

## Supplementary Materials

Table S1. Metabolite variability in QC composite samples

Table S2. Median concentrations (mg/g), %CV and %CV due inter-vine variation of soluble carbohydrates measured in internode, leaf and fruit of Hayward kiwifruit at three harvest times.

Table S3. Table S3. Median concentrations (mg/g), %CV and %CV due inter-vine variation of soluble carbohydrates measured in internode, leaf and fruit of Zesy002 kiwifruit at three harvest times.

Table S4. Median concentrations (ng/g), %CV and %CV due inter-vine variation of selected phytohormones measured in internode, leaf and fruit of Hayward and Zesy002 kiwifruit at three harvest times.

Figure S1. Principal Components Analysis of Psa, sampler and individual vine effects on metabolite profiles in internode, leaf and fruit tissues of 'Hayward' kiwifruit collected at three harvest times. Data are for metabolites with CV <20% in the experimental data.

Figure S2. Principal Components Analysis of Psa, sampler and individual vine effects on metabolite profiles in internode, leaf and fruit tissues of Zesy002 kiwifruit collected at three harvest times. Data are for metabolites with CV <20% in the experimental data.

Datafiles:

Hayward metabolomics data: 'HaywardmetabolomicsdataallANOVA.xlsx'.

Zesy002 metabolomics data: 'Zesy002metabolomicdataallANNOVA.xlsx'.

**Table S1.** Metabolites (mass tags) measured and percent with CV<20% (bracketed) in composite QC samples (typically n = 6) of 'Hayward' and Zesy002 kiwifruit vines.

Cultivar		'Hayward'		Zesy002		
Tissue	Internode	Mature leaf	Young leaf/fruit	Internode	Mature leaf	Young leaf/fruit
Harvest 1	392 (91)	458 (92)	503 (94)	276 (92)*	276 (92)*	276 (92)*
Harvest 2	376 (91)	450 (94)	365 (90)	362 (99)*	362 (99)*	362 (99)*
Harvest 3	615 (92)	606 (94)	448 (85)	521 (90)	629(95)	375 (83)

\* Composite sample prepared from internode, and mature and young leaf Gold3 tissue samples.

**Table S2.** Median concentrations (mg/g), %CV and %CV due inter-vine variation of soluble carbohydrates measured in internode, leaf and fruit of Hayward kiwifruit at three harvest times. Concentrations are mg/g fresh weight (FW) or mg/g dry weight (DW).

Hayward kiwifruit		Harvest 1			Harvest 2			Harvest 3			Mean	Range
		Internode	Mature leaf	Young leaf	Internode	Mature leaf	Fruit	Internode	Mature leaf	Fruit		
		DW	DW	DW	DW	DW	FW	DW	DW	FW		
<i>myo</i> -Inositol	median concentration	7.4	8.2	8.1	2.1	8.5	0.9	4.4	12.1	1.5		
	%CV of samples	22	25	35	18	26	11	27	19	12	21.7	11 - 35
	%CV due inter-vine variability	0	66	9	31	29	16	51	0	59	29.0	0 - 66
Galactinol	median concentration	1.7	2.3	2.1	0.8	2	0.1	1	2.4	0.1		
	%CV of samples	17	29	40	20	25	32	26	21	20	25.6	17 - 40
	%CV due inter-vine variability	17	10	43	8	0	7	20	4	34	15.9	0 - 43
Glucose	median concentration	20.6	20.5	11.9	0.7	2	2.8	0.2	2	2		
	%CV of samples	28	35	47	84	70	24	148	47	36	57.7	24 - 148
	%CV due inter-vine variability	0	46	0	17	1	70	1	37	28	22.2	0 - 70
Fructose	median concentration	3.4	7.5	4	0.7	3.1	0.9	0.3	2.7	0.5		
	%CV of samples	40	35	42	73	57	18	152	58	33	56.4	18 - 152
	%CV due inter-vine variability	33	44	55	19	0	35	5	70	49	34.4	0 - 70
Sucrose	median concentration	27.4	35.3	29.2	14.1	33.7	1	19.8	44.2	0.8		
	%CV of samples	14	13	24	14	19	26	20	17	17	18.2	13 - 26
	%CV due inter-vine variability	5	0	41	15	0	27	9	0	25	13.6	0 - 41
Planteose	median concentration	1.1	1.2	2	1.9	12.7	0.1	4	10.3	0.1		
	%CV of samples	22	30	27	25	25	34	27	33	59	31.3	22 - 59
	%CV due inter-vine variability	31	15	2	69	0	39	9	0	17	20.2	0 - 69

**Table S3.** Median concentrations (mg/g), %CV and %CV due inter-vine variation of soluble carbohydrates measured in internode, leaf and fruit of Zesy002 kiwifruit at three harvest times. Concentrations are mg/g fresh weight (FW) or mg/g dry weight (DW). 'nd' below LOD taken as 5 X S/N

Gold3 Kiwifruit		Harvest 1			Harvest 2			Harvest 3			Mean	Range
		internode	mature leaf	young leaf	internode	mature leaf	fruit	internode	mature leaf	fruit		
		DW	DW	DW	DW	DW	FW	DW	DW	FW		
<i>myo</i> -Inositol	median concentration	4.6	8.8	8.5	3.2	8.7	1.5	2.5	7.1	1.1		
	%CV of samples	44	17	15	26	15	35	19	19	14	22.7	14 - 44
	%CV due inter-vine variability	71	35	43	24	52	88	0	59	96	52.0	0 - 96
Galactinol	median concentration	1	1.5	1.7	0.5	2.5	0	0.6	2.5	0.1		
	%CV of samples	30	34	21	23	38	36	24	33	15	28.2	15 - 38
	%CV due inter-vine variability	67	65	0	41	80	14	0	13	39	35.4	0 - 80
Glucose	median concentration	9	19	9.9	0.3	5.7	6.6	0.3	3.2	2.7		
	%CV of samples	75	33	21	87	70	9	71	32	25	47.0	9 - 87
	%CV due inter-vine variability	19	3	28	58	0	0	51	38	54	27.9	0 - 56
Fructose	median concentration	5.6	21.9	3.5	0.5	9.5	2.9	0.5	3.8	2.4		
	%CV of samples	70	37	45	86	62	29	70	45	24	52.0	24 - 86
	%CV due inter-vine variability	4	67	19	72	0	62	0	30	54	34.2	0 - 72
Sucrose	median concentration	56.9	63.7	19.1	20.5	37.2	0.8	11.9	27	1		
	%CV of samples	15	26	15	18	21	74	13	20	12	23.8	12 - 74
	%CV due inter-vine variability	44	72	0	45	53	91	0	34	65	44.9	0 - 91
Planteose	median concentration	nd	9	0.7	2.7	16.8	nd	4.3	10.2	0.1		
	%CV of samples		53	93	32	38		25	43	18	43.1	18 - 93
	%CV due inter-vine variability		6	0	60	4		39	0	0	15.6	0 - 60

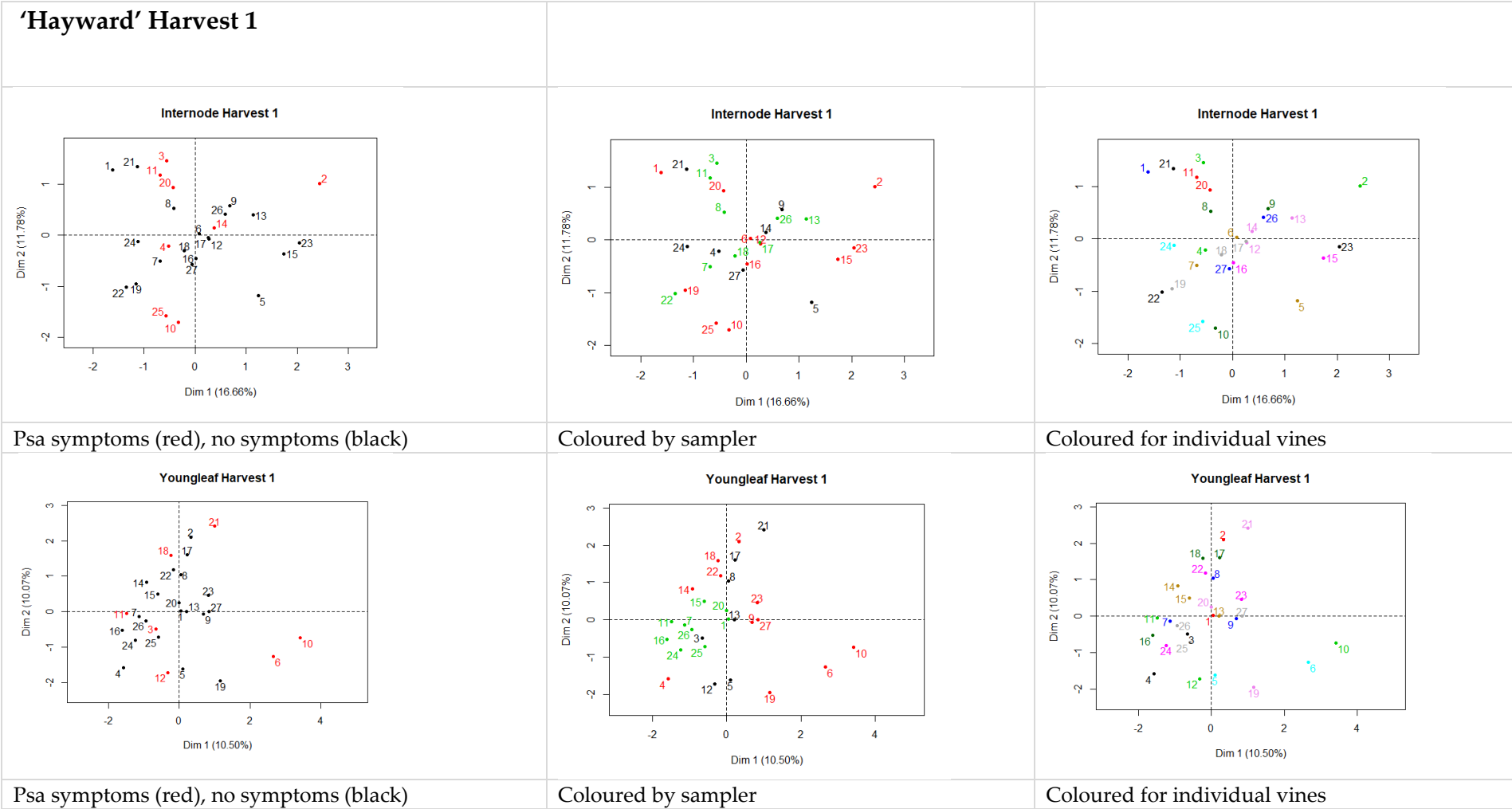
**Table S4.** Median concentrations (ng/g), analytical %CV calculated from technical replicates and %CV due inter-vine variation of selected phytohormones measured in internode, leaf and fruit of Hayward and Zesy002 kiwifruit at three harvest times. Concentrations are expressed as either ng/g fresh weight (FW) or ng/g dry weight (DW). ‘nd’ samples are below LOD taken as 5 X S/N. GA1, GA4 gibberellins 1 and 4, 2iP N6-isopentyladenine, 2iPR N6-isopentyladenosine, tZ *trans*-zeatin, tZR *trans*-zeatin riboside, SA salicylic acid, ABA abscisic acid, JA jasmonic acid. Quantitation against deuterated internal standards using targeted LC-MS/MS.

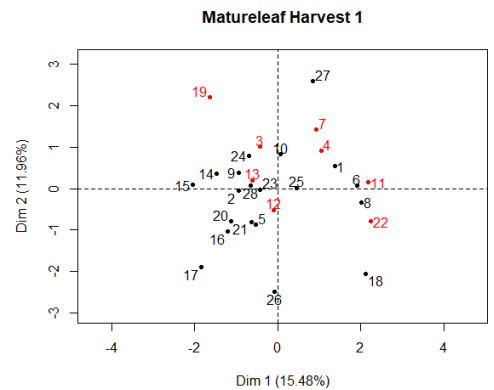
[illegible]

<b>tZ</b>	<b>median concentration</b>	<b>1.6</b>	<b>2.6</b>	<b>nd</b>	<b>nd</b>	<b>2.7</b>	<b>3.0</b>	<b>0.1</b>	<b>1.1</b>	<b>0.3</b>
	analytical CV (%)	3.6	7.1	-	-	14.3	4.30	8.37	-	15.1
	%CV samples	24	104	-	-	97	48	131	36	38
	% CV due inter-vine variability	48	41	-	-	69	84	14	63	63
<b>tZR</b>	<b>median concentration</b>	<b>8.4</b>	<b>40</b>	<b>1.3</b>	<b>nd</b>	<b>12.1</b>	<b>28.0</b>	<b>1.8</b>	<b>20.0</b>	<b>6.3</b>
	analytical CV (%)	1.7	4.7	6.7	-	2.3	1.8	6.3	5.0	7.0
	%CV samples	27	54	35	-	24	44	51	58	46
	% CV due inter-vine variability	58	0	72	0	32	42	26	25	77
<b>SA</b>	<b>median concentration</b>	<b>2750</b>	<b>1255</b>	<b>117</b>	<b>38</b>	<b>710</b>	<b>240</b>	<b>18</b>	<b>80</b>	<b>19</b>
	analytical CV (%)	16	1.8	15	8	5.9	1.5	7.9	4.9	7.8
	%CV samples	33	29	67	57	28	27	11	15	23
	% CV due inter-vine variability	47	9	36	10	18	67	0	52	-
<b>ABA</b>	<b>median concentration</b>	<b>1197</b>	<b>1380</b>	<b>32</b>	<b>38</b>	<b>298</b>	<b>358</b>	<b>93</b>	<b>339</b>	<b>33</b>
	analytical CV (%)	2	2.8	3.4	0.9	5.5	2.1	3.1	1.6	3.4
	%CV samples	10	26	22	42	21	31	79	47	35
	% CV due inter-vine variability	10	33	41	94	0	11	93	65	67
<b>JA</b>	<b>median concentration</b>	<b>189</b>	<b>140</b>	<b>72</b>	<b>5.2</b>	<b>282</b>	<b>41</b>	<b>16</b>	<b>19</b>	<b>8.2</b>
	analytical CV (%)	1.3	17	10	3.7	7.4	10.7	6.1	2.8	6.6
	%CV samples	84	92	56	46	50	85	43	75	57
	% CV due inter-vine variability	1	0	28	0	54	93	11	0	31

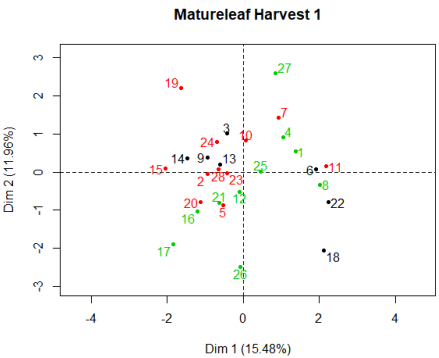
\* Insufficient duplicate or triplicate samples to calculate analytical CV.

**Figure S1.** Principal Components Analysis of Psa, sampler and individual vine effects on metabolite profiles in internode, leaf and fruit tissues of ‘Hayward’ kiwifruit collected at three harvest times. Data are for metabolites with CV <20% in the experimental data.

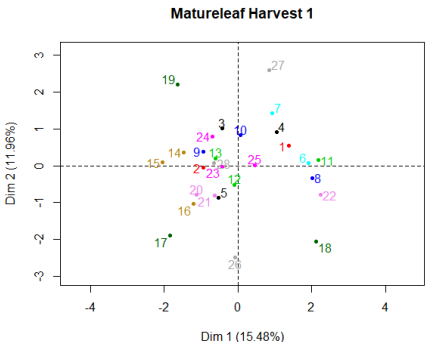




Psa symptoms (red), no symptoms (black)

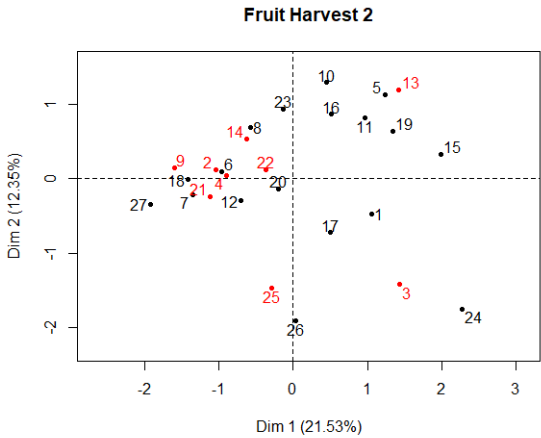


Coloured by sampler

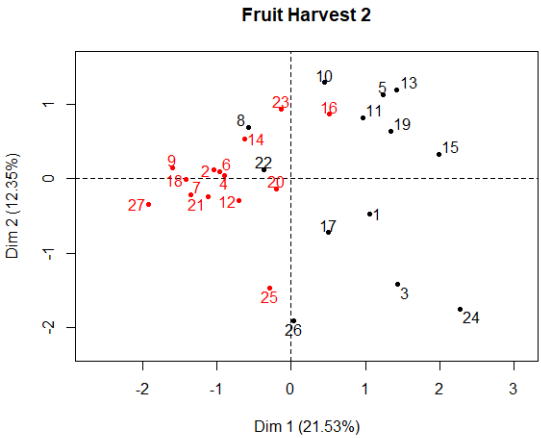


Coloured for individual vines

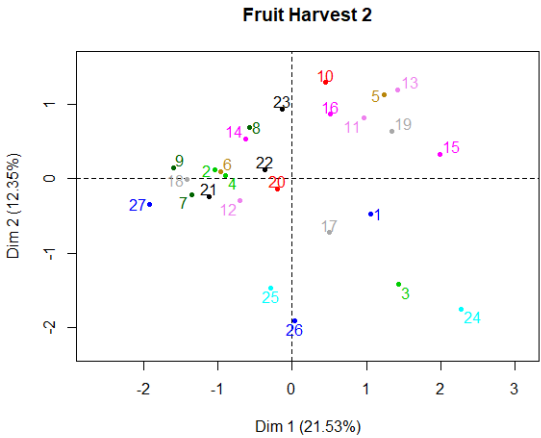
## 'Hayward' Harvest 2



Psa symptoms (red), no symptoms (black)

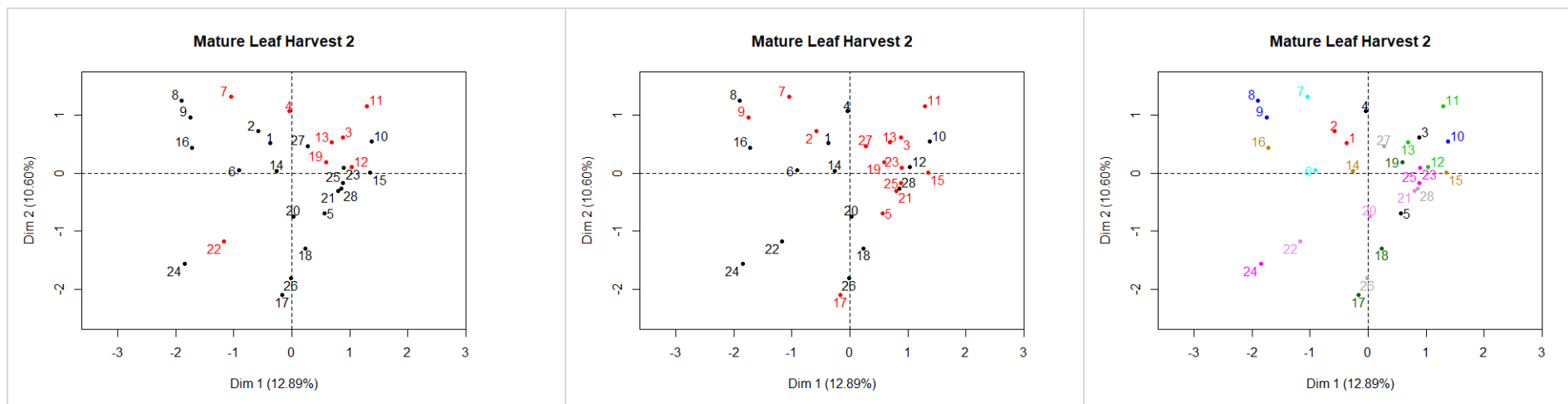
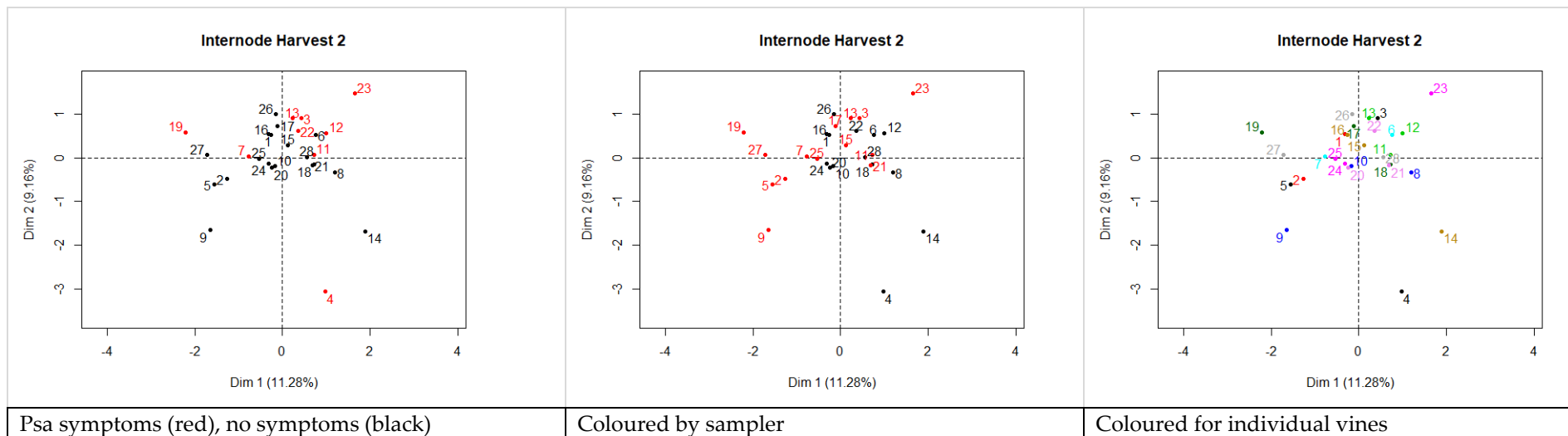


Coloured by sampler



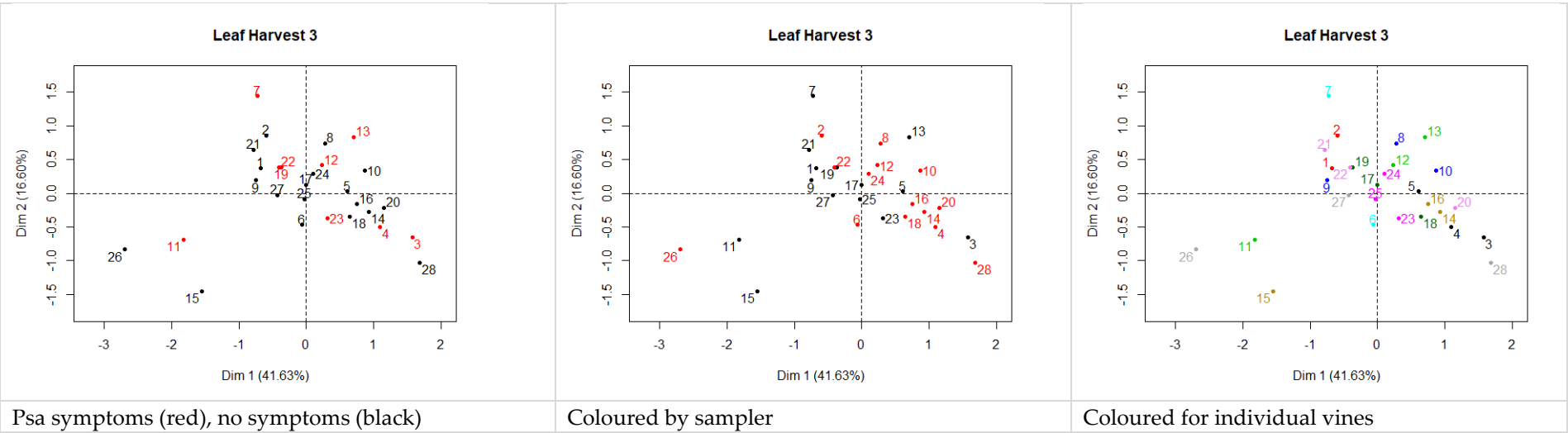
Coloured for individual vines

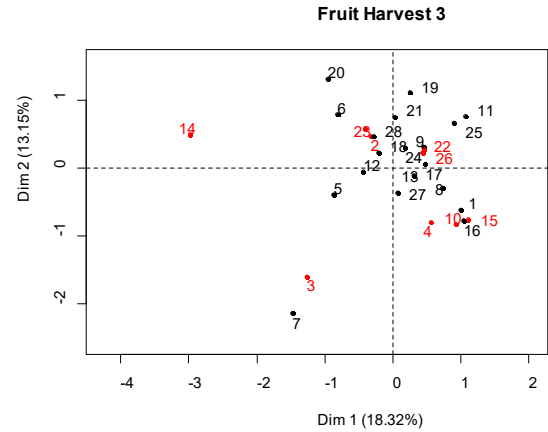




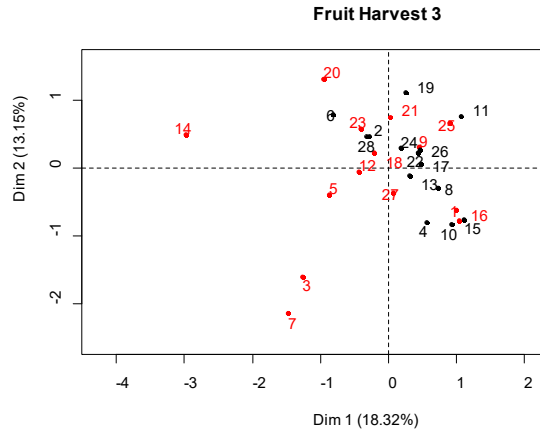
Psa symptoms (red), no symptoms (black)	Coloured by sampler	Coloured for individual vines
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'Hayward' Harvest 3

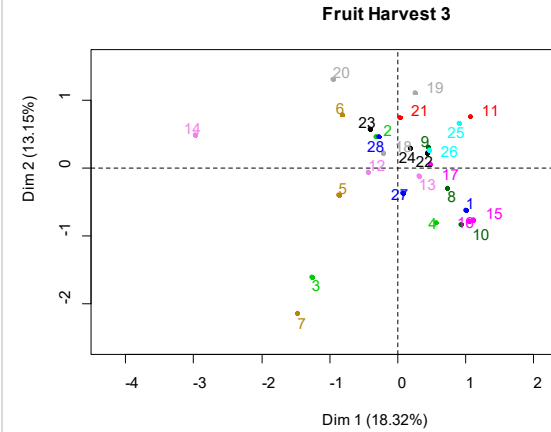




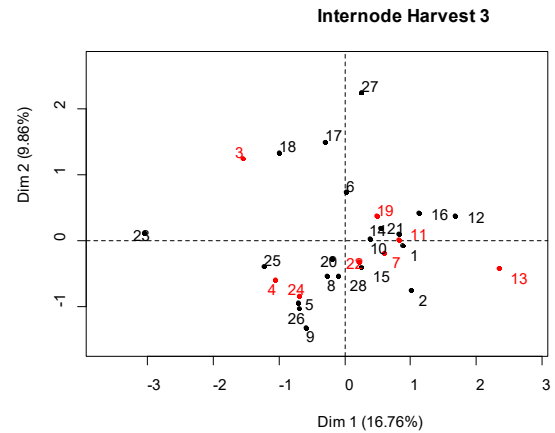
Psa symptoms (red), no symptoms (black)



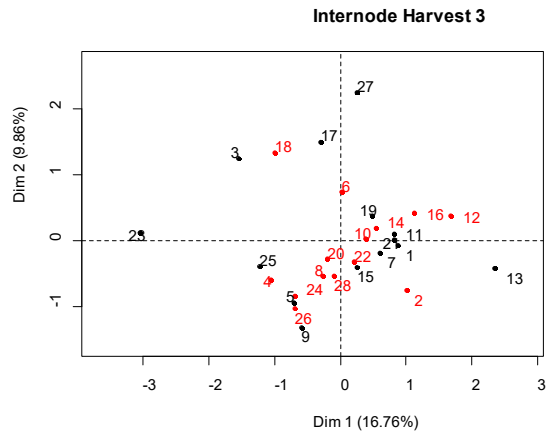
Coloured by sampler



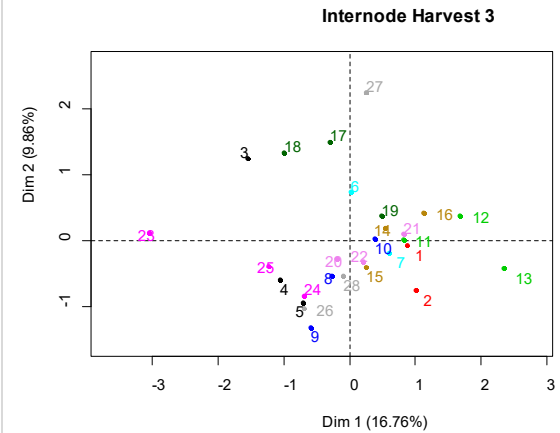
Coloured for individual vines



Psa symptoms (red), no symptoms (black)

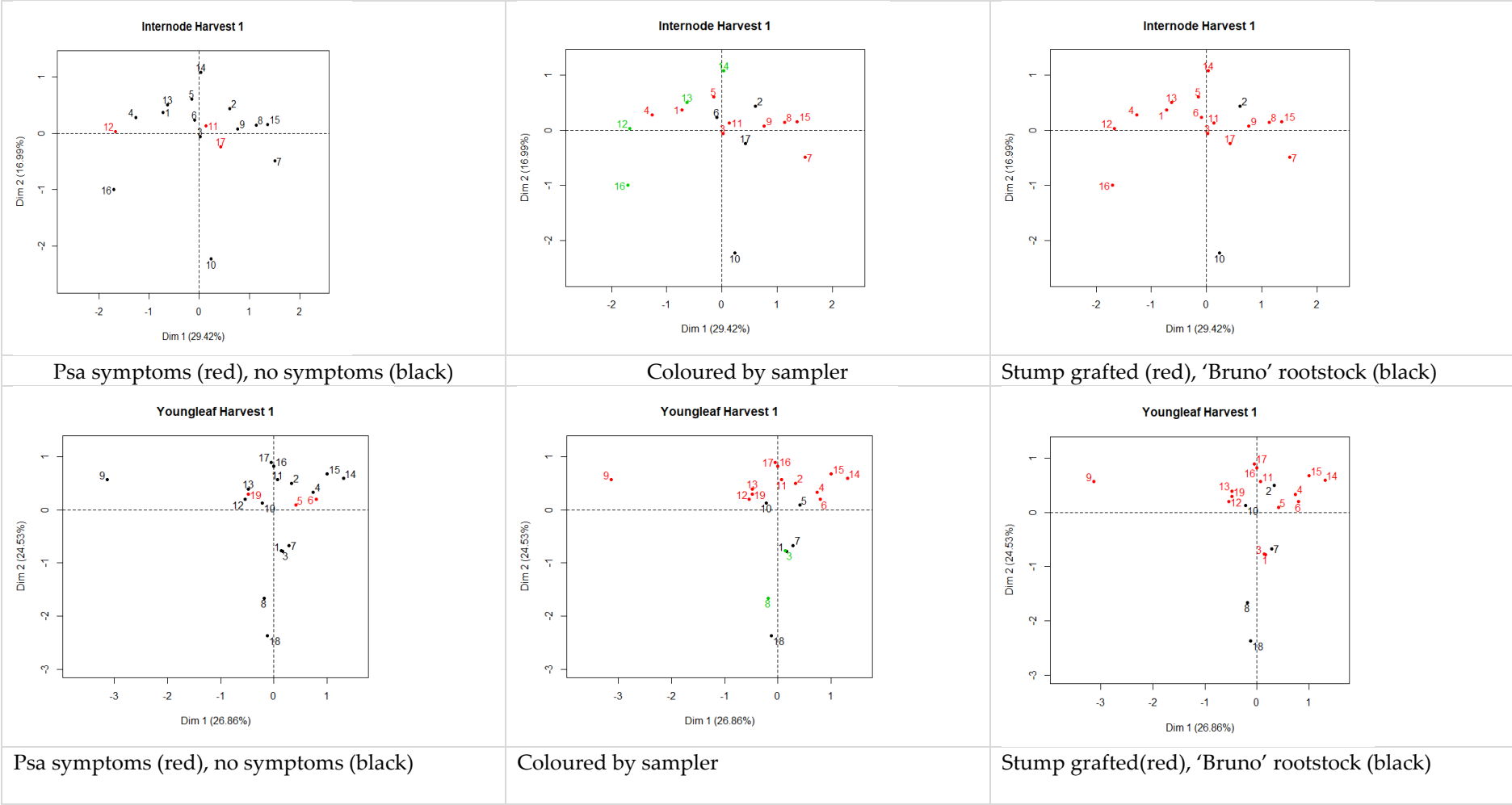


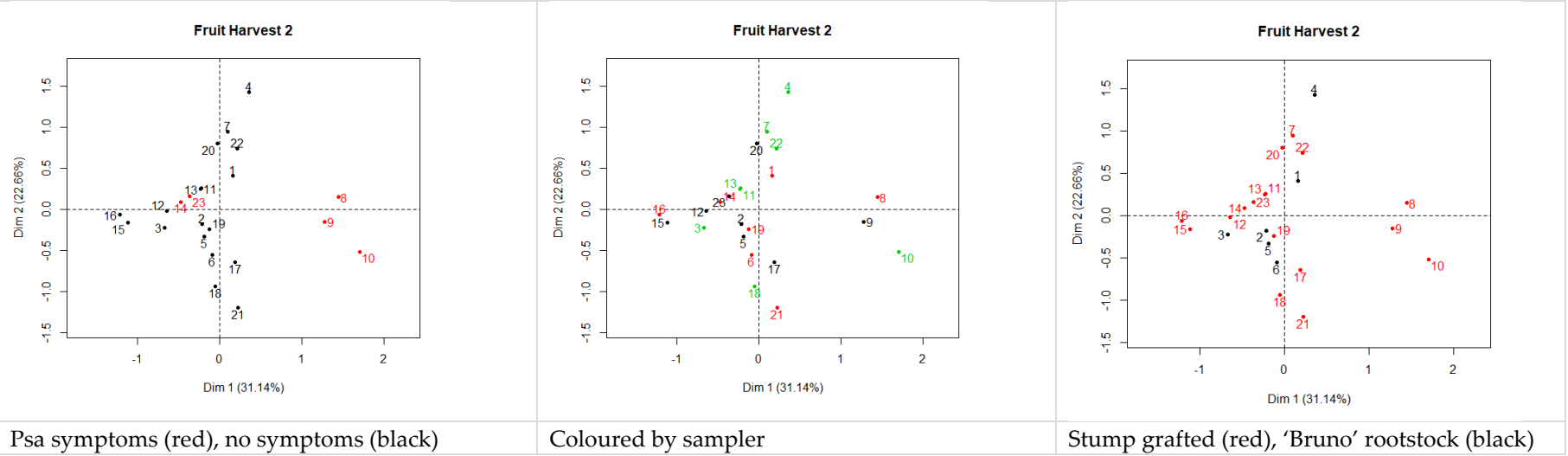
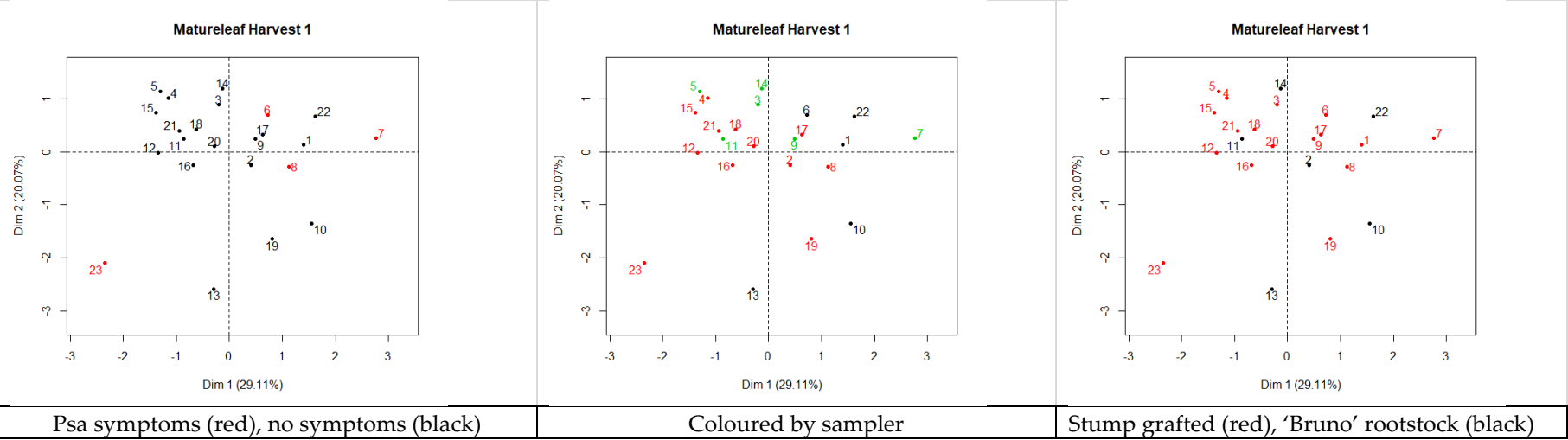
Coloured by sampler

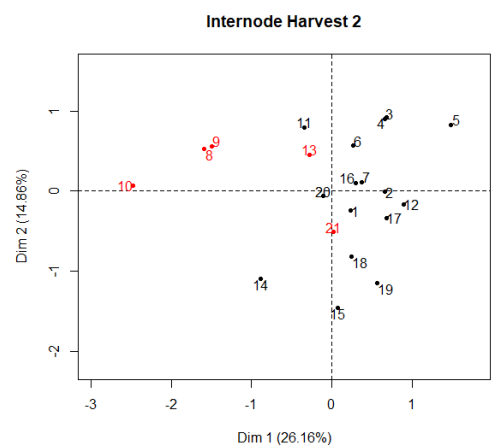


Coloured for individual vines

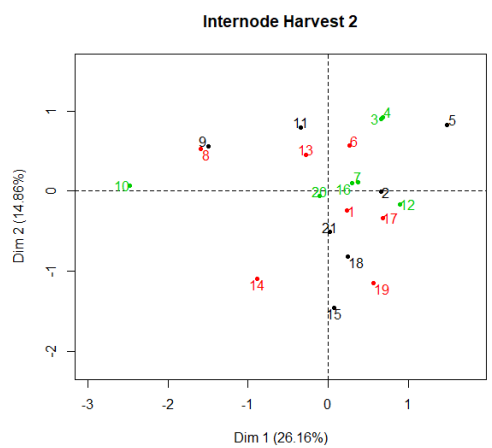
**Figure S2.** Principal Components Analysis of Psa, sampler and individual vine effects on metabolite profiles in internode, leaf and fruit tissues of Zesy002 kiwifruit collected at three harvest times. Data are for metabolites with CV <20% in the experimental data.



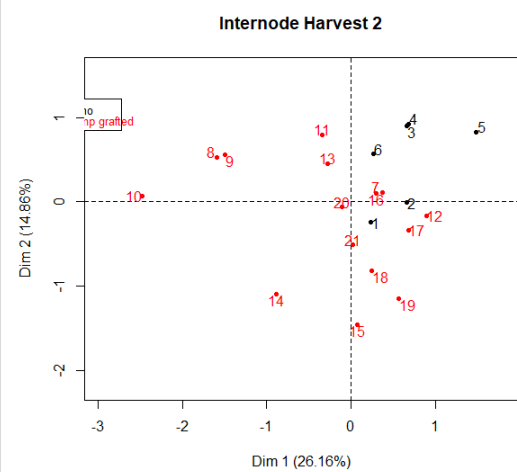




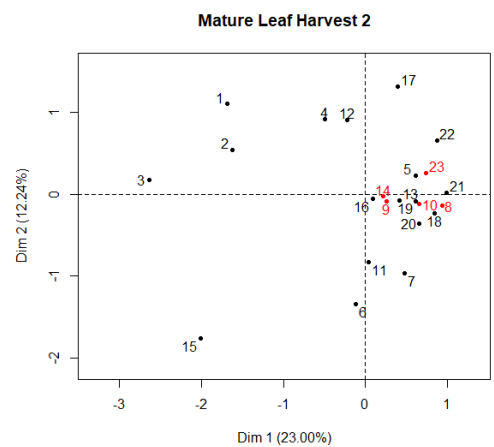
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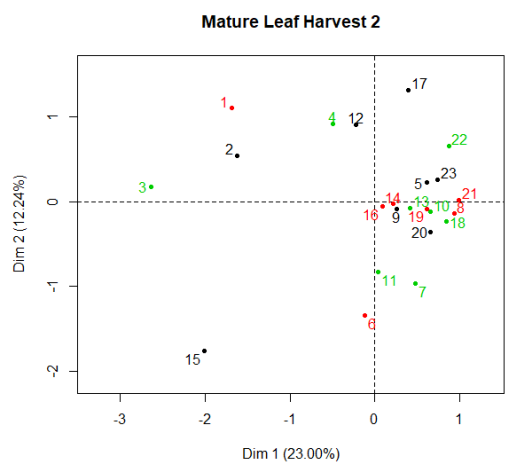
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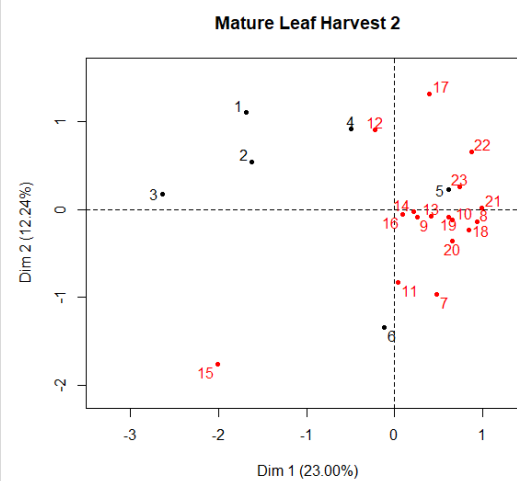
Stump grafted (red), 'Bruno' rootstock (black)



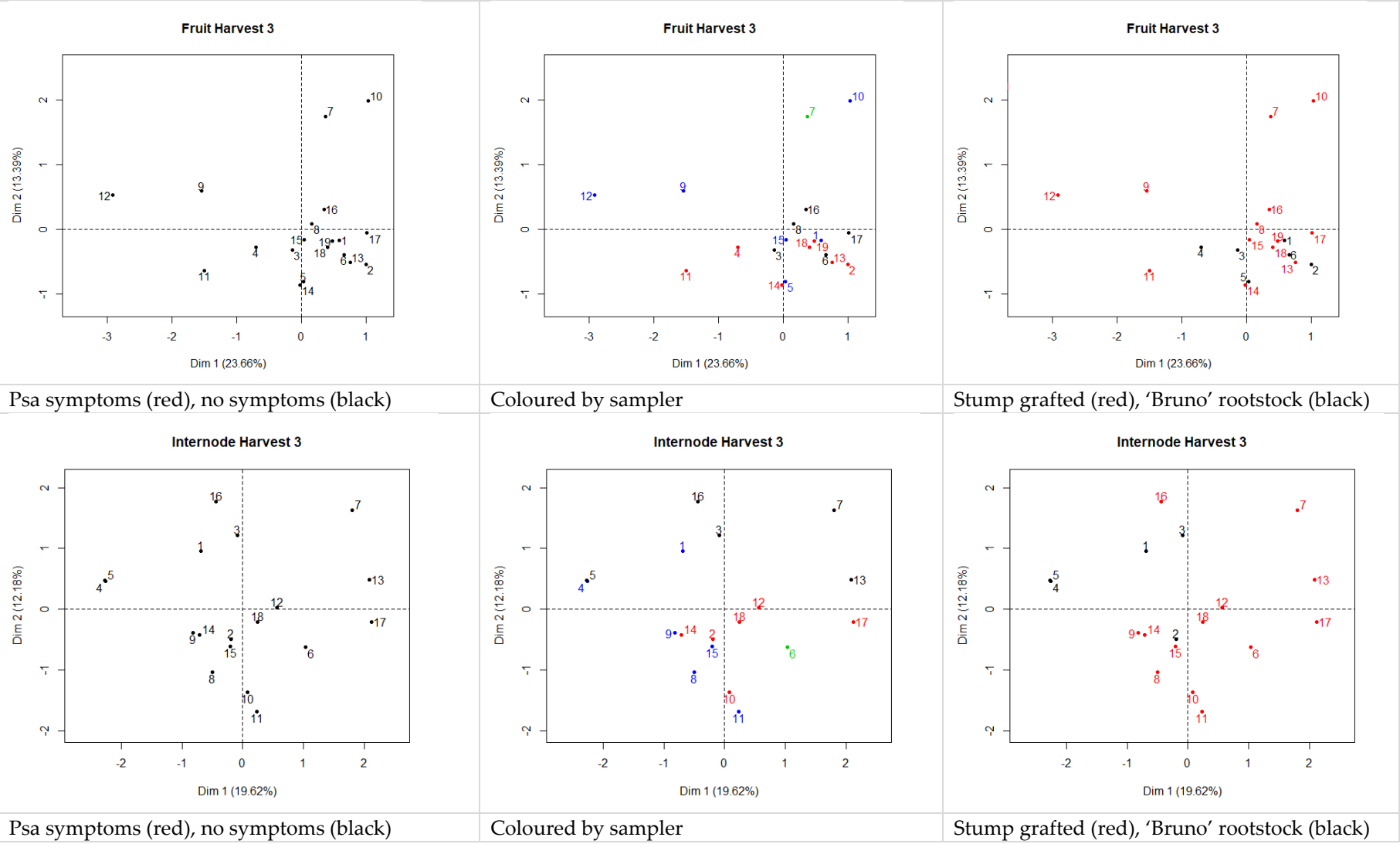
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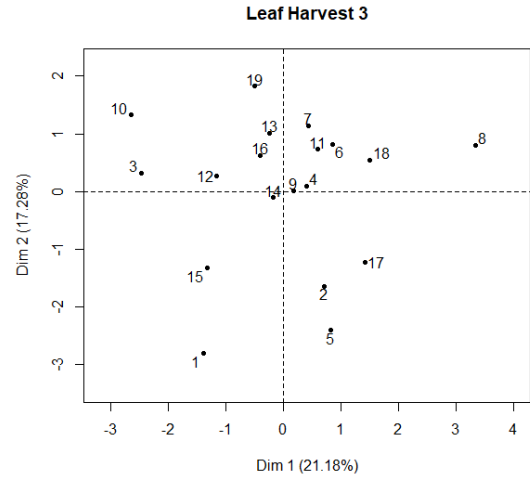


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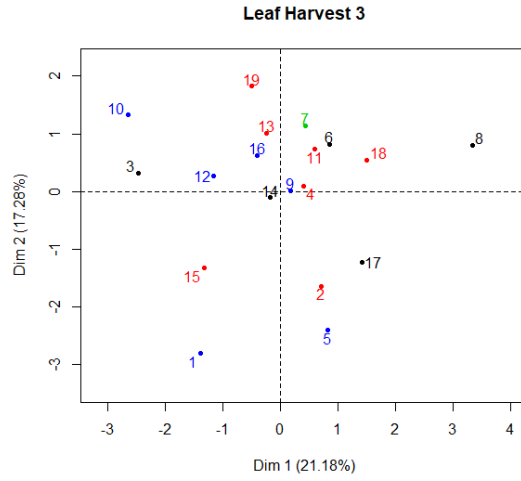


Stump grafted (red), 'Bruno' rootstock (black)

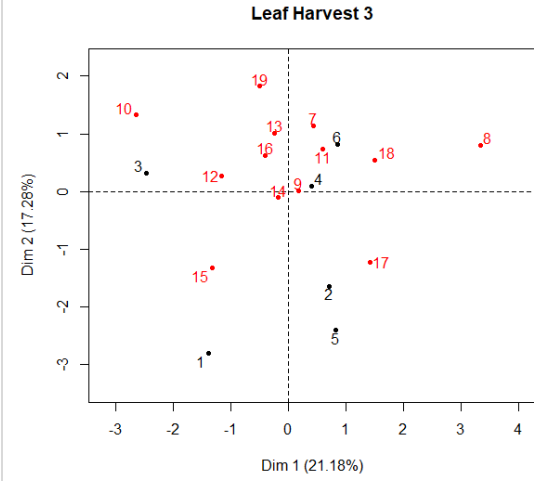




Psa symptoms (red), no symptoms (black)



Coloured by sampler



Stump grafted (red), 'Bruno' rootstock (black)