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**SOME OBSERVATIONS AND SUGGESTIONS ON THE USE
OF EXPLANATORY DIAGRAMS IN FRUIT GUIDELINES**

*Document prepared by experts from New Zealand, South Africa
and the United Kingdom*

Some Observations and Suggestions on the Use of Explanatory Diagrams in Fruit Guidelines

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Introduction

In recent years, there has been discussion within UPOV working parties and the Technical Committee regarding the standardisation of states of expression and of Test Guidelines as a whole. In particular, I refer to documents TWF/28/7 and TWF/28/9.

During New Zealand's revision of the Kiwifruit Guideline a number of problems relating to explanatory diagrams and botanical terms have arisen. In discussion with other members of this working party it became clear that similar problems had also arisen during the revision or preparation of other fruit guidelines. There did not appear to be any consistent solution applied or common principle followed. This suggested that explanatory diagrams and key botanical terms should be in some way be standardised in a similar manner as proposed for the table of characteristics.

With respect to standardising test guidelines, we should keep in mind the increasing number of UPOV member states and the resulting increased use of Test Guidelines by countries with perhaps limited DUS testing experience.

Some Inconsistencies and Possible Solutions

The "Correct" Diagrams

The fundamental problem with some botanical diagrams is not one of our own making. When deciding on botanical terms, reference is usually made to a standard published text. The published texts referred to in this discussion paper are the Royal Horticultural Society Dictionary of Gardening, Stearn's Botanical Latin, Radford's et al Vascular Plant Systematics and Hortus Third. This appears to be a sensible approach, however there is inconsistency between texts. An example is the diagram for the leaf apex shape, *acuminate*. The diagram differs in three different texts. Which is the "correct" one? In a broader sense there appears to be a poor understanding within UPOV test guidelines of the terms acute, abruptly acute, acuminate and apiculate. Examples in Quince TG/106/3, European Pear TG/15/1, Mango TG/111/3 and Avocado TG/97/3. This leaf shape example highlights another inconsistency. Is the top of a leaf blade the apex or the tip? Once again published texts seem to differ.

The solution could be to have a UPOV document of diagrams drawn from existing published texts. This does not mean that one particular published text is formally adopted or favoured. The taxonomic diagrams for this document already exist. Technical experts would need to decide which diagrams and botanical terms are the most representative and assemble them in a useable form for future test guideline preparation and revision. The UPOV botanical shape document would be a collection of the most representative diagrams from existing texts. The purpose of this UPOV diagram set would be to assist in the preparation and revision of guidelines. For example, the characteristic Fruit: shape is required. The expert would go to the document and select the most representative diagram that fits that particular fruit shape expression.

Diagram Quality

The diagrams are inconsistent and of variable quality. The actual diagram should fit the state of expression and clearly explain the state. In some cases the state of expression is no doubt accurate, however the diagram is not completely representative. We must at the same time be practical. Not all real states of expression in fruit species will perfectly match published taxonomic diagrams. We should aim to be as accurate and representative as possible. The Strawberry guideline TG/22/9 has fruit shapes conical and cordiform. On inspection the diagrams are very similar with differences not immediately obvious. This is also true of obovate and ovate leaf shape diagram in Quince TG/106/3. The diagrams do not clearly show whether the broadest part is above or below the middle.

The diagrams for leaf margins are relatively good, however the diagram should clearly demonstrate differences between close states such as crenate and dentate or serrate and biserrate.

A possible method to increase diagram quality would be to standardise diagrams by preparing a UPOV diagram document based on existing published texts as suggested earlier in this discussion.

States of Expression And Their Representative Diagrams

The previous paragraph has covered the quality and accuracy of the diagram used. The states of expression themselves should also be checked. In describing shape and form we should use terms that are actually shapes. In Apple TG/14/8, Persimmon TG/92/3 and Cherry TG/35/6, one of the fruit shape states of expression is “flat”. Is “flat” a shape? I suggest that it should be oblate, globose or transverse ellipsoid as appropriate. In Chestnut TG/124/3, transverse ellipsoid is used as a state of expression for nut shape. This problem also arises in description of leaf tip/apex and leaf base. Sometimes it is not absolutely clear whether the characteristic is describing the shape or the angle. In Japanese Plum TG/84/3 the characteristic is Leaf blade: angle of the tip. One of the states of expression is pointed. This is a shape, not an angle. In European Pear TG/15/1, a similar characteristic Leaf blade: shape of the tip, is used. One of the states is “point absent”. Again this is not a shape and should more accurately be described as round.

This characteristic again raises the question. Do we use tip or apex? It is my view that apex would be the preferable term. Apex implies the complete upper portion. In some cases, tip could imply the very tip and this has some significance in shapes such as mucronate, cirrhose, aristate and caudate. It could be argued that, for these leaf forms, the apex is different from the tip. European Pear TG/15/1 demonstrates this problem for leaf bases. The characteristic states shape, however most of the states of expression and the diagrams are describing the angle.

Once again the solution to these inconsistencies would be some form of standardisation and reference to a UPOV approved diagram or botanical term document. This group should in future be more rigorous in checking that a diagram matches the state of expression and the characteristic.

Solid And Plane Shapes

There are two basic shape forms, solid and plane. The type of character should determine whether plane or solid shapes are used. If the character is essentially a two dimensional one (e.g. leaf blade) or requires a particular perspective such as “in profile” or “longitudinally”, then the plane form should be used. If the character is a general shape of a three dimensional feature such as seed, stone or fruit, then the solid form should be used. The Quince TG/106/3 and Mango TG/111/3 guidelines contain examples where plane and solid shapes are used together in the same character. There does appear to be some confusion between terms such as broad elliptic and broad ovate, lanceolate and narrow lanceolate. A particular problem with describing fruit shapes is the way a fruit is positioned on the tree. The critical detail to note is the point of attachment or where the base of the fruit is. With ovate/ovoid and obovate/obovoid shapes this is particularly important and must be looked at carefully. In published text diagrams, the base is always at the bottom. Many fruit hang from trees and the base is at the “top”. For TWF purposes, ovate/ovoid should be described as the broadest part closest to the stalk and the reverse for obovate/obovoid. For many diagrams the orientation is significant; the stalk, petiole or some other reference point should be present.

A solution could be to establish criteria that outlines clearly when plane or solid shapes should be used for the relevant characteristics. The basis of determining shapes could form around the five main forms; elliptic, oblong, ovate, obovate and triangular. Within each main group, there would be a subset series representing all the shapes within that main group.

Conclusion

This brief analysis of existing fruit guidelines suggest that the consistency and general accuracy of explanatory diagrams and related states of expression could be improved. Our use of terms is not helped by inconsistencies in published texts. As stated as possible solutions, a UPOV document of representative diagrams and related botanical terms could be put together using appropriate published definitions. This task could be carried out by a small number of people but would require the assistance of and consultation with this whole working party.

Attached are definitions and diagrams of leaf apex characters and general shape characters taken from the acknowledged references. These two types of characters seem to be

the most inconsistent in fruit guidelines and are good examples to begin the proposed standardisation with. Also attached is a list of definitions from TWF/27/16.

References

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[The Annex follows]

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ANNEX

THE NEW ROYAL HORTICULTURAL SOCIETY DICTIONARY OF GARDENING
(RHS ENCYCLOPEDIA)

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HORTUS THIRD

BOTANICAL LATIN STEARN

VASCULAR PLANT SYSTEMATICS — RADFORD *et al.*

VASCULAR PLANT SYSTEMATICS — RADFORD *et al.*

VASCULAR PLANT SYSTEMATICS — RADFORD *et al.*

VASCULAR PLANT SYSTEMATICS — RADFORD *et al.*

BOTANICAL LATIN

GLOSSARY OF BOTANICAL TERMS

