



**LITHUANIAN RESEARCH CENTRE FOR AGRICULTURE AND
FORESTRY INSTITUTE OF HORTICULTURE**

The effect of sustainable plant protection and apple management for fruit quality

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- **Growers participating in the “Agri-environment payments” program shall follow requirements of Regulation 1782/32003.**
 - **According these requirements the same active ingredients of plant protection products must be used not more than two times per vegetation season**
 - **and preharvest interval should be 1.5 times longer than indicated on the label.**
 - **Plant protection products labelled as "Very toxic" and (or) "Toxic" are forbidden.**
 - **At the same time, forecasting models should be incorporated in plant protection system.**
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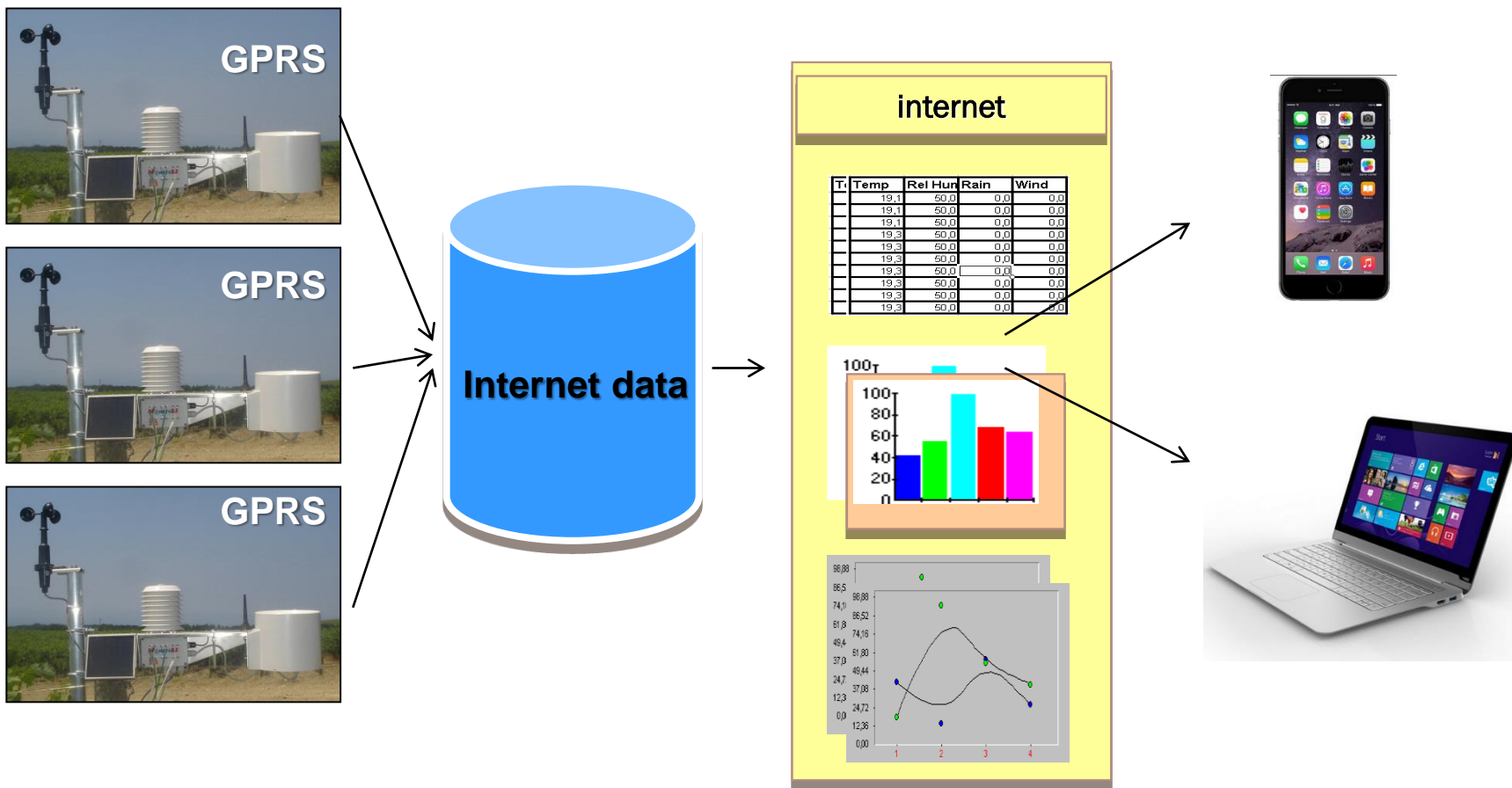
- The aim was to estimate the effect of reduced plant protection system and integrated apple-growing technology on apple fruit quality



The research was carried out at the LRCAF Institute of Horticulture in 2011–2013 in intensive apple orchard.

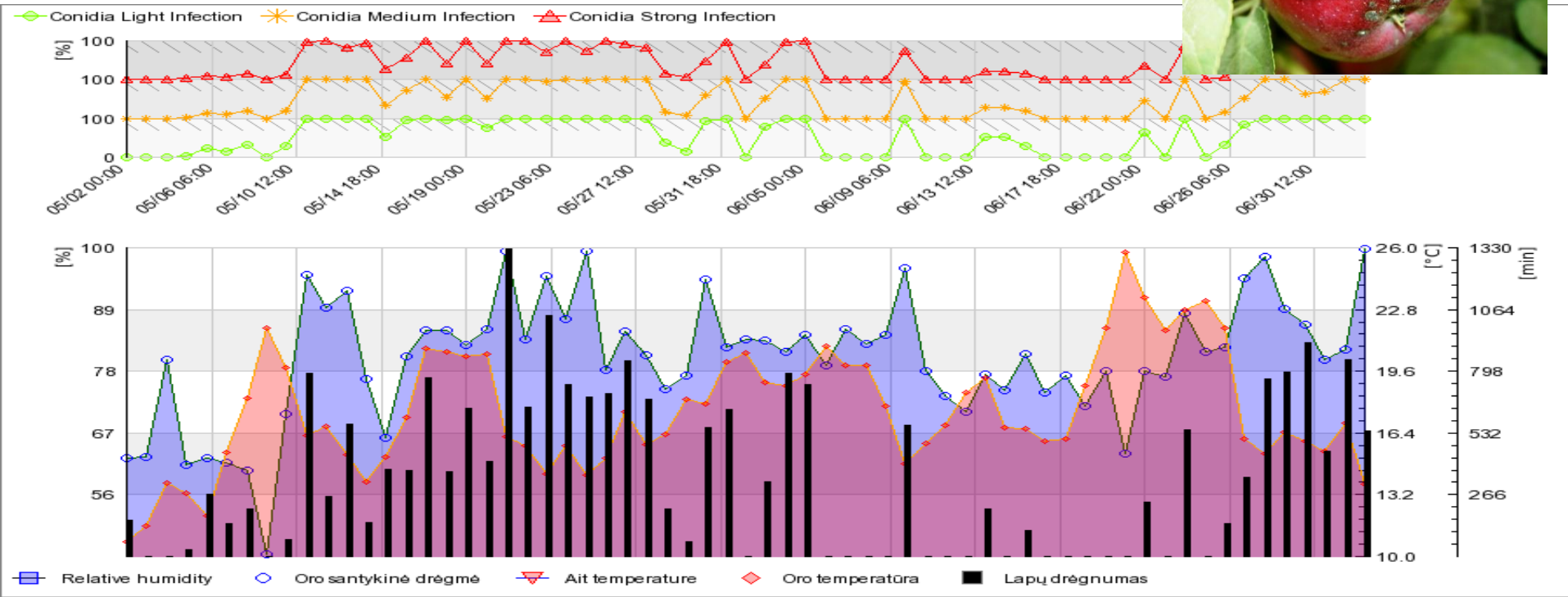
Cultivar / rootstock	Age, years	Planting scheme, m	Apple trees / ha
(LT)‘Auksis’ B.396	9-12	4 x 1,25	2000
(PL)‘Alva’ P 60	9-12	4 x 1,25	2000
(USA)‘Connell Red’ P 60	9-12	4 x 1,25	2000
(PL)‘Ligol’ P 60	6-9	4 x 1,25	2000
(PL)‘Lodel’ M.26	12-15	4 x 2,00	1250
(CZ)‘Rubin’ P 60	6-9	4 x 1,25	2000
(CZ)‘Shampion’ P 60	6-9	4 x 1,25	2000

Diseases control program was based on internet supported forecasting system iMETOS®sm (Pessl Instruments, Austria)



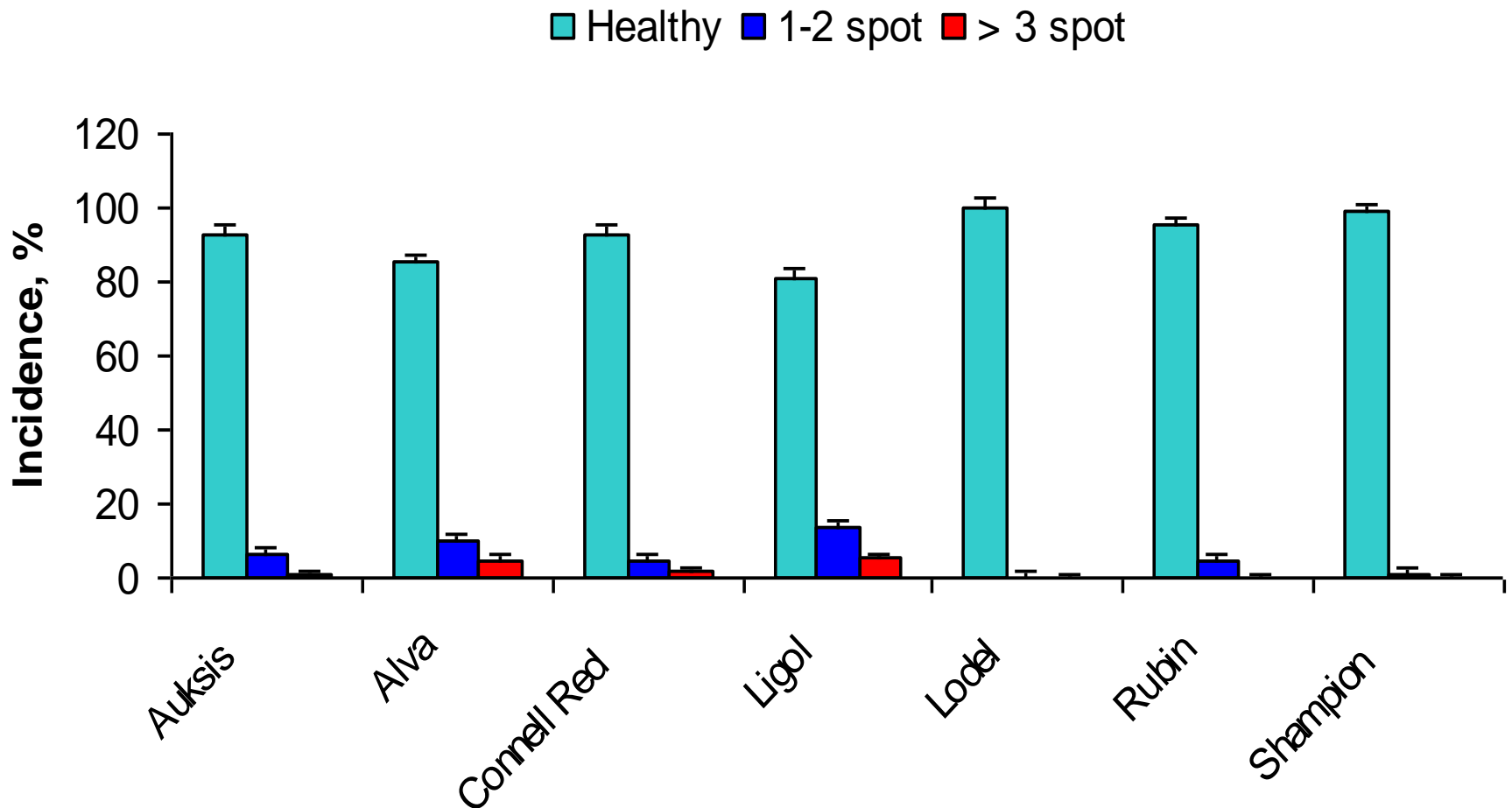
http://metos.at/pikernel_dev/index_new.php

This system recorded meteorological conditions and calculated apple scab infections at three levels: light, medium and high.



Susceptible to apple scab cultivars were sprayed when the risk of ascospores release or conidia light infection reached more than 70-80 %. During the trial scab susceptible cvs. 'Alva' and 'Ligol' on average were sprayed twelve times but remaining cultivars on average were sprayed nine times.

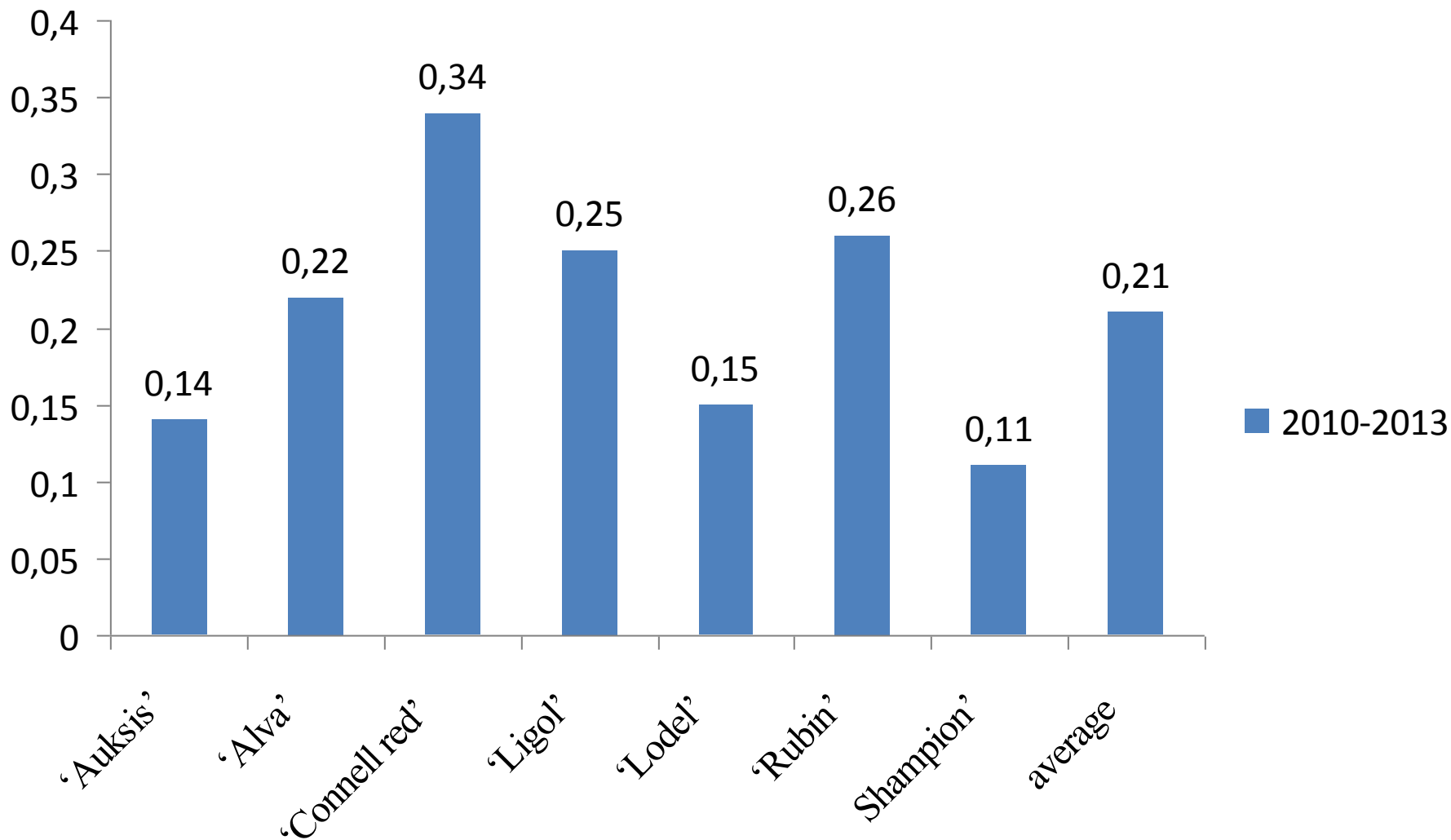
Reduced pesticide program does not guarantee total scab control; therefore damaged fruits should be thinned manually. Apple scab assess on fruits (n=100) during harvesting on a 0-2 scale: 0= no scab symptom; 1= 1-2 spots per fruit; 2= more than 3 spots per fruit.



High yield and excellent fruit quality are guaranteed by: suitable combination of variety and rootstock, optimal planting scheme, integrated plant protection, rational nutrition, reasonable pruning in winter and summer and annual crop load management.

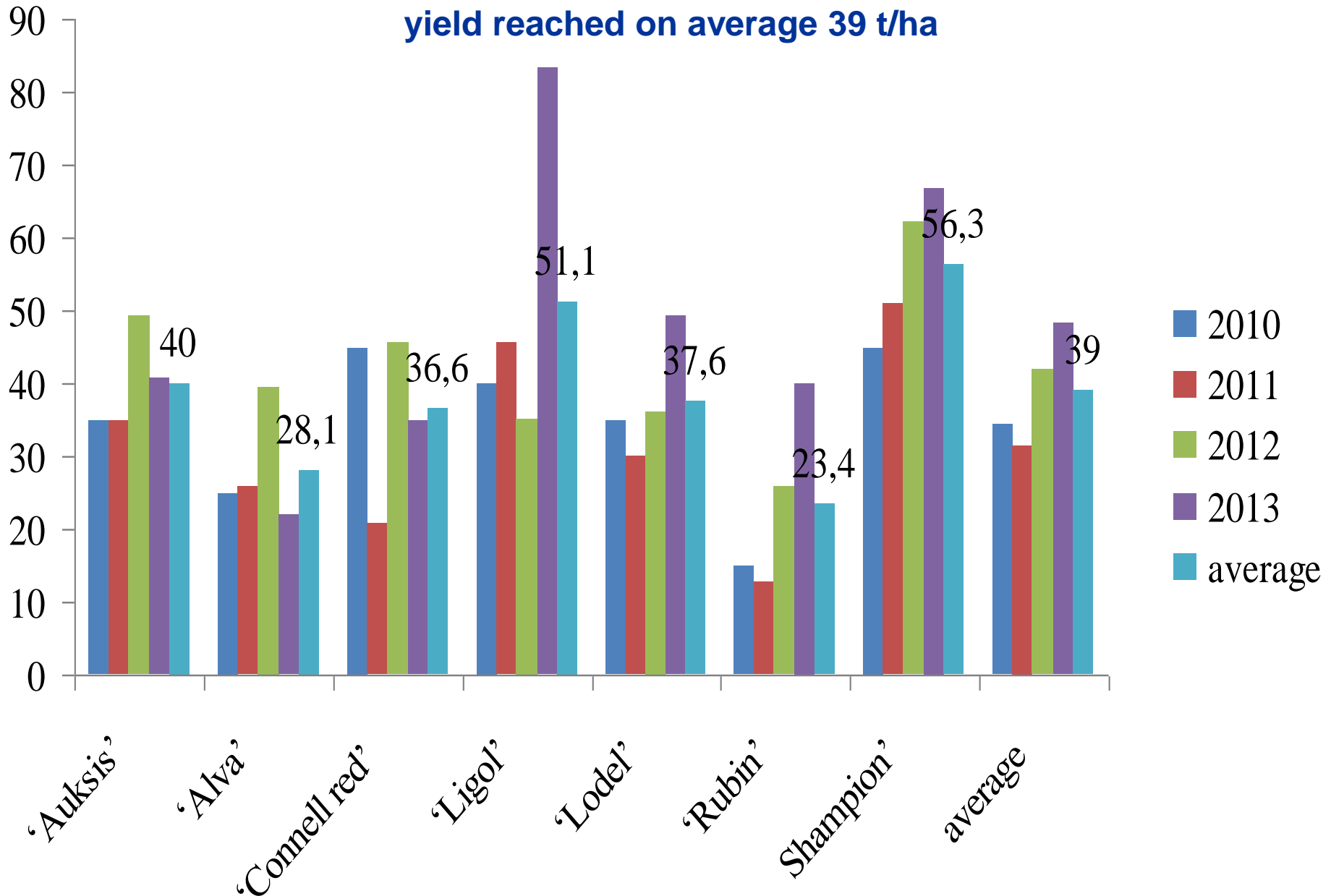


This complex of measures influence, that all cultivars had a relatively small index of biennial yielding

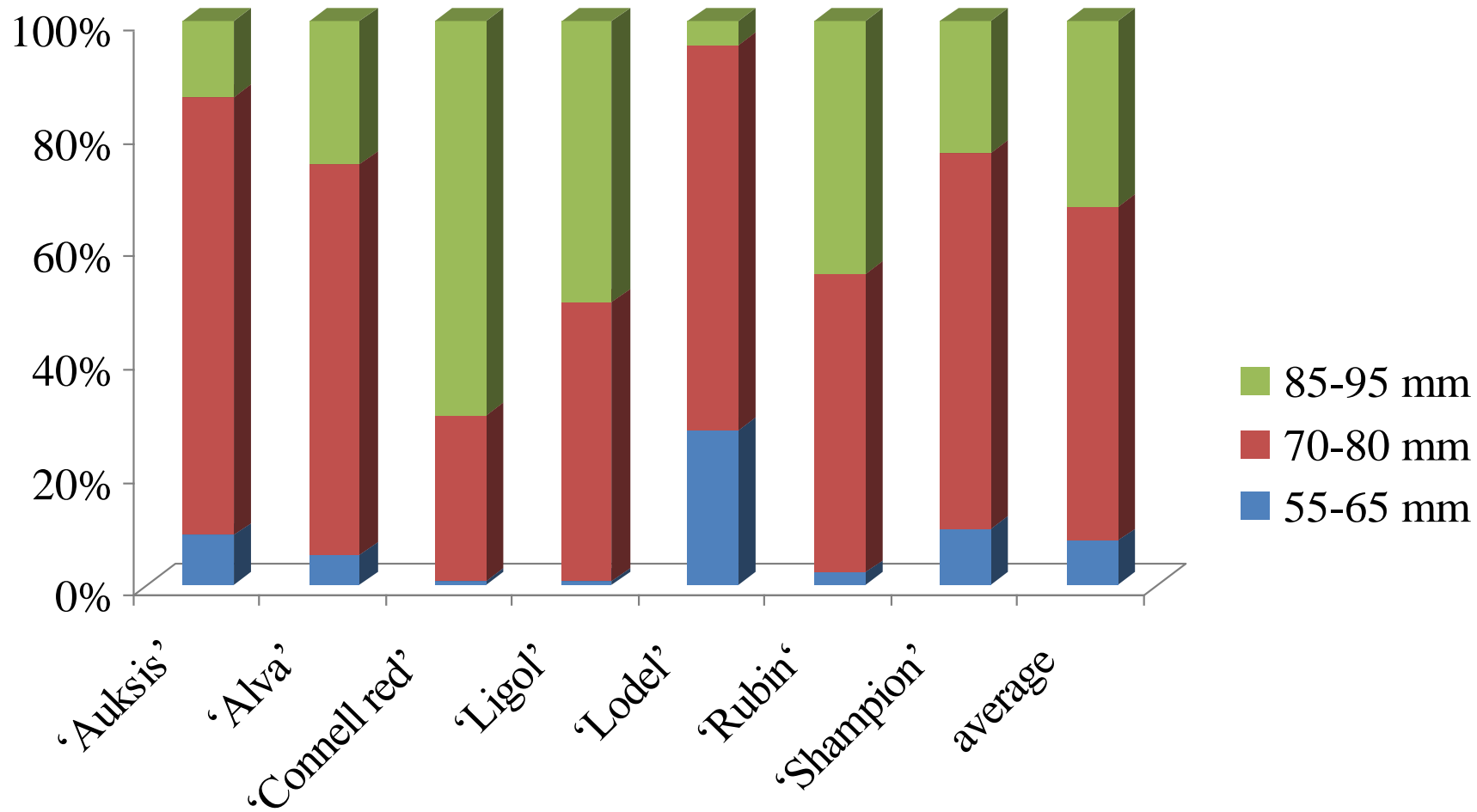


Applying environmentally friendly fruit cultivation system high quality fruit

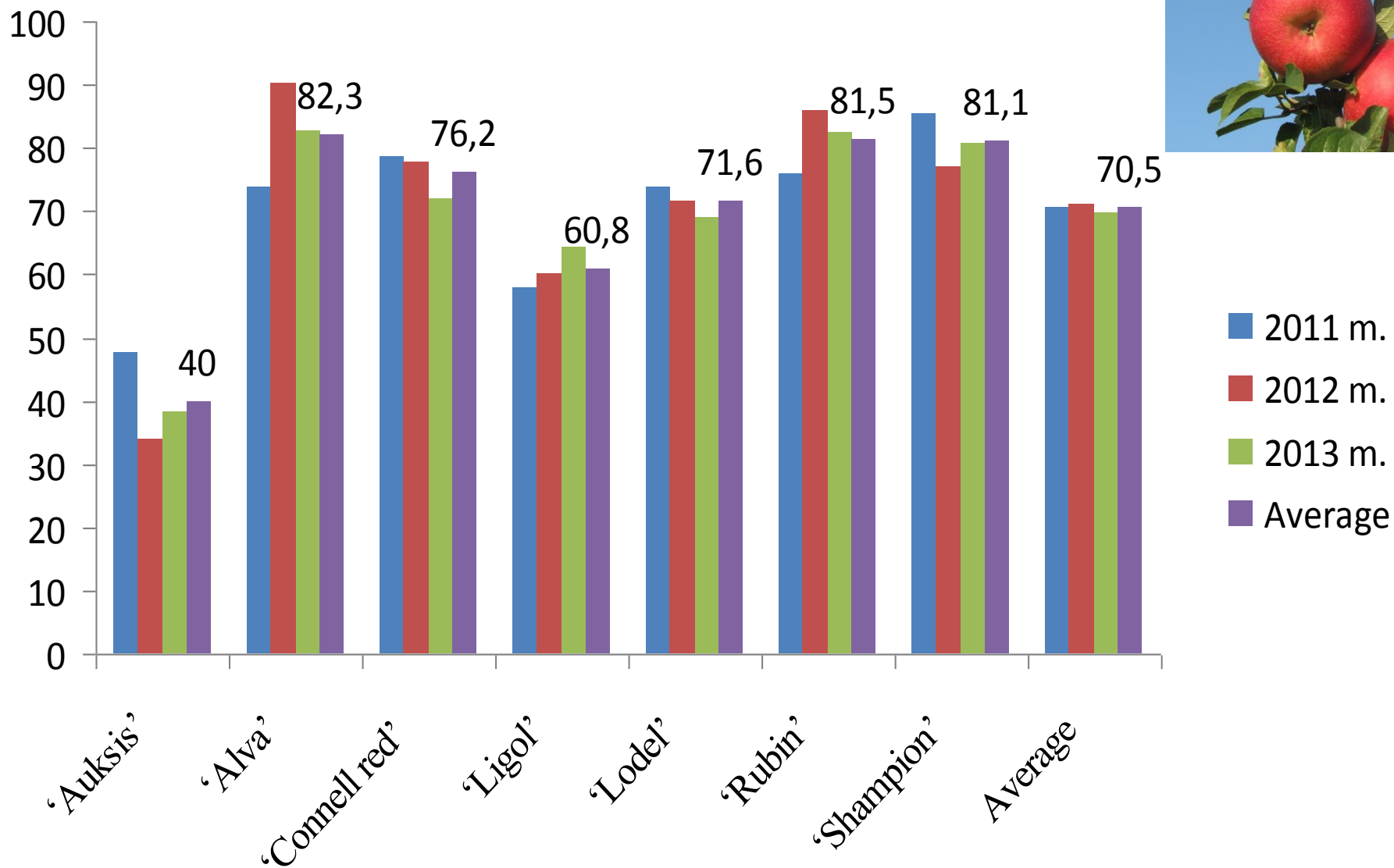
yield reached on average 39 t/ha



Applying environmentally friendly fruit cultivation system influence external fruit quality. Fruit diameter, mm



Fruit colour, %



Sustainable plant protection and apple management for fruit quality

- Thank you for your attention

