Physical Assessment of Varieties

Table 1 contains information on some of the physiology of the tree itself. This includes the tree form (branching characteristics generally), vigor, degree of cold damage/resistance, mortality, leaf scab incidence, and evidence of canker diseases.

Tree form : Branch angles were measured, as a degree measurement from trunk to branch. Generally this is degree from vertical. A protractor/angle finder was used. A number of branches was used per tree and the averaged degree was recorded. Later, all percentages were assigned a value. These were represented as:

P (poor) : less than 35% F (fair) : 35 – 50% G (good) : 50-90%

Occasional comments concerning tree form occur under the note column.

Vigor : This was assessed through several approaches. The new growth was recorded (2014 season shoot extension) by measuring the five strongest shoots, and averaged. Secondly, the trunk diameter was measured 3 inches above the root flare, with a caliper. Lastly, the overall height was measured. These were all taken into consideration, along with our professional assessment regarding the age of the tree, its canopy extension and branch density. We reduced this all to a numerical value:

3 : Full vigor 2: Moderate Vigor 1: Low Vigor

Helpful in considering vigor is to observe some of the comments in the note category. Also, comparing other published commentary on the vigor of these varieties will show how the cultivars are performing in this climate and conditions. In some cases, stress from affectations like disease pressure, is weakening the tree and suppressing vigor. These stresses, due to the susceptibility of a particular variety, can arguably be viewed as an adjunct to the vigor, to be altered only through diligent cultural management. It should be repeated that all orchard areas are managed/fertilized in a similar fashion.

Dieback/Cold Damage : Two general methods of assessment were followed. Firstly, the prior season's (2013) growth was examined for cold damage from the previous winter. This included new shoot extension, and also spur examination. On smaller trees, at least 10 shoots and the same number of spurs calculated for injury. The number of damaged parts determined the

percentage affected. Some note was made of the degree of damage to each plant part (ie-length of dieback). Secondly, older portions of the tree were examined for winter damage, and occasionally some dissection was made. This second assessment was taken into account in the final assigning of susceptibility to cold. Dieback and other damage due to other factors was eliminated in this review. Finally, a ranking was given to each degree of damage:

1: less than 5% affected 2: 5-15% affected 3: 15% -49% 4: over 50% (severe winter injury)

Mortality : Signifies whether all, some, or none of the variety survived during the period 1997-2014. Letters represented : A (alive to date) D (accession(s) died during period).

It is helpful to view some of the information under the notes column, which mention whether other representatives survived and their general health. Also helpful is to check over the "Tree Mortality" document, and the "Trees Not Surviving " data sheet, which also contain additional commentary.

Canker Diseases : This assessment is more general. All trees were examined several times during the dormant and growing season for signs of pathogen induced cankers. A numerical value was given as a general assessment of the infections on the tree. In many instances specific diseases are mentioned, where confident diagnosis was able to be made.

1-few cankers 2-moderate (less than 10 lesions), non lethal 3- girdling, lethal or extensive a-anthracnose canker pc – perennial canker n- nectria wr – white rot br – black rot

0 = no signs of infection

Leaf Scab : Presence of foliar leaf scab. This was undertaken by a timed viewing. Two minutes was given to each tree specimen in which to locate scab lesions. This was originally done several weeks after petal fall. A second round of viewing occurred in late summer, of a lesser duration (1 minute per tree viewing). A simple Y (yes, lesions present) or N (no lesions found) was assigned. Note that a single lesion constitutes a Y verdict, regardless of severity.

Comments/Notes : As mentioned, these are included to add clarity to some of the reviews.

Anthracnose canker

apple scab lesions

Green apple aphids

Weather conditions