The effect of anti-hail nets on the chlorophyll content index (CCI) and the total amount of nitrogen in leaf and sugar in the must cv. Grasevina (Riesling italico)

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Introduction

- Croatia - diverse and favourable conditions for vine-growing
- two clearly distinct climatic regions:

– the “continental” region with features of a continental-type climate (middle European)

- the “coastal” region with a pronounced influence of the Adriatic Sea - Mediterranean-type climate (Maletić et al., 2003).

Introduction

- Graševina (Riesling italico):
- the most important white cultivar in Croatia,
- it covers 30% of all vineyards
- considerably present only in Hungary, Slovenia, Slovakia, Austria, Serbia and Romania (Preiner et al., 2011).

Introduction

- The increase in hailstorms, probably due to global climate change, resulted in the installation of either black or white hailnets in European fruit orchards (Solomakhin and Blanke, 2007).
- The grapevine - particularly sensitive on hail because the consequences on the condition, amount and quality of yield manifest in several years.

Introduction

- Shading with hail protection nets has become an important issue for many fruit growing areas, since it proved to be a good protection against hail storms which can damage fruits and assimilation areas (Stampar et al., 2002)

Introduction

According to Widmer, (2001):

-black nets reduced light levels by 18 to 25 %,

-white netting by 8 to 12 %

-grey nets by 15 to 17 %

Cartechini and Palliotti, (1995):

- vine yield and berry quality decreased linearly with increasing shade intensity.

Aim

- determine the effect of different color of anti-hail net on grapevine:
  - CCI
  - amount of nitrogen in leaf
  - sugar in the must cv. Grasevina

Materials and methods

- Klanjec wine-growing region (northwestern Croatia)
- the variety Graševina (Riesling italico) grafted on Kobber 5BB

Materials and methods

- randomize complete block design
- 3 treatments :
- control (No net)
- black net
- white net

Materials and methods

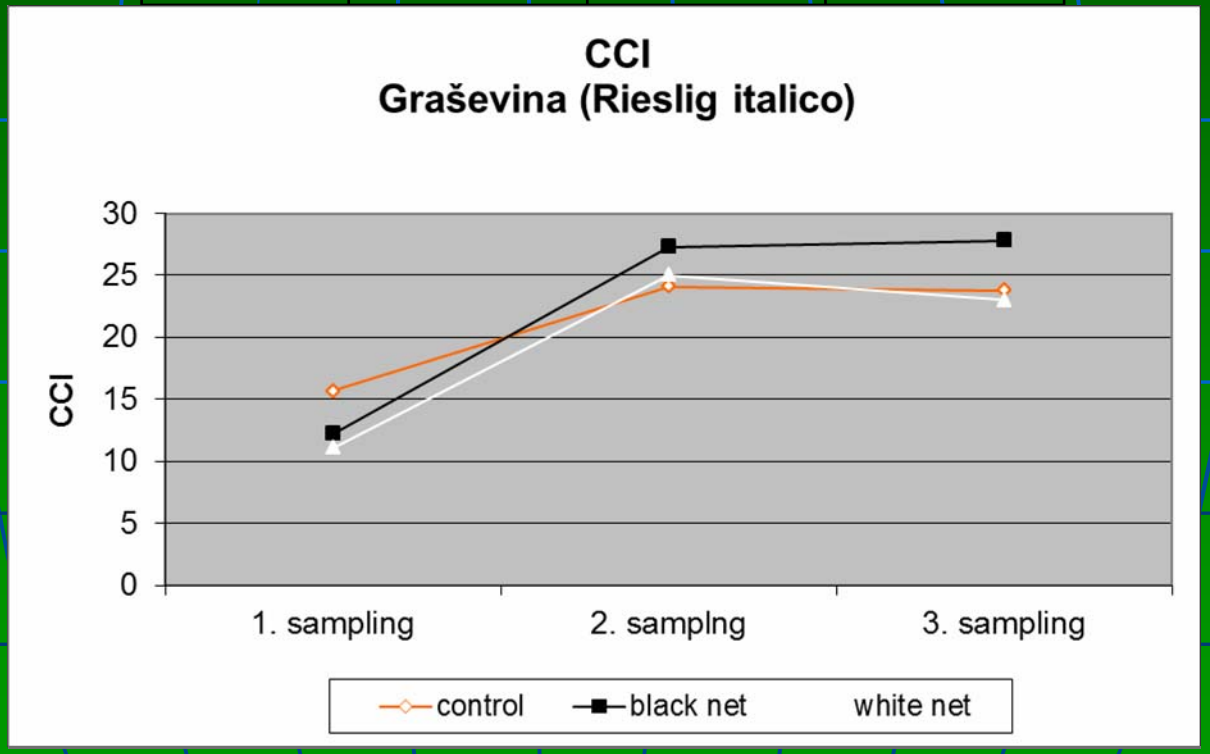
- Samples of vine leaves:
- at the flowering
- at the veraison stage
- at the end of the growing period (harvest)

Materials and methods

- The chlorophyll content index (CCI) - Chlorophyll content meter (CCM-200 by Opti-Sciences, Inc., Hudson, USA).
- Total nitrogen in grapevine leaves - Kjeldahl method (AOAC, 1995).
- Must sugar content - digital Refractrometer PR-101, Atago

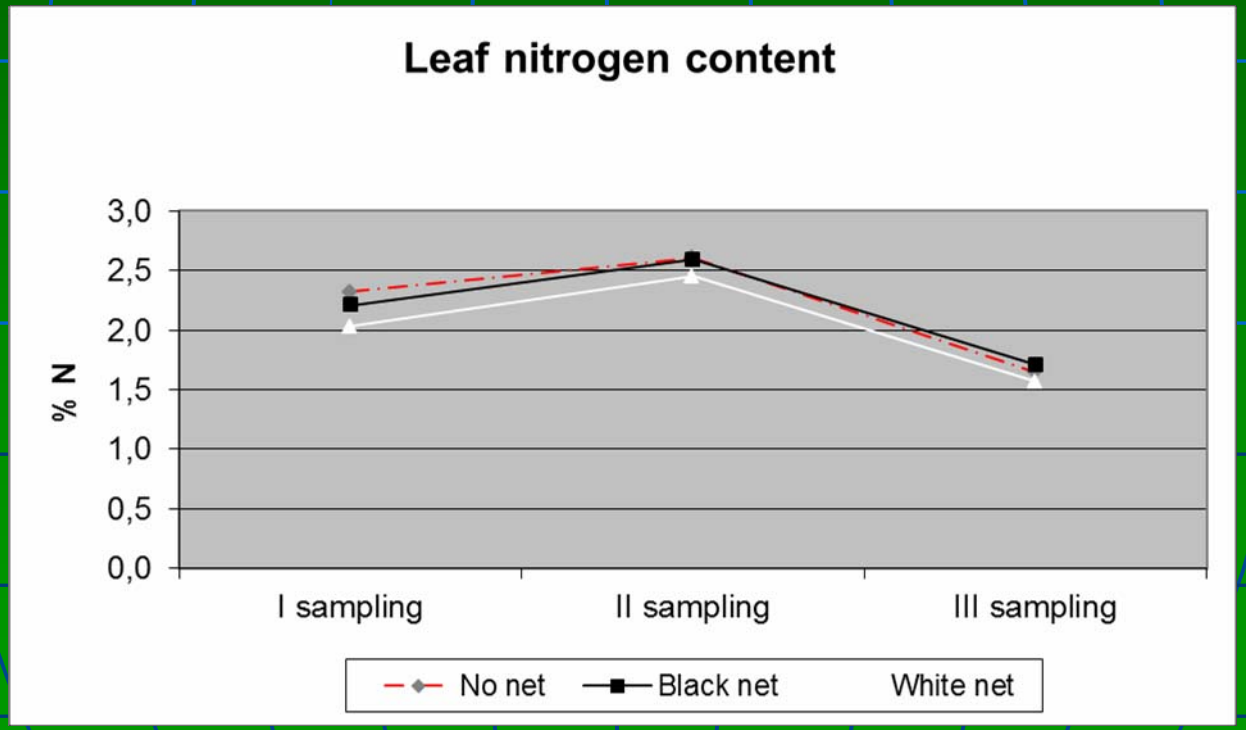
Results-chlorophyll content index

	CCI		
treatments	1. sampling	2. sampling	3. sampling
control	15,7 a	24,1	23,8
black net	12,2 ab	27,3	27,8
white net	11,1 b	25,0	23,0



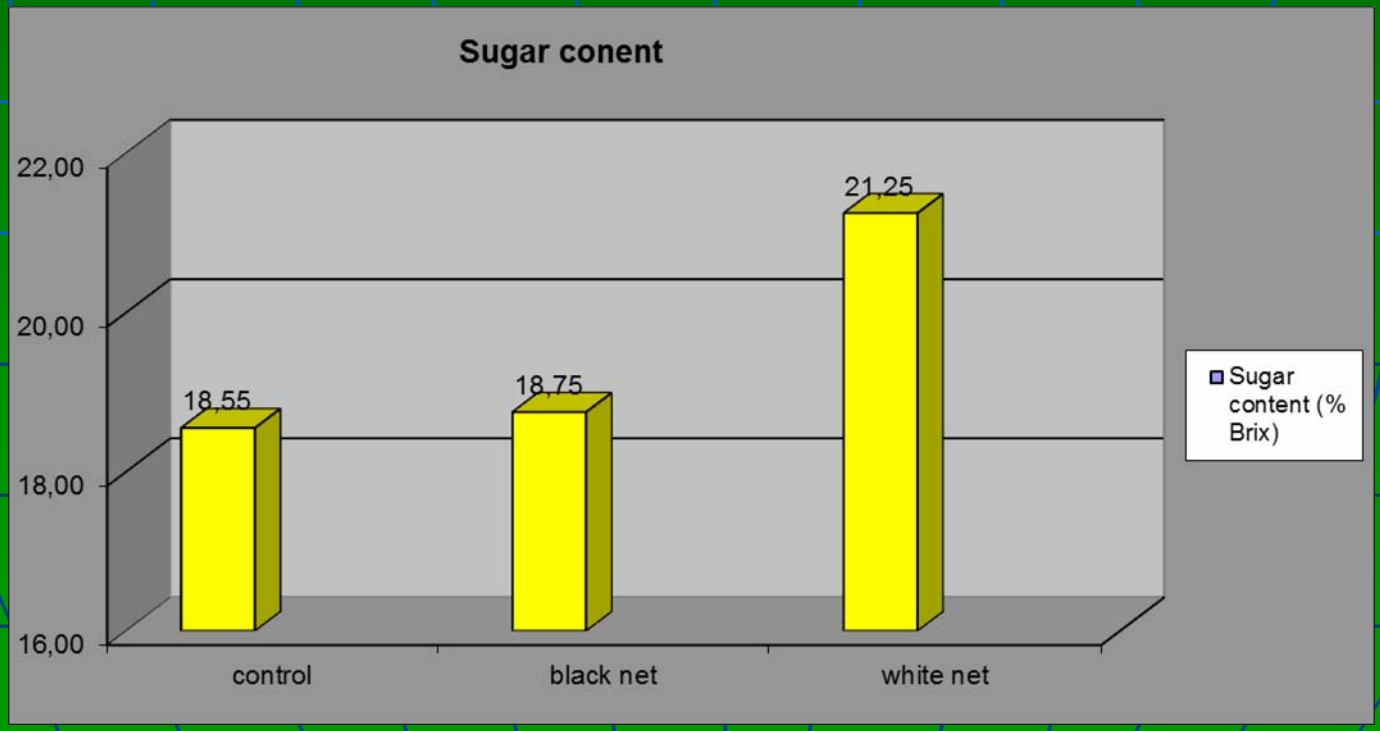
Results-Total nitrogen

	% N		
treatments	I sampling	II sampling	III sampling
Control	2,32 a	2,61	1,65 b
Black net	2,21 ab	2,59	1,71 a
White net	2,03 b	2,45	1,57 c



Results- Sugar content

Treatments	Sugar, % Brix
No net	18,55 b
Black net	18,75 b
White net	21,25 a



Conclusions

- Clorophyll content index in the first and third sampling was directly corelated with amount of nitrogen.
- The highest amount of nitrogen leaf content and the highest CCI under the black net in harvest indicates later ripening of Graševina wine variety.
- The highest amount of sugar as a basic parameter of quality under the white net is probably the result of better microclimatic conditions (higher temperature and lower shading).
- Therefore, according to this research in areas with critical number of sunshine hours for the cultivation of grapevines we can recommend to use white nets.


Thank you for you attention!