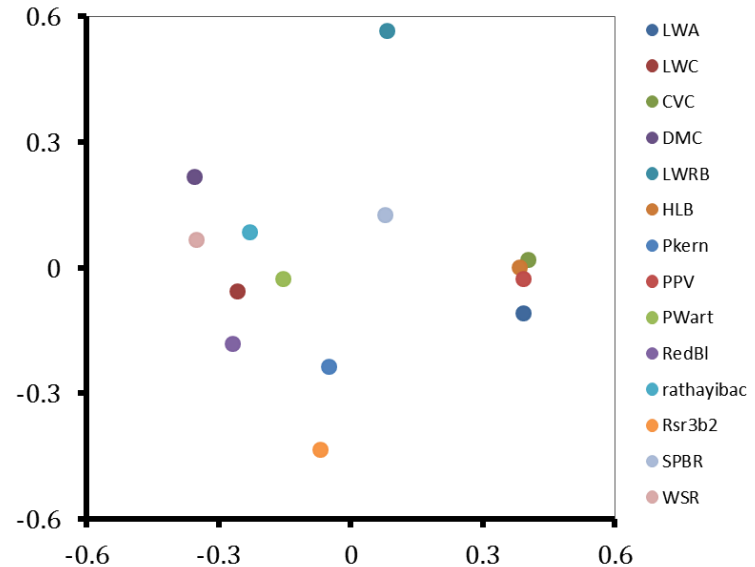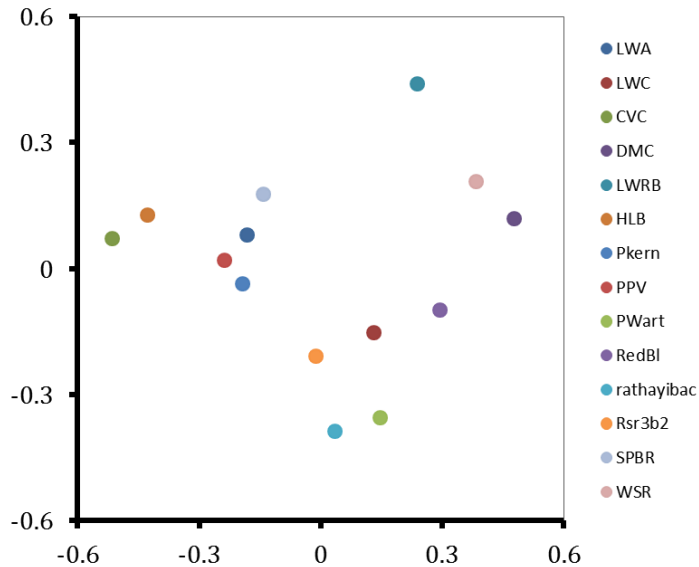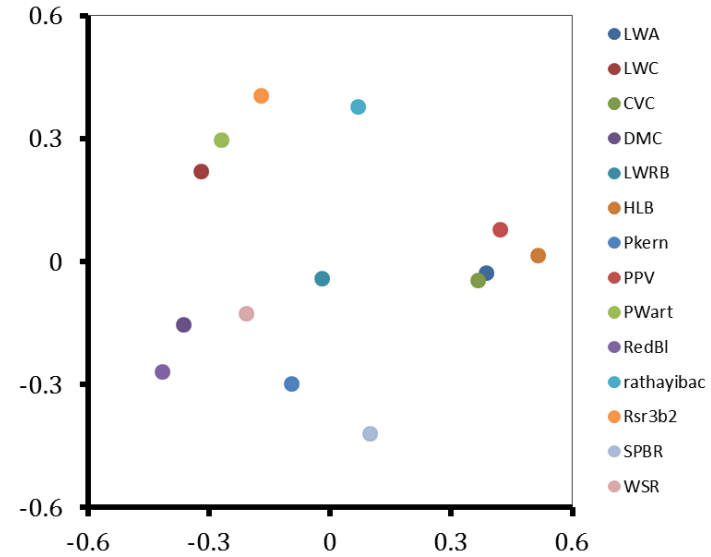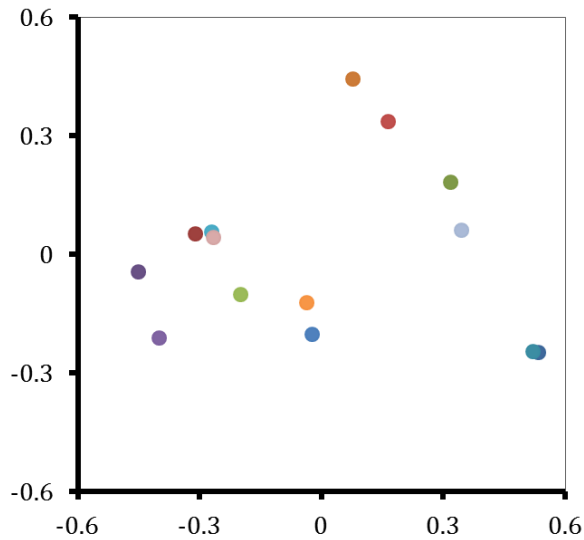# Making the Martyn Method a reality: Stage 2

Neil McRoberts & Carla Thomas
with
NPDRS Recovery Plan Experts

Projection of "distances" between diseases according to four raters

ANOVA associated with GPA

	fit	residual	total	%residual
LWA	5.817	2.578	8.396	10.844
LWC	4.134	0.274	4.409	1.154
CVC	8.957	0.554	9.511	2.330
DMC	8.415	1.782	10.198	7.497
LWRB	8.547	3.476	12.023	14.621
HLB	9.173	1.222	10.395	5.141
Pkern	0.029	2.989	3.018	12.573
PPV	6.292	0.415	6.707	1.746
PWart	3.945	1.072	5.017	4.510
RedBl	6.380	1.605	7.985	6.749
Rathyibac	3.232	2.477	5.709	10.417
Rsr3b2	3.586	2.282	5.868	9.596
SPBR	3.530	1.032	4.562	4.340
WSR	4.185	2.017	6.202	8.482
Totals	76.223	23.777	100.000	

	% fit S.S.
rater a	21.39864
rater b	24.88994
rater c	28.09269
rater d	25.61872

LWA, Laurel wilt of Avacado; **LWC**, Late wilt of corn; **CVC**, citrus variegated chlorosis; **DMC**, downy mildew of corn; **LWRB**, Laurel wilt of red Bay; **HLB**, Huanglongbing; **Pkern**, *Phytophthora kernoviae*; **PPV**, Plum Pox virus; **PWart**, Potato wart; **RedBl**, Red Blotch; **Rathayibac**, *Rathayibacter toxicus*; Rsr3b2, *Ralstonia solanacearum* race 3 biovar 2; **SPBR**, Scots Pine blister rust; **WSR**, wheat stem rust.

Similarity analysis based on reduced data set
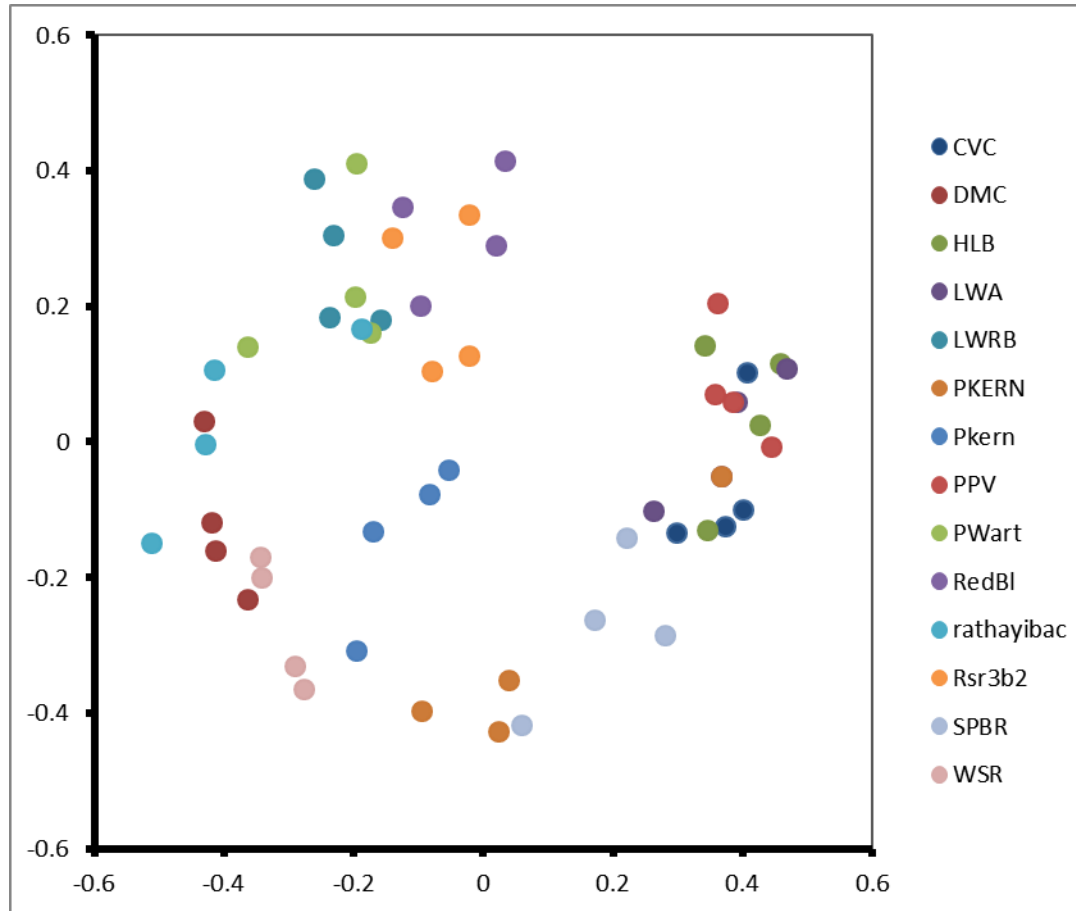
Second round compared with first

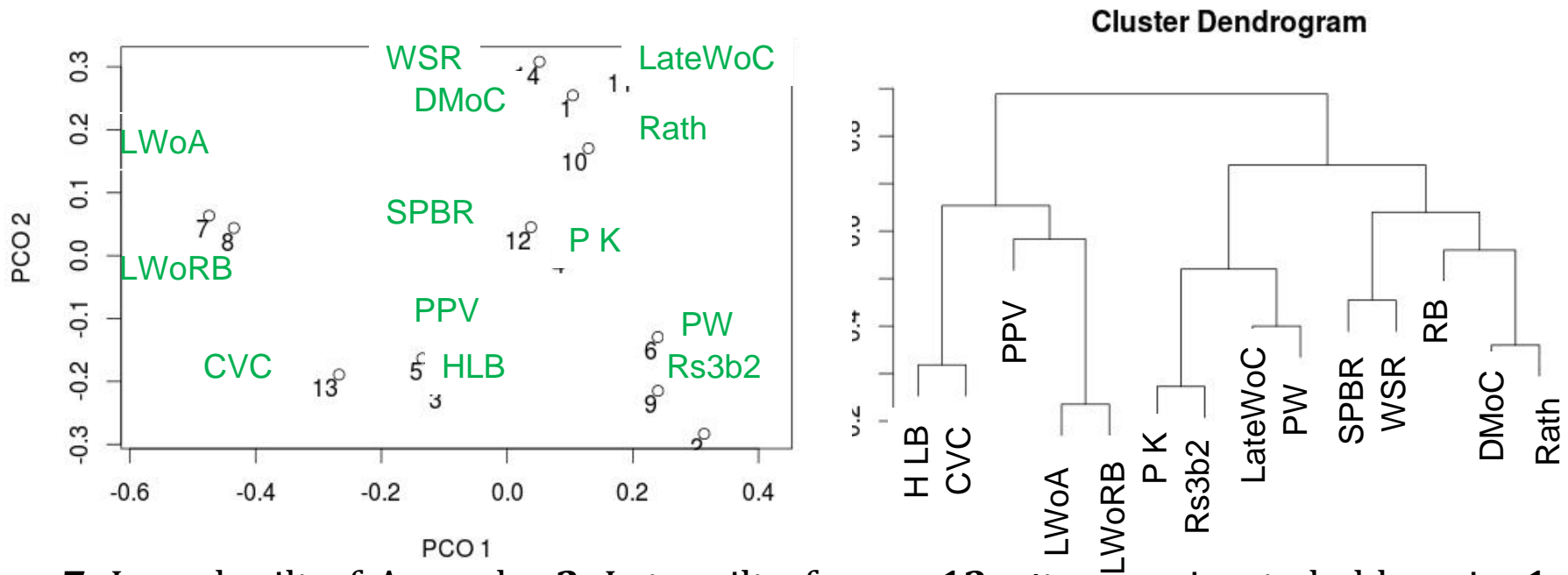

General Procrustes Analysis map
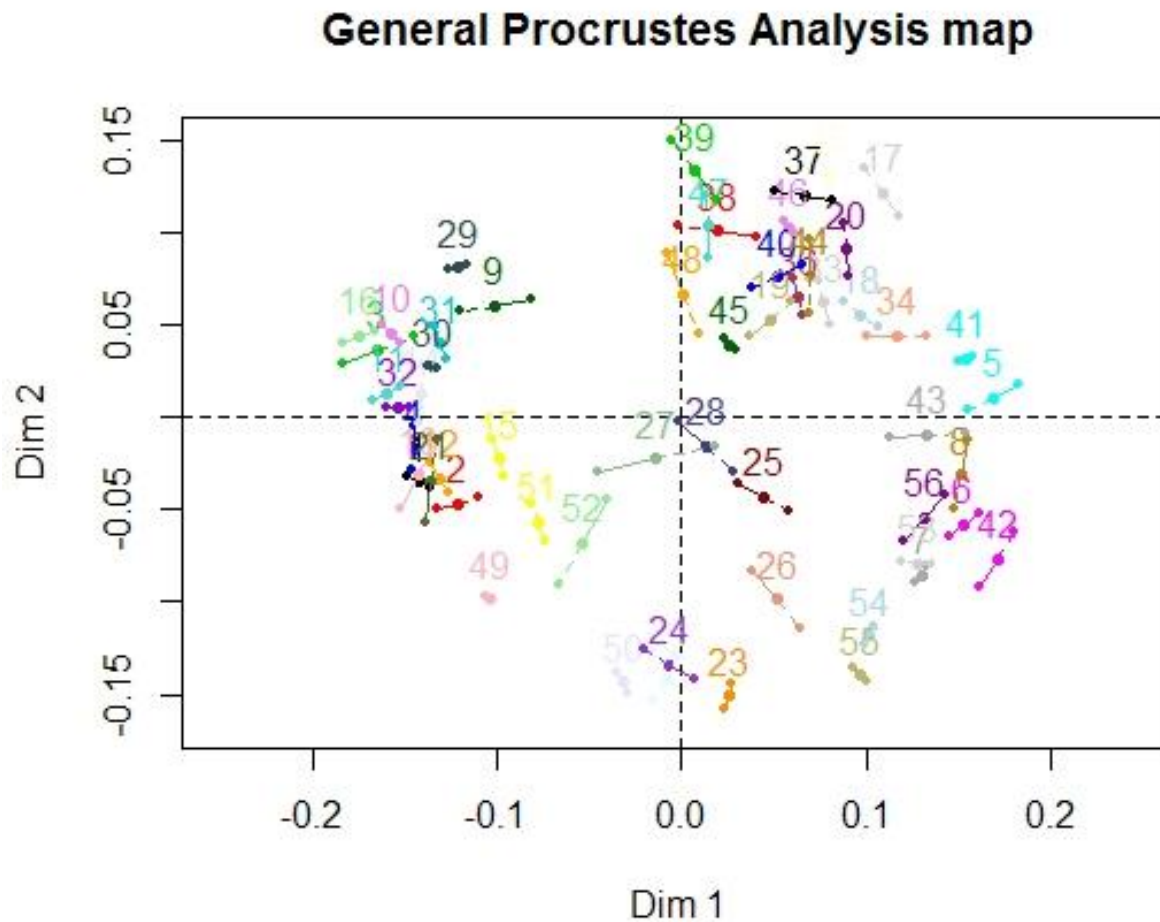
Summary

- The approach appears to have promise

- Four raters generated reasonably robust clustering of disease recovery plans

- We were able to identify a small number of variables that differentiate among disease types

- Prototype generic plans might be made from these variables and a set of others which all plans will include.

- Recommendation from wider NPDRS group to perform validation study
    - Study design by NMcR/CT
    - ***Step 1 get "gold standard" classification of existing plans by leaders of writing teams***
    - Step 2 collect set of classifications by group of other plant pathologists
    - Step 3 compare test group with gold standard using previous methodology

Gold standard classification using 37-item generic binary properties
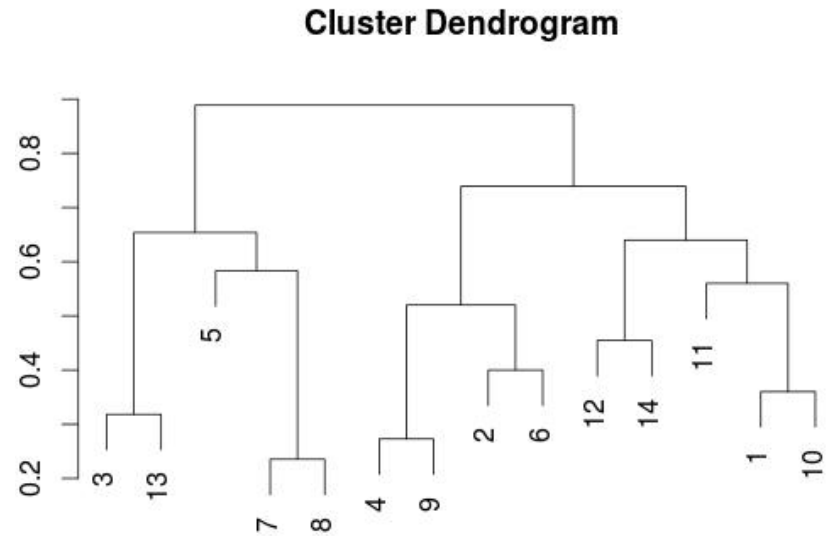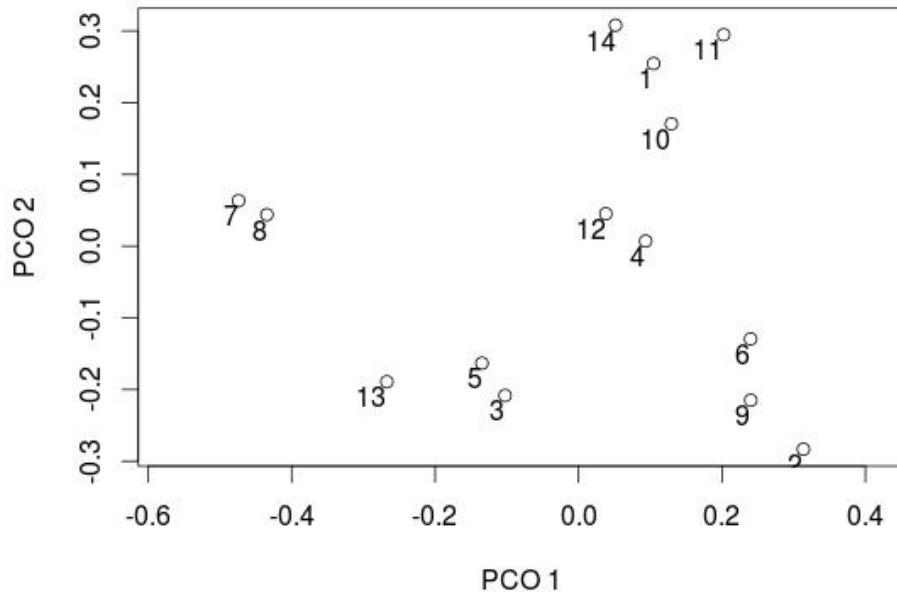
7, Laurel wilt of Avocado; **2**, Late wilt of corn; **13**, citrus variegated chlorosis; **1**, downy mildew of corn; **8**, Laurel wilt of red Bay; **3**, Huanglongbing; **4**, *Phytophthora kernoviae*; **5**, Plum Pox virus; **6**, Potato wart; **11**, Red Blotch; **10**, *Rathayibacter toxicus*; **9**, *Ralstonia solanacearum* race 3 biovar 2; **12**, Scots Pine blister rust; **14**, wheat stem rust.

Gold standard classification using 37-item generic binary properties

7, Laurel wilt of Avocado; **2**, Late wilt of corn; **13**, citrus variegated chlorosis; **1**, downy mildew of corn; **8**, Laurel wilt of red Bay; **3**, Huanglongbing; **4**, *Phytophthora kernoviae*; **5**, Plum Pox virus; **6**, Potato wart; **11**, Red Blotch; **10**, *Rathayibacter toxicus*; **9**, *Ralstonia solanacearum* race 3 biovar 2; **12**, Scots Pine blister rust; **14**, wheat stem rust.