



**The Third Interim Meeting of the Regional Expert Advisory Working Group -
REAWG
on Market Standards for Fresh Fruits and Vegetables**

Guide to harvesting and maintaining the quality of apple and table grape quality

*Prof. dr. sc. Tomislav Jemrić
University of Zagreb Faculty of Agriculture, Croatia*

**27th – 29th March 2024
Duress, Albania**





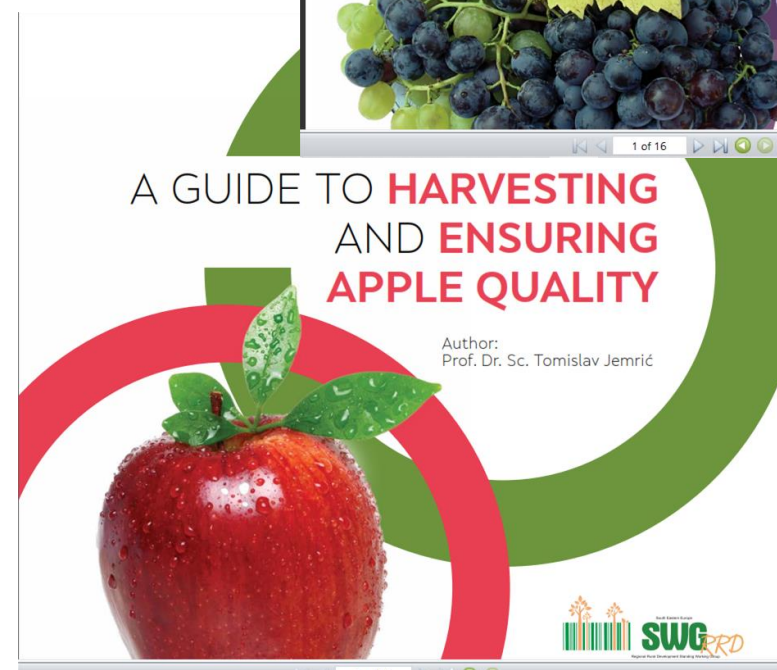
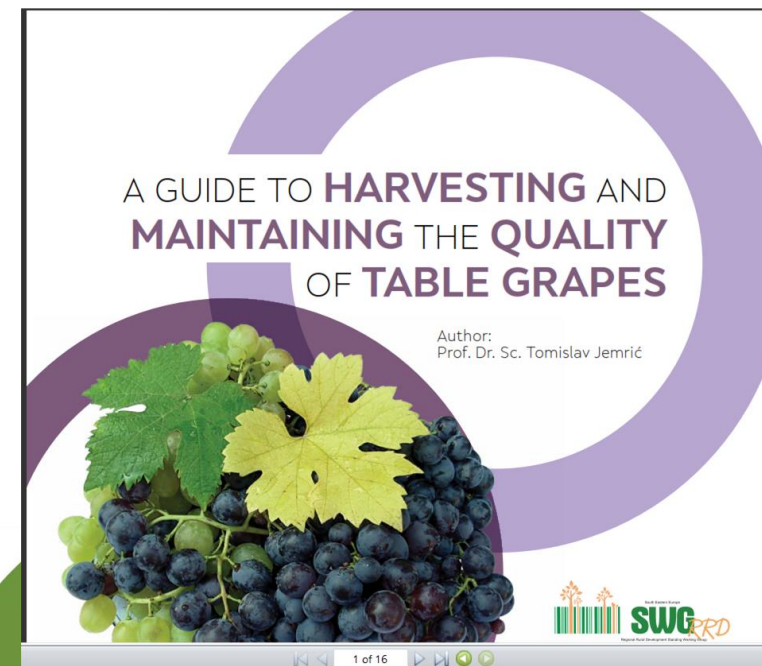
SWG RRD initiative:

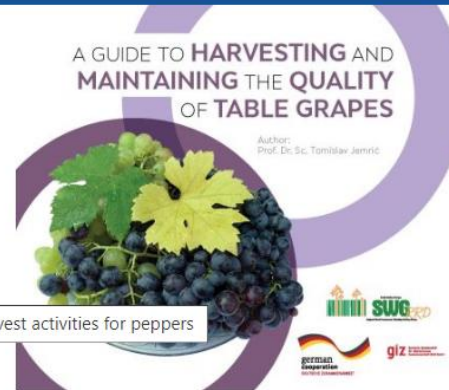
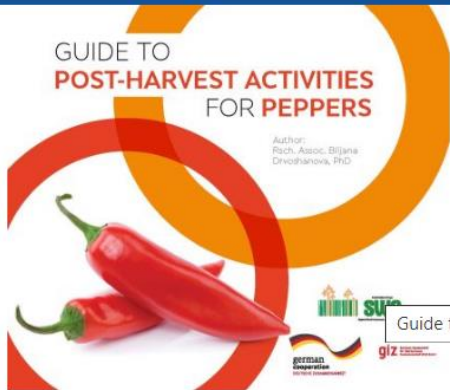
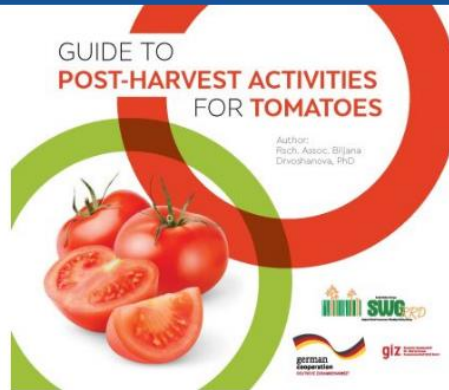
- Create short, simple and understandable manuals on the quality of fruit and vegetables in order to reduce post-harvest losses, increase the competitiveness of fruit and vegetable producers and achieve better quality of fruit and vegetables on the market
- Publish manuals in Croatian/Serbian, Macedonian, Albanian and English so that they are available to as wide a range of readers as possible



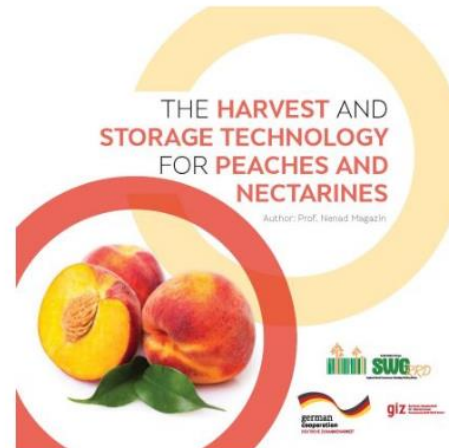
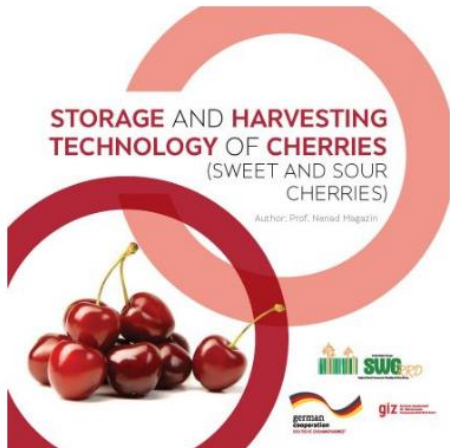
The manuals are intended for:

- fruit and vegetable producers
- fruit and vegetable traders
- consumers





Guide to post harvest activities for peppers





The aim:

- To introduce producers, traders and consumers with the basic maturity indices and quality indicators of apples and table grapes
- Help in identifying the most common defects and disorders of apples and table grapes
- Reduce postharvest losses of apples and table grapes



A GUIDE TO **HARVESTING** AND **ENSURING APPLE QUALITY**

Multiple methods should be employed to evaluate the maturity of the apple fruit.

If, when shaking the harvested fruits, a noise is audible from a distance exceeding 1–2 m, substantial post-harvest losses might occur.

When the fruits are at an advanced stage of maturation, it is advisable to conduct the harvesting process with greater caution and at a slower pace.



Author: Prof. Dr. Sc. Tomislav Jemrić

A GUIDE TO **HARVESTING** AND **MAINTAINING THE QUALITY** OF **TABLE GRAPES**

Table grapes can only be harvested by hand with gloves.

The ideal timing for harvesting is early morning or late evening.

Table grapes should be cooled as quickly as possible after harvest.



Author: Prof. Dr. Sc. Tomislav Jemrić

Table of content:

- A brief description of apple and table grape ripening
- Proper sampling for maturity assessment
- Maturity assessment tests
- Postharvest protocol
- Factors affecting postharvest quality
- Fruit defects and disorders



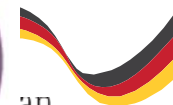
Plodove namijenjene dugotrajnom čuvanju treba brati kada dođe do promjene osnovne boje iz zelene u žutu, a plodovi koji će se otpremiti odmah na tržište ili čuvati kratko mogu biti s promjenom boje iz žute u krem.

Slika 1 -
Mjerenje IAD
Indeksa plodova
jabuke DA- metrom

Izvor: Dr. Macarena
Farcut, University of
Maryland



Slika 1 -
Optički
refraktometar
(lijevo) i digitalni
refraktometar
(desno)



anation
USAMMENARBEIT

Maturity assessment tests

- General recommendations for optimal values are given for each indicator
- Due to the limited scope, it was only possible to give general recommendations
- The purpose is to make the reader aware and refer them to further reading



sales of
to their
refoe, a
red fruits
ain years
udy and
lopment
u should
ment be-
tured.

stor-
heir
m

i-
are
ruits
hich is

Fruits intended for long-term storage are best harvested when their primary color changes from green to yellow. Fruits intended for immediate shipment to the market or short-term storage may exhibit a color change from yellow to cream.

Figure 1
- Measurement of the IAD index of apple fruits with a DA-meter

Source: Dr. Macarena Farcu, University of Maryland

Link: <https://extension.umd.edu/resource/how-can-growers-determine-apple-fruit-maturity-and-optimal-harvest-dates-fs-1180>



german
cooperation
DEUTSCHE ZUSAMMENARBEIT

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

FRUIT DEFECTS AND DAMAGES



6

Picture 6
- Petiole cavity rot

Source: OECD (2021), Apples, International Standards for Fruit and Vegetables, OECD Publishing, Paris,

<https://doi.org/10.1787/12ebba9f-en-fr>



8

Picture 8
- Jonathan's spot

Source: OECD (2021), Apples, International Standards for Fruit and Vegetables, OECD Publishing, Paris

<https://doi.org/10.1787/12ebba9f-en-fr>



10

Picture 10
- Glassiness/
watercore of fruits

Source: OECD (2021), Apples, International Standards for Fruit and Vegetables, OECD Publishing, Paris



7

Picture 7 - Bitter pits

Source: OECD (2021), Apples, International Standards for Fruit and Vegetables, OECD Publishing, Paris,

<https://doi.org/10.1787/12ebba9f-en-fr>



9

Picture 9
- Lenticel spots

Source: OECD (2021), Apples, International Standards for Fruit and Vegetables, OECD Publishing, Paris,

<https://doi.org/10.1787/12ebba9f-en-fr>



11

Picture 11
- Seed cavity rot

Source: OECD (2021), Apples, International Standards for Fruit and Vegetables, OECD Publishing, Paris

TABLE GRAPES DEFECTS AND DAMAGES



Figure 3
- Shriveled
berries and
browned stem

Source: OECD (2007), *Table Grapes*, International Standards for Fruit and Vegetables, OECD Publishing, Paris,

<https://doi.org/10.1787/9789264031302-en-fr>

Figure 4 –
Sulphur dioxide
damage

Source: OECD (2007), *Table Grapes*, International Standards for Fruit and Vegetables, OECD Publishing, Paris,

<https://doi.org/10.1787/9789264031302-en-fr>





Thank you!

