

INF.5 (COPA/COGECA)

UNECE RECOMMENDATION FOR APPLES

Transmitted by:

COPA/COGECA, on behalf of all members

Introduction:

UNECE Standard FFV-50 concerning the marketing and commercial quality control of APPLES as adopted by the Working Party at its 59th session will conclude its trial period in November 2005.

On the European side, on 1st August 2005 Commission Regulation (EC) No 85/2004 will fully enter into force in 25 Member States, providing minimum size reductions. Furthermore, the European Commission, in his Working Document on this issue (DTR/AGRI C4_46/2004) also proposes the introduction of quality criteria based on sugar content (°brix) and firmness (kg/cm²).

Both UNECE and EC requested interested parties and Member States to provide research data and scientific opinions to evaluate and consider the suitability of current standard provisions for sizing and quality criteria and their potential effects in the global fruit markets.

In this paper COPA/COGECA presents the research results of two different studies, conducted during the same period in Southern and Northern Europe (Italy and Belgium) and sustained by a considerable number of Members States' producers organisations, in the aim of emphasize the need for *"individual countries/regions [...] to establish their own maturity standards, since it would be unreasonable to expect that standards can be simply transferred between countries or between cultivars"*.¹

Methodology notes:

Cultivars:

Italy: Golden Delicious, Red Delicious (Red Chief clone), Gala

Belgium: Elstar, Jonagold, Braeburn

Parameters measured:

1. Content of soluble solids (refractometric method)
2. Firmness
3. Starch conversion (only Belgium)
4. Streif Index
5. Background color

The Italian researches have also considered parameters variability with Low and High crop load.

¹ TRADE/WP.7/GE.1/2004/9, Page 6, Appendix One, Transmitted by *New Zealand* (Specialized Section on Standardization of Fresh Fruit and Vegetables, Fiftieth Session, Geneva, May 2004)

Batches:

Italy: 200 apples for each cultivar both in mountain areas (600-700m) and valley (200-250m) picked on the same day (apart for Gala)
Belgium: 16 batches of 100 apples each, picked on the same day

Results Analysis and Considerations:

a) Really High Inter- and Intra-Regional differences:

Our researches have highlighted, as expected from the beginning, a really elevated interregional variability. Such variability is surely not astonishing for anyone deeply involved in fruit production, as it obviously depends on many more unpredictable conditions than any manufactured good. Different cultivars grown in different countries cannot be easily reduced to a single quality provision, because of climate, altitude and all the environment variables which are involved in fruit growing.

In addition to interregional variability, our studies have stressed a set of intra-regional differences, which need to be investigated before any final decision. In particular, the Italian area of Trentino (producing about 400.000 tons/year – 4% of EU-25 production) is highly concerned – because of geographical reasons – by the unexpected relevant differences discovered between °brix values in the valley and mountain areas belonging to the same productive region, in some cases under the minimum limit proposed by the EC (observed specifically for Golden Delicious. Ref: EU proposal for sugar content in DTR/AGRI C4_46/2004).

In this frame, environment has to be considered as a basic variable which could overcome any quality/size consideration. If this is a positive factor, we cannot forget that, in different seasons, environment could influence production in a negative way and, if not taken properly into account in the legislation, produce a not predictable set of negative effects.

We would like to stress that, from a production point of view, Golden Delicious cannot be considered an irrelevant variety, representing 26% of EU-25 apple production (in 2003 : 2.638.000 on a total 9.922.000 tons production - AGRI.C.4/POM10/04).

b) Correlation weight/sugar and weight/firmness:

EU Regulation 85/2004 ("Whereas" No 3) states:

*"In view of the recent technical developments concerning methods for measuring firmness and sugar contents as well as emerging new markets for small-sized mature apples, the minimum size for apples applicable in the Community should be reduced, new maturity criteria such as sugar content and firmness ensuring that such a reduction of the minimum size **does not imply fruits insufficiently mature and/or developed are placed on the market.**"*

In the same perspective, UNECE standard FFV-50 affirms:

"The development and condition of the apples must be such as to enable them:

- to continue their ripening process and **to reach the degree of ripeness required in relation to the varietal characteristics**
- to withstand transport and handling, and
- to arrive in satisfactory condition at the place of destination.”

We obviously understand and sustain the idea of removing fruits insufficiently mature or developed from the international market, therefore we do not agree on the fact that, at the actual stage of production and considering available technology, quality criteria intended as above (minimum °brix and firmness) could improve quality of fruits and consumer satisfaction better than the actual legislation.

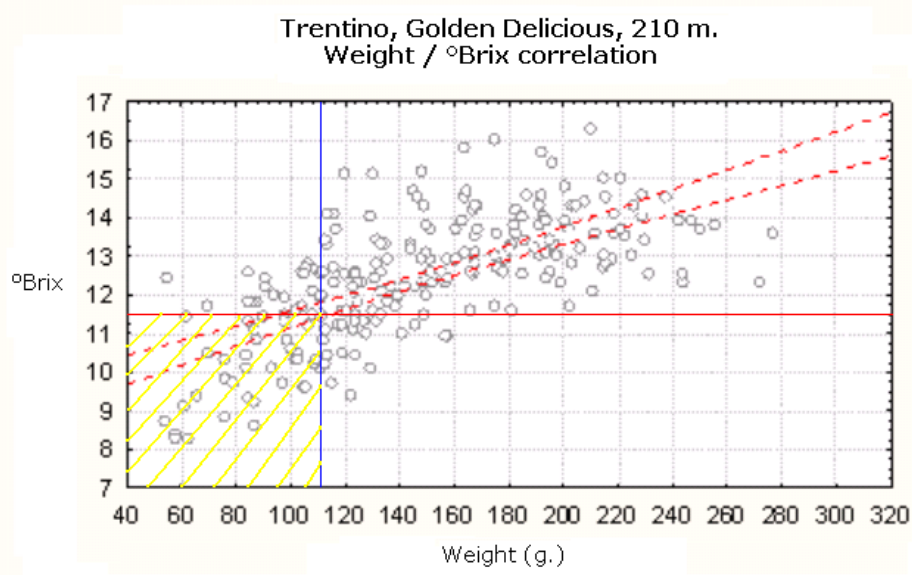
Our studies emphasize the **existence of a direct correlation between weight/size and °brix level, as well as a stricter correlation between weight and firmness**, which could assure the level of quality needed on the market utilizing traditional parameters (weight or size) without imposing on the production world a set of requirements that couldn't be easily satisfied with the actual technology, not even in the most advanced countries.

In particular – as a consequence of the correlation between the parameters – a quality system based on weight/size is already able to remove from the market the bulk of apples not reaching a sufficient degree of ripeness, is really simple to be implemented – being based on a well-know technology – and allows controls to be performed in a continuous way, and not merely by sampling.

Southern European Area, see below: *Trentino, Golden Delicious, 210 m.*

Please note:

- *Red horizontal line*: 11.5 °brix level (EC proposal for Golden Delicious – see DTR/AGRI C4_46/2004)
- *Blue vertical line* (110 grams, actual minimum weight for Class I)
- ***Yellow area (bottom left)***: fruits of lowest quality, which are **already excluded from the market**



Focusing on the Northern European area, the results show a positive and comparable relation even after 1 month of storage, as highlighted the chart below.

Northern European Area, see below: *Belgium, Jonagold*.

Please note:

When letters showed in the column "Duncan Grouping"² are different (A, B, C, D), a **statistically significant correlation** is established, meaning that **°brix value and weight/size are directly related**.

Duncan Grouping	Mean	N	size
A	13.5358	159	m80
A			
A	13.5328	160	m75
B	13.2300	160	m70
C	12.8423	160	m65
D	12.5604	159	m60

c) Need to consider all variables before legislation is approved:

Apples, as many other fruits, can be considered as a whole only from a wide-ranging point of view. Looking into specific characteristics of different cultivars (i.e. varieties), everyone would recognize – already at a superficial level – many fundamental differences. From a scientific point of view, such connotations imply the need to study each major cultivar independently, without falling into the trap of extrapolating specific results and considering some parameters as appropriate for the whole "apples" category.

In particular, EU Directive 2001/109/EC states (ex Article 1): "*Member States shall carry out during 2002 [...] surveys on plantations of certain species of fruit trees existing on their territory*". Article 2 specifies that "*enough varieties shall be shown to enable a separate assessment to be made for each Member State, by variety, of at least 80 % of the total area*".

² *Duncan's new multiple range test* is a type of multiple test used to make comparisons of means after a significant result has been obtained.

planted with fruit trees of the species in question and, in any case, all varieties representing 3 % or more of the total area planted.”

As a result, the Italian Orchard Survey 2002, in its preliminary official results³, lists – for what concerns the **Red Delicious Group** – the **following varieties**: *Red Chief* - *Red Delicious* - *Classic* - *Delicious comune* - *Early Red One (Erovan)* - *Eden Spur* - *Hapke Delicious* - *Harrod Red* - *Hi Early* - *Oregon Spur* - *Red King* - *Richared* - *Scarlet spur evasni* - *Stark Delicious* - *Stark Spur Red* - *Starking* - *Superstarking* - *Well Spur* (total of **18 sub-varieties and clones**, generally grouped and labelled with the word "Spur").

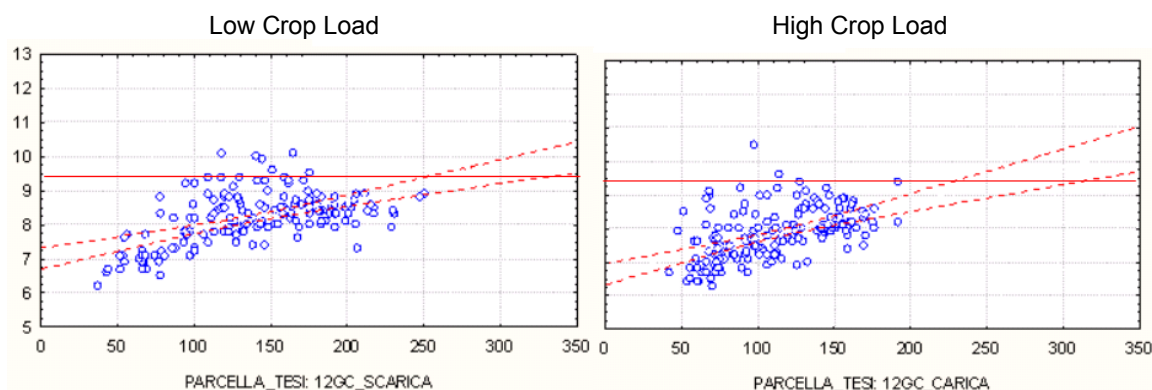
EC working document on Maturity Criteria for Apples (DTR/AGRI C4_46/2004) included, in the category for which a minimum of 9.5 °brix is proposed, "*Granny, Idared, groups of Red and Reinette*". We would like to stress first of all the lack of coherence of this oversimplified approach with the EU Directive quoted above, but, most important, we want to underscore the **absolute need to deepen our knowledge of different varieties and clones**.

We investigated, in our study, the **Red Chief** clone in Italy (weighting around 5% of national production, and occupying an important position in orchard renewals), and we must affirm that **such a clone cannot be hurriedly incorporated into a general "Red Group"**.

Southern European Area, see below: *Trentino, Red Chief, 210 m*.

Please note:

- *Red horizontal line*: 9.5 °brix level (EC proposal for "group of Red" – see DTR/AGRI C4_46/2004)



Such a cultivar has been studied in two different crop load situations (low and high – see above) and we can affirm – as a general result – that **sugar content (°brix) shows major discrepancies if we focus our attention on the clones of the main varieties**. The Red Chief clone has been for years one of the protagonists of the Red Delicious orchard renewal process, and it hasn't been investigated nearly at all, even if it represents a significant percentage of Red Delicious production.

The **graphs above** show that, if complete studies on cultivars and clones will not be carried out before the legislation come into force, **some cultivars and clones production could be cut off of 90% and therefore will not be marketable at all**.

³ <http://www.istat.it/Comunicati/Fuori-cale/allegati/Principali/frutticoltura-2002.pdf>

d) Importance of Good Agricultural Practices (GAP):

EU, UN and many related international institution stressed – in the last 20 years – the need to conform agricultural production to a set of general rules known as *Good Agricultural Practises*:

*"Good practices related to crop and fodder production will include those that **select cultivars and varieties on an understanding of their characteristics**, including response to sowing or planting time, productivity, quality, market acceptability and nutritional value, disease and stress resistance, edaphic and climatic adaptability, and response to fertilizers and agrochemicals"*⁴

EU-15 producers have understood since many years the advantages of conforming to such a set of general rules in the aim of reaching a major quality and to maintain a sound environment.

Even if differences between EU-15 and NM-10 shouldn't be underestimated, we feel the entire EU-25 production will soon fully comply with GAP, particularly for what concerns the *pruning* and *thinning* practises, coherently with the objective of obtaining apples of the best quality.

In this perspective, our research has studied the effects of *thinning* in improving general quality, particularly with regard to sugar content.

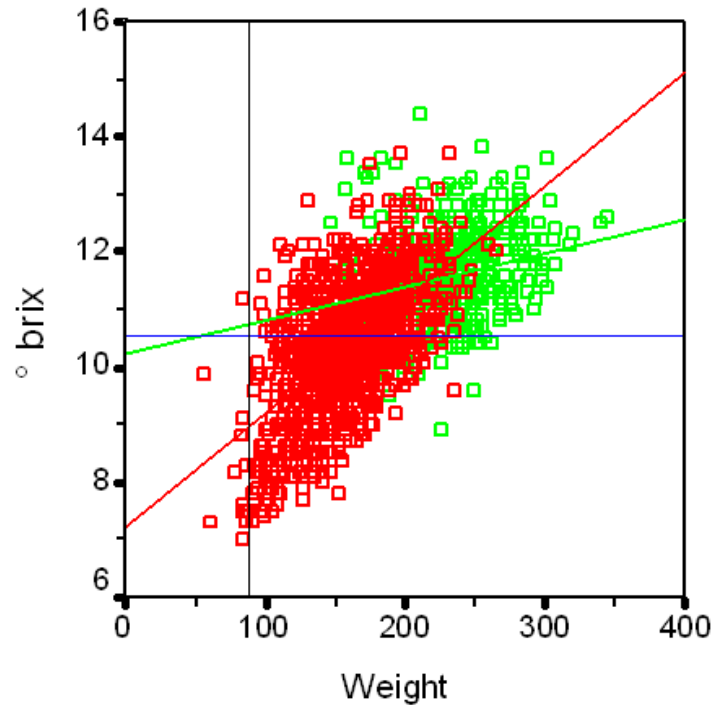
Southern European Area, see below: Gala⁵, Laimburg (Südtirol, 250 m. ca.)

Please note:

- *Green dots*: production from thinned trees
- *Red Dots*: production from un-thinned trees
- *Blue horizontal line*: 10.5 °brix level (EC proposal for "Gala" – see DTR/AGRI C4_46/2004)
- *Black vertical line* (80 grams, actual minimum weight for Class I)

⁴ FAO, Committee on Agriculture, Seventeenth Session, Rome, 31 March-4 April 2003, "*Development of a Framework for Good Agricultural Practices*", Annex, point vi

⁵ Because of cultivar's characteristics, Gala has been picked in two different moments, not on the same day, in order to reach an acceptable maturity level. For such a variety this practice has to be considered as normal and wholly accepted.



The graph above clearly shows that **applying Good Agricultural Practise reduces the need for quality parameters**, satisfying any sugar content minimum provision.

We therefore affirm that international institution should extensively focus on the GAP implementing process, which represents the **easiest and safest way to reach a quality level acceptable in a global perspective for consumers, traders and producers.**

Conclusions:

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Considering that in a) we affirmed and verified the existence of an **high inter- and intra-regional variability**, which **cannot be ignored** if the main aim is establishing fair and scientifically reliable regulations, and we revealed unexpected relevant differences between °brix values in areas belonging to the same productive region, such to underscore that environment has to be considered as a basic variable;

Considering that in b) we demonstrated the **existence of a direct correlation between sugar content (°brix) and weight of fruits**, which has to be regarded as a way to avoid further useless complications in the field of fruit quality and that we do not feel any need for a new system, based on the assumption that technologies needed to meet the new regulations are today normally available to European farmers;

Considering also that **controls** on quality parameters are not as easy to conduct as controls on size which, as demonstrated, can give a more than adequate result in avoiding inappropriate fruits to get into the market and the **lack of coherence** in legislation which

needs to be investigated (EC Regulation 1148/2001 - Annex IV permits up to 5% destructive controls, which is not acceptable considering the continuous drive to quality that EU producers have demonstrated in the last decades and is, additionally, clearly in conflict with the EU proposal⁶ to UNECE transmitted in May 2004, proposing that controls are demanded to inspector's personal evaluation and could include up to 5 fruits per ton, i.e. approximately 1 out of 1.000 fruits);

Considering – as stated in c) – that the **Red Chief** problem cannot be underestimated if the aim is the elaboration of general quality provisions, and certainly not a crisis of the horticultural sector in some of the major European apple-growing areas;

Considering, furthermore, that quality parameters are not limited to sugar and firmness, but include odour, flavour, acidity, astringency, juiciness – to quote the most important ones – and, at the actual stage of technology and research, we do not know how these independent variables behave and interrelate with each other and we need to implement such a quality system when in possession of a general knowledge on these parameters⁷;

Considering, as seen in d), that **Good Agricultural Practises**, as actually managed and applied in the most advanced fruit growing regions, are able to reduce the need for quality parameters, satisfying any sugar content minimum provision, and represent the easiest and safest way to reach a quality level acceptable in a global perspective for consumers, traders and producers;

1. *Reaffirms* European producers commitment to quality and consumer safety and satisfaction, nevertheless considering the whole fruit sector's need to univocal and scientifically based regulations considering all the data available and not implying contradictions which could lead to disputes and market crisis;
2. *Underscores* the need to establish a quality system technically easy to be implemented, avoiding any misunderstandings on which products are acceptable for the world fruit market and allowing international institutions to set an effective scheme of controls, not flawed by lack of coherence or inconsistencies;
3. *Emphasizes* the wide agreement between European producers in putting into practice all the Good Agricultural Practises needed to enhance quality of the products and – in the same time – guarantee an acceptable environmental impact;
4. ***Demands a 3 years delay before EC Reg. 85/2004 come into force, as well as a 3 years adjournment before setting up quality regulations, absolutely needed to conduct further studies and researches aiming to reach a full knowledge about geographical impact (inter- and intra-regional variability) and cultivars' characteristics consequences on quality parameters.***

⁶ Working Party on Agricultural Quality Standards, Specialized Section on Standardization of Fresh Fruit and Vegetables, May 2004, Geneva, Item 4(a) of the Agenda, INF.1 (European Community).

⁷ Roger Harker, *Report on standards relating to eating quality of apples and pears*, WAPA, 2002 - quoted by New Zealand in TRADE/WP.7/GE.1/2004/9, May 2004.

ANNEX 1

Recent Codex Alimentarius Developments

Codex Standard for Orange Juice Preserved Exclusively by Physical Means (CODEX STAN 45-1981)

The *Codex Standard for Orange Juice Preserved Exclusively by Physical Means* (CODEX STAN 45-1981) established, regarding to quality, the following provisions:

2. ESSENTIAL COMPOSITION AND QUALITY FACTORS

2.1 Soluble Solids

The soluble orange solids content of orange juice (exclusive of added sugars) shall be not less than 10.0% m/m as determined by refractometer at 20°C, uncorrected for acidity and read as °Brix on the International Sucrose Scales.

2.1.1 Where the juice had been obtained using concentrated juice with the addition of water, the soluble orange juice solids content shall be not less than 11% m/m as determined by refractometer at 20 °C, uncorrected for acidity and read as °Brix on the International Sucrose Scales.

Therefore, in his section 2.1.1 this standard provides that the Brix for reconstituted orange Juice shall be not less than 11.0.

The **Codex Ad Hoc Intergovernmental Task Force for Fruit and Vegetable Juices and Nectars** (hereinafter *Task Force*) met October 11-15, 2004 in Fortaleza, Brazil. The meeting of the Task Force was convened to consider, *inter alia*, the Brix provisions for certain fruits.⁸

Considering **Orange Juice**, the mean world Brix of the data submitted to the Task Force was 12.1. The USA presented some recalculated data and proposed 12.0 as the starting point for discussions, agreeing anyway to a Brazilian proposal of 11.8.

⁸ Report of the U.S. Delegate, 4th Session of the Codex Ad Hoc Intergovernmental Task Force On Fruit and Vegetable Juices and Nectars - http://www.fsis.usda.gov/regulations_&_policies/delegate_report_4tfj

The European Community proposed 11.2, citing consumer preference and a longstanding 11.2 minimum in the community. The European Community was joined by many other countries who also proposed 11.2 or lower citing consumer preference, palatability, economic disruption to go to a higher number and other issues, while the USA and Brazil were the only countries proposing a Brix above 11.2.

The USA finally proposed a **minimum range of "11.8-11.2 and consistent with the application of national legislation of the importing country but not lower than 11.2."**

This proposal was accepted by the Task Force.

We would like to affirm our satisfaction for this recent development, whose new approach implied shouldn't be underestimated but, on the contrary, considered as a possible positive solution also in the apple domain.

We would like to draw attention on this measure, which should be considered also for apples quality and size parameters, with the objective to maintain a minimum quality on the world market without a single compulsory level that, at the actual stage of research, we consider inappropriate.

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