

DESCRIPTOR LIST FOR "LEVEL 1" EUROFRU TRIALS

0. EXPERIMENTAL SITE

1. YEAR OF OBSERVATION

2. VARIETY

3. SANITARY STATUS

VT: virus tested

VF: virus free

NT: no tested

4. ROOTSTOCK

5. NUMBER OF TREES IN TRIAL

6. YEAR OF FIRST GROWTH IN ORCHARD

7. FULL FLOWER DATE. The date at which 80% of the flowers are opened and/or at which the first petals are fallen.

8. AMOUNT OF FLOWERING - based on a 1 - 9 scale, where :

1 : little or none flowers

3 : a few flowers

5: intermediate bloom

7: heavy bloom

9 : very heavy bloom

9. DROP (before picking) - based on a 1 -9 scale

1 : very weak

3: weak

5: intermediate

7 : heavy

9 very heavy

10. PICKING DATE(S). The number of picking dates (1, 2 or 3) shall give information about spreading out of maturity. The observations 12 to 24 will be performed on fruits sampled from the picking date which give the highest production.

11. AVERAGE TREE YIELD (/ kg) for each picking date - put down in 'varied observations" (§31) the number of eventual biennially bearing trees.

12. AVERAGE FRUIT WEIGHT (g) - from a 30 fruits random sample.

13. GRADING SIZE CLASSES (% of weight), from the 4yh growing year:

- < 60mm

- 60-65 mm

- 65-70 mm

-70-75 mm

- 75-80 mm

- 80-85 mm

- 85-90 mm

- >90 mm

code 0 no observation (general notation for all the list)

14. BRUISING - local symptoms appreciated from external (on the cuticle) and internal (under the cuticle) observations.
- 3 : low susceptibility. Neither external nor internal symptoms.
 - 5 : medium susceptibility : slightly browning on the cuticle; on a cross-section, slight browning under the cuticle.
 - 7 : high susceptibility : On impact areas, large external browning (more brown than for n°5 symptoms); deep symptoms (7 – 10 mm) on cross-sections.

15. FRUIT COLOUR

All the followed observations are assessed on 10-15kg samples of fully mature fruits. For long storage varieties, notations are performed after storage in fridge.

15.1 Ground colour

- 1 : Red
- 2 : Orange
- 3 : Cream-white
- 4 : Yellow ('Golden Delicious')
- 5 : Green-Yellow ('Cox's Orange Pippin')
- 6 : Green ('Granny Smith')

15.2. Over colour

- 1 : No over colour
- 2 : Orange
- 3 : Pink
- 4 : Red
- 5 : Dark red
- 6 : Purple
- 7 : Brown

15.3. Type of over color

- 1 : Striped ('Mondial Gala')
- 2 : Splashed ('Metrose')
- 3 : Slightly blushed ('Blushing Golden')
- 4 : Complete over colour- ('Red Delicious')

15.4. Amount of over color

- 1 : 1 - 25%
- 2: 26 - 50%
- 3: 51 - 75%
- 4: 76 -100%

The homogeneity of the distribution of over colour can be noted in "Varied observations"

16. CALYX END - based on a 3-7 scale

- 3 : closed
- 5 : half open
- 7 : open

17. FRUIT SHAPE - notes from 1.0 to 5.2 (see Annexe I).

18. HOMOGENEITY OF FRUIT SHAPE (BETWEEN FRUITS) - based on a 3-7 scale :

- 3 : homogeneous
- 5 : intermediate
- 7 : heterogeneous

19. EATING QUALITY (TASTE) - based on a 1-9 scale on fully mature fruits:

- 1 : extremely poor
- 3 : poor
- 5 : intermediate
- 7 : good
- 9 : excellent

20. TEXTURE - based on a 1 -9 scale, where :

1 : extremely coarse

3 : coarse

5 : intermediate

7 : fine

9 : extremely fine

21. JUICINESS - based on a 1-9 scale, where :

1 : very dry

3 : dry

5 : rather dry

7 : juicy

9 : very juicy

22. FIRMNESS (without skin) - recorded on 10 just ripen fruits. A penetrometer with an 11 mm probe is used.

The mean of 2 measures per fruit is recorded. The notation is based on a 1 -9 scale :

1 : 2.0 kg/cm²

2 : 3.0 kg/cm²

3 : 4.0 kg/cm²

4 : 5.0 kg/cm²

5 : 6.0 kg/cm²

6 : 7.0 kg/cm²

7 : 8.0 kg/cm²

8 : 9.0 kg/cm²

9 : 10 kg/cm²

23. SUGAR - refractometric index (/ soluble dry matter)

24. ACIDITY - in equivalents g. of malic acid / liter of juice.

This measure is assessed by neutralizing the total free acidity by a N/10 solution of NaOH. The titration method with phenolphthalein is preferred.

Method :

Dilute 10 ml of filtered homogenized apple juice in distilled water, add a few drops of phenolphthalein. Pour out, drop by drop, the NaOH solution until the pH reaches 8.2 (the colour of the solution becomes pink-orange).

For assessing the equivalents g. of malic acid /liter of juice, multiply the volume of poured NaOH (in ml) by 0,67.

Refractometric index and acidity will be measured on a juice extracted from a minimum of 5 fruits at random sample; a sample of 20 or 30 fruits could be ideal.

25. PESTS AND DISEASES SUSCEPTIBILITY IN GROWTH - with the abbreviation of each significant pest or disease (see Annexe 2) followed by an assessment of the damage

1 : very low susceptibility

3 : low

5 : medium

7 : high

9: very high susceptibility

Example : for a very strong attack of scab, the note is Vi 9.

26. MAXIMUM STORAGE LIFE IN FRIDGE (in month)

27. PHYSIOLOGICAL DISORDERS (see Annexe 3) - notation Cf §25.

28. STORAGE DISEASES (see Annexe 4) - notation Cf §25.

29. TREE DATA

Only one rmeasurement during the experimentation, between the 4th and the 5th growth

29.1 BEARING HABIT - according to J.M. LESPINASSE (in "Apple Descriptor - I.B.P.G.R.- see Annexe 5) :

- I : type "spur" ('Starkrimson') - 1W: type 'Wijcik McIntosh'
- II : type 'Reine des Reinettes', 'King of the Pippins'
- III : type 'Golden Delicious'
- IV : type 'Granny Smith'

29.2 TREE VIGOR appreciated by a note based on height and spread of adult trees

- 1 : extremely weak
- 3 : weak
- 5 : intermediate ('Smoothee')
- 7 : vigorous
- 9 : extremely vigorous

30. OPTIONAL OBSERVATIONS

30.1. DENSITY OF FOLIAGE

- 1 : very low density
- 3 : low density
- 5 : medium
- 7 : high density
- 9 : very high density

30.2. FRUIT ATTRACTIVENESS - based on a 1-9 scale, where

- 1 : extremely poor
- 3 : poor
- 5 : intermediate
- 7 : attractive
- 9 : extremely attractive

30.3. RUSSETING

AMOUNT

- 1 : no russetting
- 2 : only around the stalk or calyx cavity
- 3 : less than 1 0% of the surface
- 4 : more than 1 0% of the surface

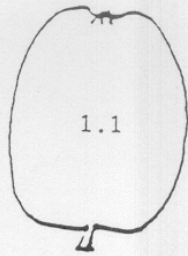
TYPE (from 'Apple descriptors' : IBPGR)

- 1 : extremely fine
- 2 : very fine
- 4 : intermediate
- 6 : coarse
- 8 : scaly
- 9 : crached

30.4. SHELF LIFE. recorded on 5 fruits , set in a small tray at the lab temperature for about 15 days. The early maturing varieties are experimented since the picking date. The late maturing varieties are taken out of the fridge after a storage period that the experimenter have to specify. 3 notations could be assessed :

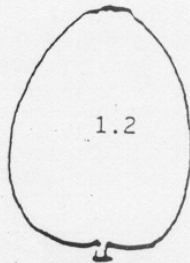
- taste - notation Cf §19.
- firmness - measured as in §22
- storage diseases and physiological disorders -notation Cf §27-28.

31. VARIED OBSERVATIONS



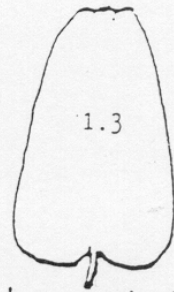
1.1

ellipsoid



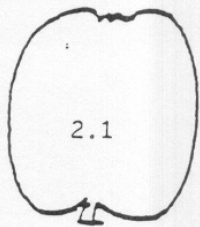
1.2

ellipsoid-conical (ovate)



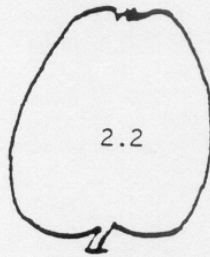
1.3

long-conical



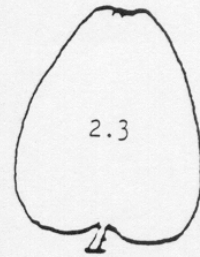
2.1

oblong



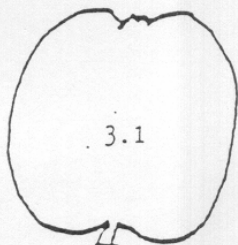
2.2

oblong-conical



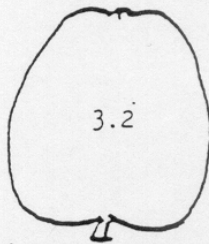
2.3

conical



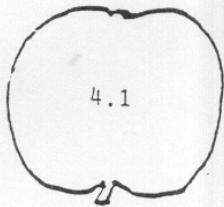
3.1

globose



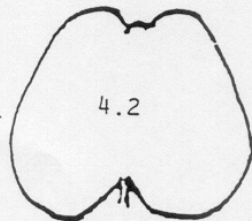
3.2

globose-conical



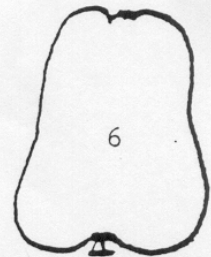
4.1

flat-globose (oblate)



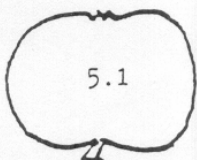
4.2

intermediate-conical



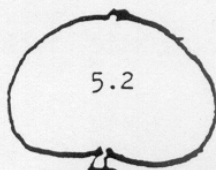
6

oblong-waisted



5.1

flat



5.2

short-globose-conical

MAIN DISEASES OR PESTS IN GROWTH

FUNGI

Apple scab	<i>Venturia inaequalis</i>	Vi
Collar rot, root rot	<i>Phytophthora cactorum</i>	Pc
Monilia	<i>Monilia fructigena</i>	Mf
Nectria canker	<i>Nectria galligena</i>	Ng
Powdery Mildew	<i>Podosphaera leucotricha</i>	PL

BACTERIA

Fire blight	<i>Erwinia amylovora</i>	Fa
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PESTS

Codling moth	<i>Cydia pomonella</i>	Cp
Green apple aphid	<i>Aphis pomi</i>	Ap
Leopard moth	<i>Zeuzera pyrina</i>	Zp
Red mite	<i>Panonychus ulmi</i>	Pu
Rosy apple aphid	<i>Dysaphis plantaginea</i>	Dp
Spider mite	<i>Tetranychus urticae</i>	Tu
Woolly aphid	<i>Eriosoma lanigerum</i>	El

Annexe 3.

PHYSIOLOGICAL DESORDERS

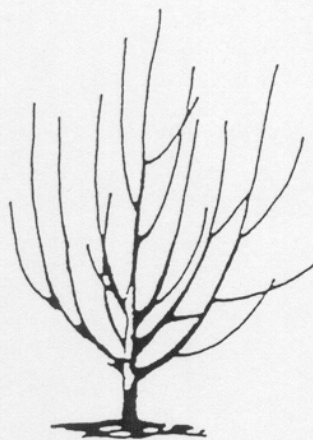
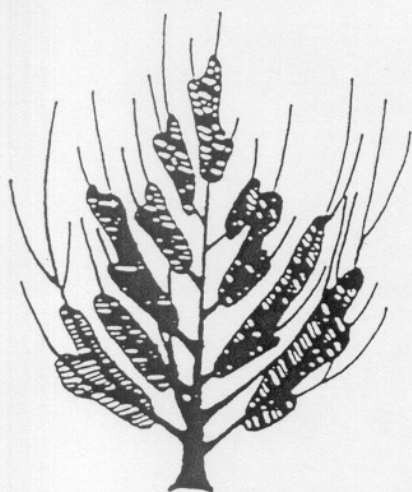
Bitter pit	Bp
Brown core	Bc
Senescent breakdown	Sb
Soft scald	Sos
Superficial scald	Sus
Watercore	Wc
Cracking	Cr
Russetting	Ru

Annexe 4.

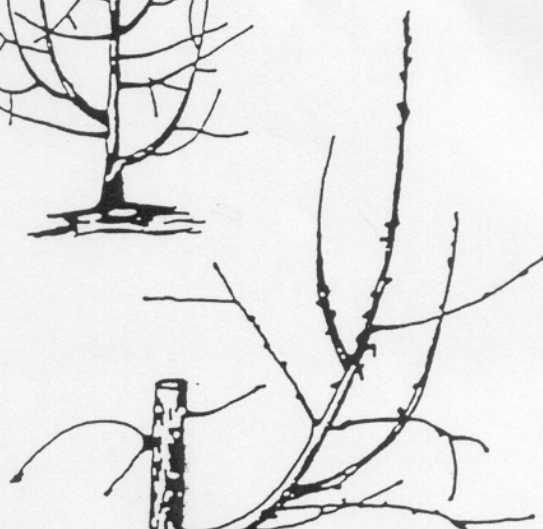
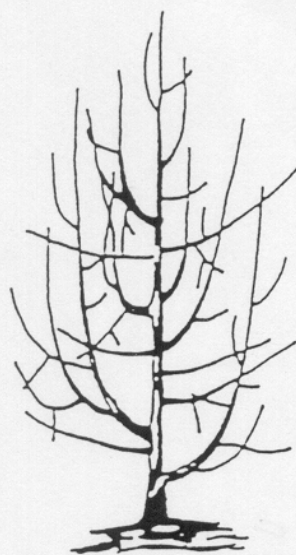
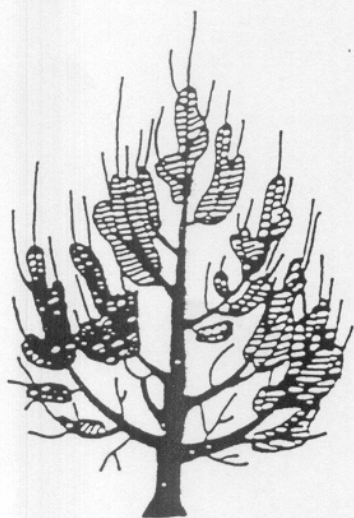
STORAGE DISEASES

(in importance order)

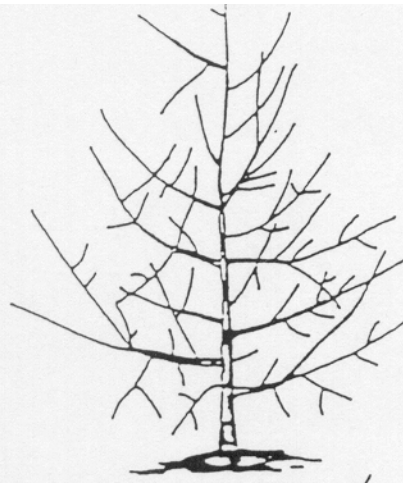
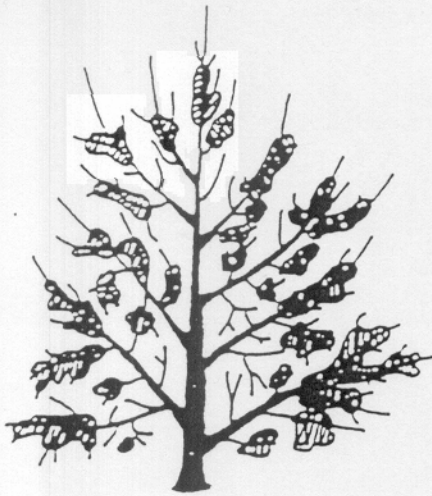
Gloeosporium	Gloeosporium rot	Gr
Alternaria	Alternaria rot	Ar
Penicillium	Blue mold	Bm
Botrytis	Grey mold	Gm
Monilia	Brown rot	Br
	Core rot	Cr
	Varied rot	Vr



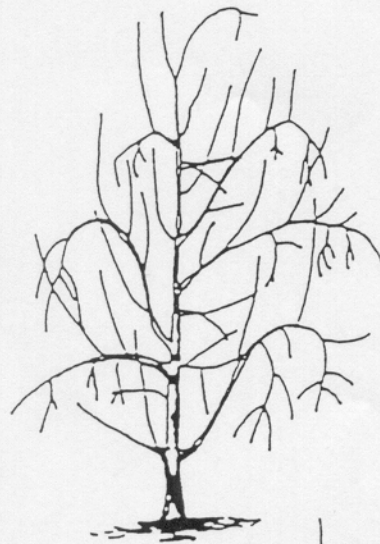
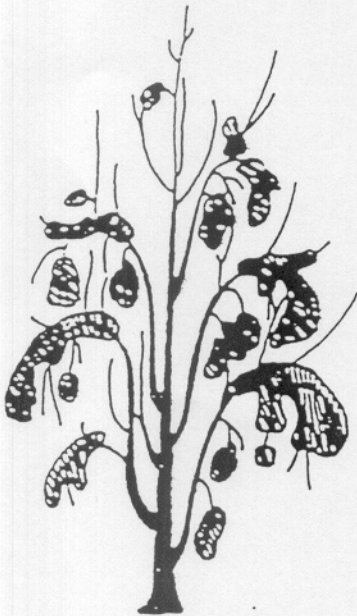
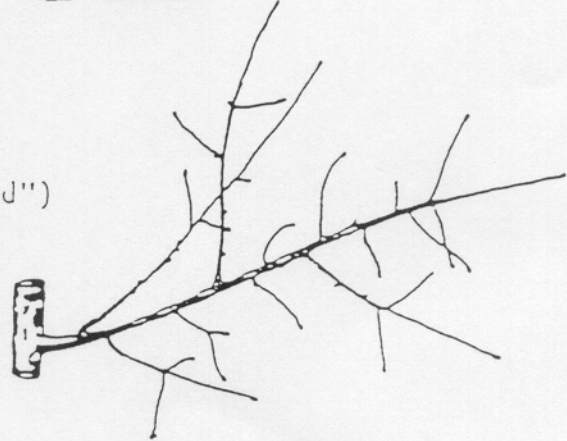
Type I, spur types, characterized by Starkrimson Delicious. Type I trees tend to be upright with narrow crotches and sparse branching. Fruiting occurs on numerous short spurs which are long lived. The zone of fruiting tends to remain close to trunk.



Type II, characterized by King of the Pippins. This is a variation of type I in which branching is more frequent and there is a greater tendency for the fruiting zone to move away from the trunk.



Type III, characterized by ("standard") Golden Delicious. Type III varieties tend to be spreading with wide crotches and frequent branching. They bear on spurs and shoots which are generally 1 to 5 years of age. The fruiting zone tends to move rapidly away from the trunk to the outside of the tree.



Type IV, the "tip bearers," characterised by Rome Beauty, Granny Smith, and Tydeman's Early Worcester. Type IV varieties tend to have upright main scaffold limbs with narrow crotches and frequent branching. They bear much of the crop on the ends of the previous year's shoots. There is a strong tendency for the lower half of the shoots to be without leaves or fruit, that is, "bare" or "blind." There is a strong tendency for the fruiting wood to be located at the extremities of the branches, with the tree

