DUS TESTING FRUIT TREE SPECIES

Harmonisation of Technical Guidelines for Rambutan and Star Fruit

East Asia Plant Variety Protection Forum

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PREVIEW

- Introduction
- Differences from other species
- Growing trial
- Characteristics for fruit trees
- Evaluation and assessment
- Variety Collections

Introduction

I. The principles for DUS testing fruit tree species are **identical** to that for vegetables, field crops, ornamentals or any other plant genera or species

II. Any differences are largely due to plant cultivation and growth type

III. Variable factors which may affect results require attention and management

Difference from other Species

- *Length of Testing*

❑The length of time for the trial is longer comprising: the establishment period

the time to fruiting period

the evaluation period

❑ It is common practice for evaluation not to begin until the tree is sufficiently mature or has produced adequate fruit

Difference from other Species

- *Requirements for Flowering and Fruiting*

- ❑Pollinators
- ❑Sufficient polliniser varieties or types
- ❑Environmental Conditions
- ❑Time periods

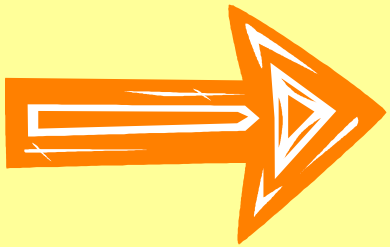
Difference from other Species

- *Fruiting*

❑Crop load (fruit number)

❑Management

❑Health



Representative fruit sample for that variety

Difference from other Species

Fruit varieties include varieties used as rootstocks

Rootstocks are grown as a tree on their own roots.

Tested as a “fruit” variety and may include fruit characteristics

Rootstock-scion interactions are **not** considered

The Growing Trial

Tree management and rootstocks

In order to manage variability between trees, all trees in the plot must be subjected to the same cultural practice and propagated by the same method.

In particular, if a rootstock is used, that rootstock needs to the same for every tree

The Growing Trial

- Number of trees
- The number of trees is usually low which can impact the assessment of uniformity
- A low tree number leads to sampling few external replicates (trees) but potentially many internal replicates (fruit, leaves)

The Growing Trial

External replicates = number of trees

Internal replicates = number of fruit, leaves or flowers from an individual tree

The Growing Trial

Tree size can also influence evaluation method and sampling:

- The method of observation
- Sampling method

Characteristics

A **tree** provides the possibility of a large number of organs; tree, stem, leaf, flower and **fruit and fruit parts;** skin, flesh and seed

BUT

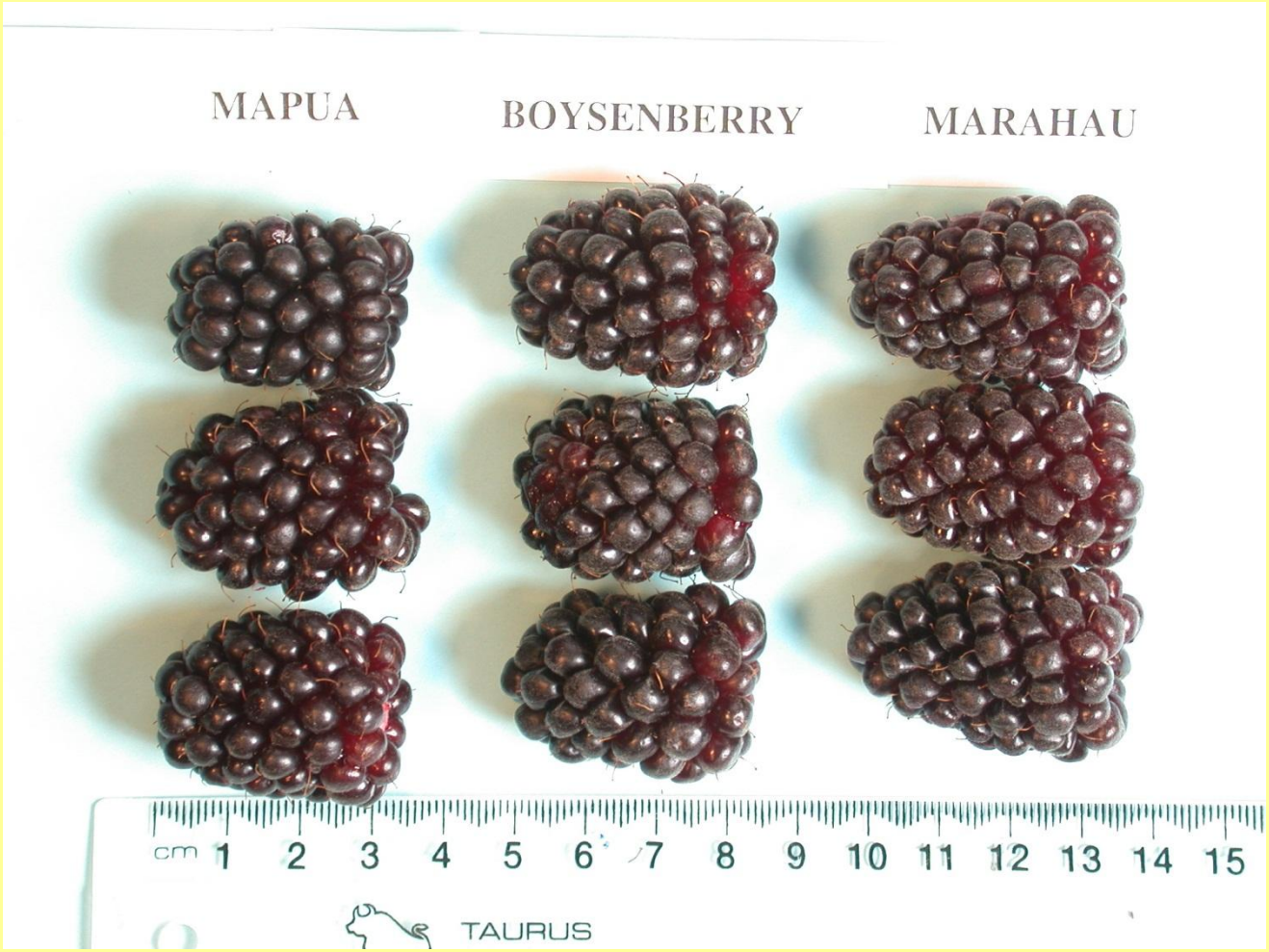
Any characteristic must meet the criteria for a characteristic useful for DUS

Consistent and repeatable, having sufficient variation, precise definition and allows uniformity assessment

Characteristics

Specialist fruit characteristics

- sweetness (Brix as an indicator)
- acidity
- time of maturity
- habit of fruiting
- skin colouration; distribution, hue, intensity


MAPUA
BOYSENBERRY
MARAHAU
cm 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TAURUS

Characteristics

Variation in expression and sampling

The expression of a characteristic on a tree can vary greatly depending on the position

Fruit colour on the outside of a tree may be stronger due to higher light levels than colour expression inside the tree

Question: is the organ sample representative of the variety?

Outside of the tree

Inside of the tree

Evaluation and Assessment

Many characteristics are evaluated off the tree and in the lab/workroom

This allows for the possibility of specialist techniques;

- firmness with a penetrometer
- acidity with titration

And the possibility for techniques to assist in the determination of distinctness

Randomised Blind Testing

Evaluation and Assessment

UNIFORMITY

Important to remember that uniformity assessment is a comparison between whole trees, not of individual organs within the tree.

Question?

What is the level of variation of organs within a tree that indicates an off type tree?

Variety Collections

A collection can consist of:

- permanent and living
- temporary and living (the growing trial)
- databases; photographs and descriptions
- a combination of the above

Important for fruit species due to the length of testing and long term management of variables

Variety Collections

Consider:

- what is needed
- cost and usage
- management plan

- The Longer Term

Variety Collections

Management

- Varieties to include
- Variety listing and recording
- Tree maintenance and health
- Tree replacement policy
- True to type testing

THANK YOU