°C) in the experiment gave this disorder. No symptoms were found under low nighttemperature (12°C). In day- and nighttemperature experiments at the end of February, March no symptoms were found. This denotes that beside temperature also daylength or radiation can be important in causing the disorder.

The range for optimization of the greenhouse temperature is limited by physiological disorders as the described (Van de Vooren et al. 1980). So for this purpose more knowledge of the influence of daylength, radiation and temperature is needed.

References

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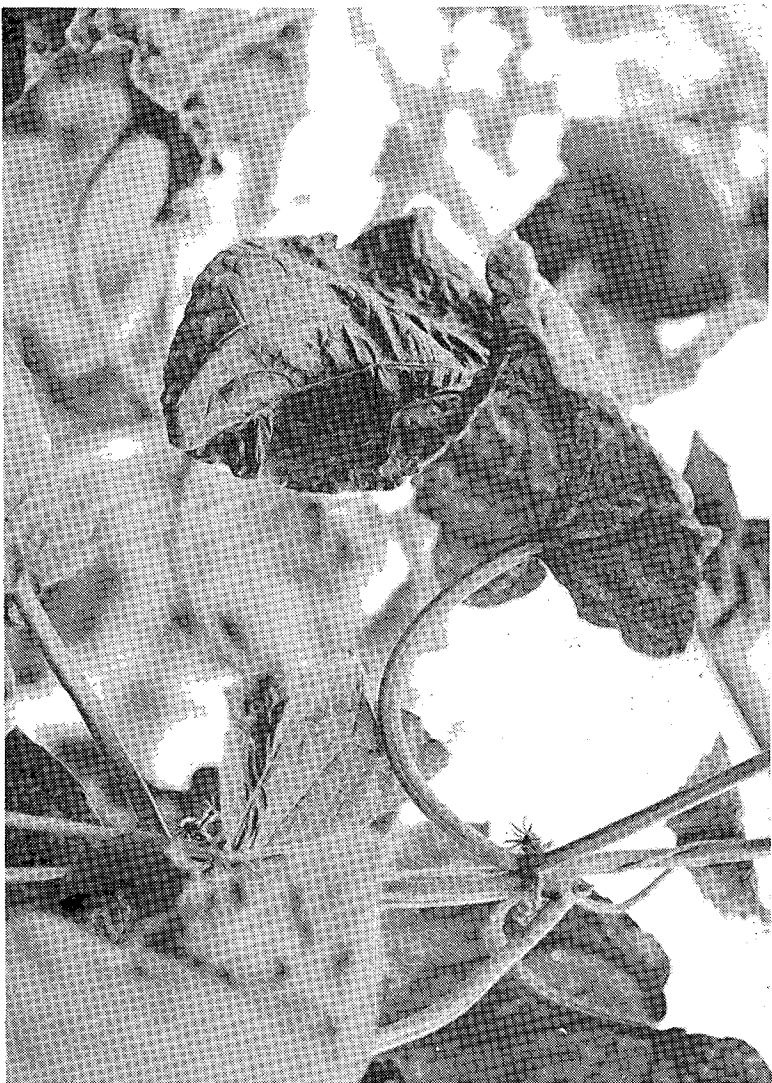


Figure 1 - "Cold damage" of a cucumberplant.
Temperature regime 16 (night) , 17 (day) °C

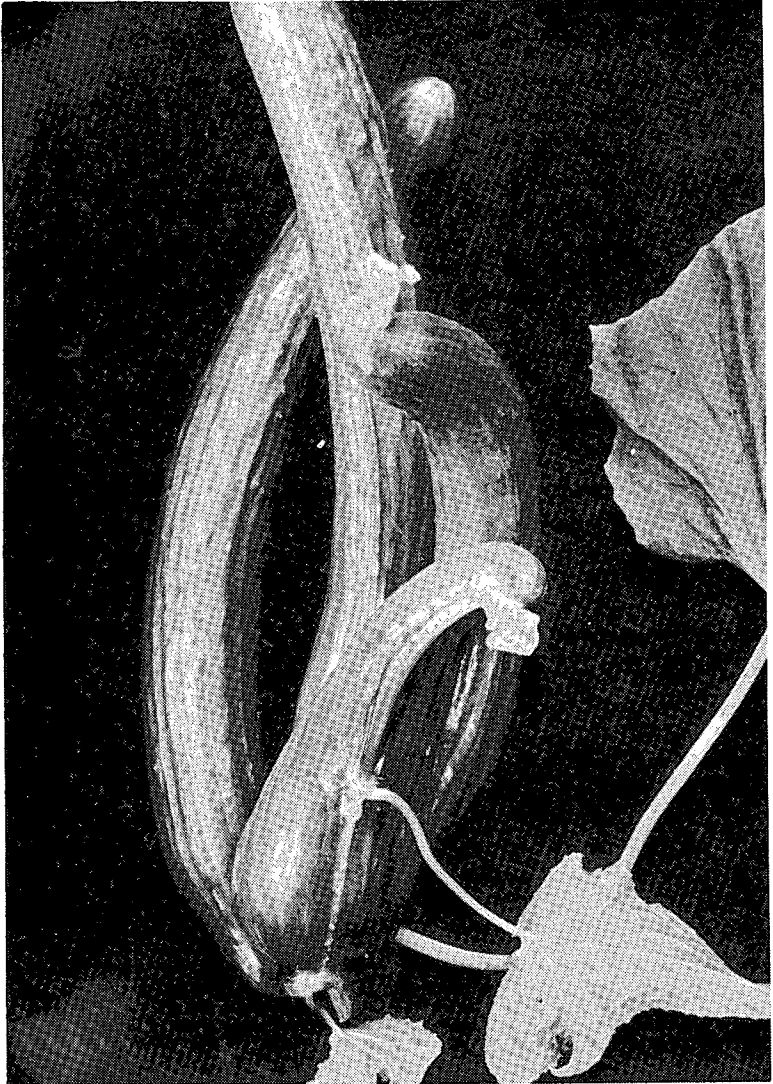


Figure 2 - "Cold damage" of a cucumbe(r)fruit damage