APPENDICES

APPENDIX A1

Label claim of Green Queen cultivar (เมล็ดพันธุ์ตรากรีนควีน)

Lable Claim	:	Lot No.	-
		Purity:	> 98%
		Germ:	> 80%
		Test Date:	7/2002
		Exp. Date:	10/2004
		Place Packaged:	Pratumthani
Pack Size	:	20 g tread pack	
Company	:	Seen Seeds Marketing Co., Ltd.	
		355/177-178 Talad Simummuang, KooKot,	
		Lumlukka, Pratumthani 12130, Thailand	
		Tel. (662) 531-7794	
		Fax. (662) 531-7795	

APPENDIX A2

Label claim of Packman cultivar (เมล็ดพันธุ์ตราแพคแมน)

Lable Claim	:	Lot No.	-
		Purity:	> 98%
		Germ:	> 98%
		Test Date:	04/2003
		Exp. Date:	09/2005
		Place Packaged:	Bangkok
Pack Size	:	20 g tread pack	
Company	:	Seminis Vegetable Seeds (Thailand) Ltd.	
		341 M. 4 T. Ban-ped A. Maung ,	
		Khon Khan 40000, Thailand	
		Tel. (661) 846-9190	
		Fax. -	

APPENDIX A3

Label claim of Pak Ging cultivar (เมล็ดพันธุ์ตราปักกิ่ง)

Lable Claim	:	Lot No.	775
		Purity:	> 98%
		Germ:	> 85%
		Test Date:	9/2001
		Exp. Date:	12/2003
		Place Packaged:	-
Pack Size	:	20 g tread pack	
Company	:	Hi-Q Agricultural Co., Ltd.	
		52/111-112 Praram Road 2, Bankuntean	
		Bangkok 10150, Thailand	
		Tel. (662) 428-0756	
		Fax. -	

APPENDIX A4

Label claim of Rod Fai cultivar (เมล็ดพันธุ์ตารถไฟ)

Lable Claim	:	Lot No.	-
		Purity:	> 98%
		Germ:	> 85%
		Test Date:	7/44
		Exp. Date:	1/47
		Place Packaged:	Bangkok
Pack Size	:	100 g tread pack	
Company	:	ห้างพืชพันธุ์เตี๋ยเซ้งเฮงฮวด	
		64 ถ.จักรเพชร ปากคลองตลาด กรุงเทพฯ	
		Tel. (662) 221-7524, 223-7636	
		Fax. -	

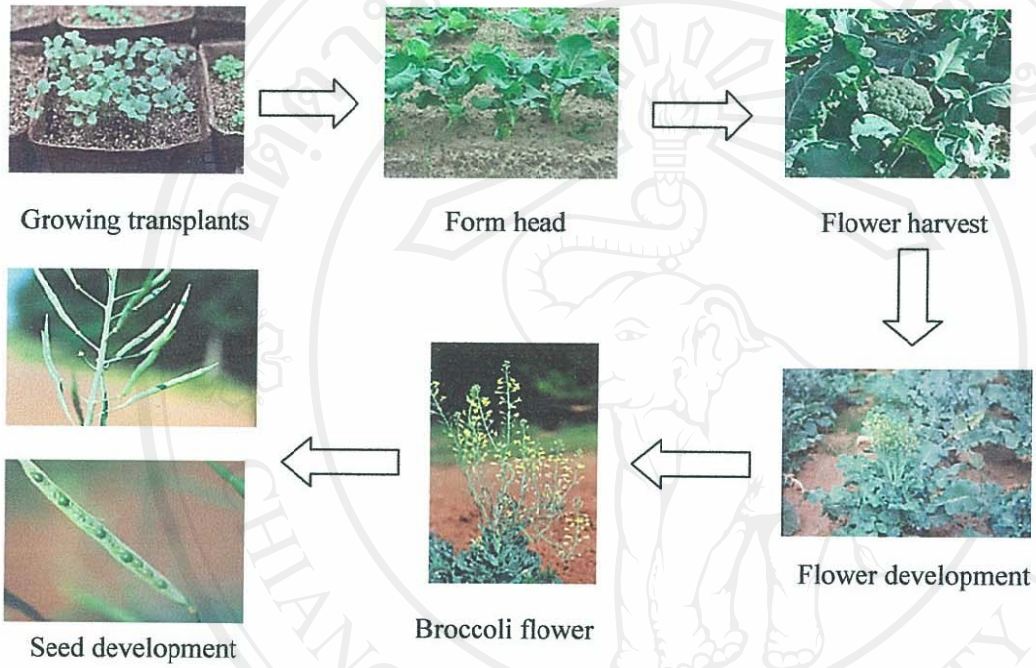
APPENDIX A5

Label claim of Top Green # 067 cultivar (เมล็ดพันธุ์ตราท๊อปกรีน)

Lable Claim	:	Lot No.	54021-540420
		Purity:	> 98%
		Germ:	> 75%
		Test Date:	4/45
		Exp. Date:	5/47
		Place Packaged:	Aom-noi
Pack Size	:	20 g tread pack	
Company	:	CHIA TAI CO., LTD	
		299-301 Songsawad Road, Bangkok 10100, Thailand	
		Tel. (662) 233-8191-9	
		Fax. (662) 237-1540	
		e-mail: seed@chiataigroup.com	

APPENDIX B

Broccoli seeds production



APPENDIX C

The percentages of moisture and dry matter data for each cultivar.

Cultivars	No.	initial wt (g)	finish wt (g)	loss (g)	%Moisture	%Dry matter
Green Queen	1	1.222	1.174	0.048	3.93	96.07
	2	1.086	1.042	0.044	4.05	95.95
	3	1.235	1.187	0.048	3.89	96.11
	mean	1.181	1.134	0.047	**3.96**	**96.04**
	SD	0.083	0.080	0.002	**0.09**	**0.09**
Packman	1	1.312	1.284	0.028	2.13	97.87
	2	1.214	1.188	0.026	2.14	97.86
	3	1.258	1.233	0.025	1.99	98.01
	mean	1.261	1.235	0.026	**2.09**	**97.91**
	SD	0.049	0.048	0.002	**0.09**	**0.09**
Pak Ging	1	1.308	1.284	0.024	1.83	98.17
	2	1.205	1.183	0.022	1.83	98.17
	3	1.219	1.197	0.022	1.80	98.20
	mean	1.244	1.221	0.023	**1.82**	**98.18**
	SD	0.056	0.055	0.001	**0.02**	**0.02**
Rod Fai	1	1.241	1.210	0.031	2.50	97.50
	2	1.305	1.274	0.031	2.38	97.62
	3	1.312	1.281	0.031	2.36	97.64
	mean	1.286	1.255	0.031	**2.41**	**97.59**
	SD	0.039	0.039	0.000	**0.07**	**0.07**
Top Green#067	1	1.309	1.287	0.022	1.68	98.32
	2	1.293	1.271	0.022	1.70	98.30
	3	1.297	1.274	0.023	1.77	98.23
	mean	1.300	1.277	0.022	**1.72**	**98.28**
	SD	0.008	0.009	0.001	**0.05**	**0.05**

APPENDIX D 1

Results of the statistical analysis of the percentages of moisture (1), dry matter (2), ash (3) and fat (4) data for Green Queen cultivar.

Descriptives

Experimental Data

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	3.9557	8.591E-02	4.960E-02	3.7423	4.1691	3.89	4.05
2	3	96.0443	8.591E-02	4.960E-02	95.8309	96.2577	95.95	96.11
3	3	3.0467	.1274	7.356E-02	2.7302	3.3632	2.90	3.13
4	3	26.6900	1.1632	.6716	23.8004	29.5796	25.48	27.80
Total	12	32.4342	39.6169	11.4364	7.2628	57.6055	2.90	96.11

Test of Homogeneity of Variances

Experimental Data

Levene Statistic	df1	df2	Sig.
4.215	3	8	.046

ANOVA

Experimental Data

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17261.70	3	5753.899	16628.64	.000
Within Groups	2.768	8	.346		
Total	17264.46	11			

Multiple Comparisons

Dependent Variable: Experimental Data

LSD

(I) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude F	(J) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude F	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-92.0887*	.4803	.000	-93.1962	-90.9811
	3	.9090	.4803	.095	-.1986	2.0166
	4	-22.7343*	.4803	.000	-23.8419	-21.6268
2	1	92.0887*	.4803	.000	90.9811	93.1962
	3	92.9977*	.4803	.000	91.8901	94.1052
	4	69.3543*	.4803	.000	68.2468	70.4619
3	1	-.9090	.4803	.095	-2.0166	.1986
	2	-92.9977*	.4803	.000	-94.1052	-91.8901
	4	-23.6433*	.4803	.000	-24.7509	-22.5358
4	1	22.7343*	.4803	.000	21.6268	23.8419
	2	-69.3543*	.4803	.000	-70.4619	-68.2468
	3	23.6433*	.4803	.000	22.5358	24.7509

*. The mean difference is significant at the .05 level.

APPENDIX D 2

Results of the statistical analysis of the percentages of moisture (1), dry matter (2), ash (3) and fat (4) data for Packman cultivar.

Descriptives

Experimental Data

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	2.0877	8.727E-02	5.039E-02	1.8709	2.3045	1.99	2.14
2	3	97.9123	8.727E-02	5.039E-02	97.6955	98.1291	97.86	98.01
3	3	1.7867	.1168	6.741E-02	1.4966	2.0767	1.66	1.89
4	3	27.4667	1.3269	.7661	24.1706	30.7627	26.32	28.92
Total	12	32.3133	41.0323	11.8450	6.2427	58.3840	1.66	98.01

Test of Homogeneity of Variances

Experimental Data

Levene Statistic	df1	df2	Sig.
6.747	3	8	.014

ANOVA

Experimental Data

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18516.56	3	6172.187	13797.23	.000
Within Groups	3.579	8	.447		
Total	18520.14	11			

Multiple Comparisons

Dependent Variable: Experimental Data

LSD

(I) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude Fat	(J) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude Fat	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-96.3600*	.6542	.000	-97.8685	-94.8515
	3	-3.6667E-02	.6542	.957	-1.5452	1.4718
	4	-25.7633*	.6542	.000	-27.2718	-24.2548
2	1	96.3600*	.6542	.000	94.8515	97.8685
	3	96.3233*	.6542	.000	94.8148	97.8318
	4	70.5967*	.6542	.000	69.0882	72.1052
3	1	3.667E-02	.6542	.957	-1.4718	1.5452
	2	-96.3233*	.6542	.000	-97.8318	-94.8148
	4	-25.7267*	.6542	.000	-27.2352	-24.2182
4	1	25.7633*	.6542	.000	24.2548	27.2718
	2	-70.5967*	.6542	.000	-72.1052	-69.0882
	3	25.7267*	.6542	.000	24.2182	27.2352

*. The mean difference is significant at the .05 level.

APPENDIX D 3

Results of the statistical analysis of the percentages of moisture (1), dry matter (2), ash (3) and fat (4) data for Pak Ging cultivar.

Descriptives

Experimental Data

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	1.8200	1.732E-02	1.000E-02	1.7770	1.8630	1.80	1.83
2	3	98.1800	1.732E-02	1.000E-02	98.1370	98.2230	98.17	98.20
3	3	1.8567	.8693	.5019	-.3029	4.0162	1.07	2.79
4	3	27.5833	1.3458	.7770	24.2401	30.9265	26.03	28.40
Total	12	32.3600	41.1868	11.8896	6.1912	58.5288	1.07	98.20

Test of Homogeneity of Variances

Experimental Data

Levene Statistic	df1	df2	Sig.
7.948	3	8	.009

ANOVA

Experimental Data

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18654.70	3	6218.234	9687.357	.000
Within Groups	5.135	8	.642		
Total	18659.84	11			

Multiple Comparisons

Dependent Variable: Experimental Data

LSD

(I) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude	(J) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-95.8247*	.5461	.000	-97.0840	-94.5653
	3	.3010	.5461	.597	-.9583	1.5603
	4	-25.3790*	.5461	.000	-26.6383	-24.1197
2	1	95.8247*	.5461	.000	94.5653	97.0840
	3	96.1257*	.5461	.000	94.8663	97.3850
	4	70.4457*	.5461	.000	69.1863	71.7050
3	1	-.3010	.5461	.597	-1.5603	.9583
	2	-96.1257*	.5461	.000	-97.3850	-94.8663
	4	-25.6800*	.5461	.000	-26.9393	-24.4207
4	1	25.3790*	.5461	.000	24.1197	26.6383
	2	-70.4457*	.5461	.000	-71.7050	-69.1863
	3	25.6800*	.5461	.000	24.4207	26.9393

*. The mean difference is significant at the .05 level.

APPENDIX D 4

Results of the statistical analysis of the percentages of moisture (1), dry matter (2), ash (3) and fat (4) data for Rod Fai cultivar.

Descriptives

Experimental Data

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	2.4133	7.572E-02	4.372E-02	2.2252	2.6014	2.36	2.50
2	3	97.5867	7.572E-02	4.372E-02	97.3986	97.7748	97.50	97.64
3	3	1.7733	.2715	.1568	1.0988	2.4479	1.52	2.06
4	3	25.8967	.9555	.5517	23.5230	28.2703	25.34	27.00
Total	12	31.9175	40.8829	11.8019	5.9417	57.8933	1.52	97.64

Test of Homogeneity of Variances

Experimental Data

Levene Statistic	df1	df2	Sig.
10.263	3	8	.004

ANOVA

Experimental Data

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18383.57	3	6127.857	24554.81	.000
Within Groups	1.996	8	.250		
Total	18385.57	11			

Multiple Comparisons

Dependent Variable: Experimental Data

LSD

(I) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude Fa	(J) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude Fa	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-95.1733*	.4079	.000	-96.1139	-94.2327
	3	.6400	.4079	.155	-.3006	1.5806
	4	-23.4833*	.4079	.000	-24.4239	-22.5427
2	1	95.1733*	.4079	.000	94.2327	96.1139
	3	95.8133*	.4079	.000	94.8727	96.7539
	4	71.6900*	.4079	.000	70.7494	72.6306
3	1	-.6400	.4079	.155	-1.5806	.3006
	2	-95.8133*	.4079	.000	-96.7539	-94.8727
	4	-24.1233*	.4079	.000	-25.0639	-23.1827
4	1	23.4833*	.4079	.000	22.5427	24.4239
	2	-71.6900*	.4079	.000	-72.6306	-70.7494
	3	24.1233*	.4079	.000	23.1827	25.0639

*. The mean difference is significant at the .05 level.

APPENDIX D 5

Results of the statistical analysis of the percentages of moisture (1), dry matter (2), ash (3) and fat (4) data for Top Green #067 cultivar.

Descriptives

Experimental Data

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	1.7167	4.726E-02	2.728E-02	1.5993	1.8341	1.68	1.77
2	3	98.2833	4.726E-02	2.728E-02	98.1659	98.4007	98.23	98.32
3	3	1.4600	.1114	6.429E-02	1.1834	1.7366	1.36	1.58
4	3	26.1233	1.1675	.6741	23.2231	29.0235	24.87	27.18
Total	12	31.8958	41.3807	11.9456	5.6038	58.1879	1.36	98.32

Test of Homogeneity of Variances

Experimental Data

Levene Statistic	df1	df2	Sig.
5.809	3	8	.021

ANOVA

Experimental Data

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18833.23	3	6277.744	18197.68	.000
Within Groups	2.760	8	.345		
Total	18835.99	11			

Multiple Comparisons

Dependent Variable: Experimental Data

LSD

(I) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude Fa	(J) 1=%Moisture, 2=%Dry matter, 3=%Ash, 4=%Crude Fa	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-96.5667*	.4796	.000	-97.6725	-95.4608
	3	.2567	.4796	.607	-.8492	1.3625
	4	-24.4067*	.4796	.000	-25.5125	-23.3008
2	1	96.5667*	.4796	.000	95.4608	97.6725
	3	96.8233*	.4796	.000	95.7175	97.9292
	4	72.1600*	.4796	.000	71.0541	73.2659
3	1	-.2567	.4796	.607	-1.3625	.8492
	2	-96.8233*	.4796	.000	-97.9292	-95.7175
	4	-24.6633*	.4796	.000	-25.7692	-23.5575
4	1	24.4067*	.4796	.000	23.3008	25.5125
	2	-72.1600*	.4796	.000	-73.2659	-71.0541
	3	24.6633*	.4796	.000	23.5575	25.7692

*. The mean difference is significant at the .05 level.

APPENDIX D 6

Results of the statistical analysis of the percentages of moisture data for all cultivars.

ANOVA

% moisture

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.963	4	2.491	535.365	.000
Within Groups	4.653E-02	10	4.653E-03		
Total	10.010	14			

Multiple Comparisons

Dependent Variable: % moisture

LSD

(I) 1=GQ,2=Pm,3=PK,4=RF,5=TG	(J) 1=GQ,2=Pm,3=PK,4=RF,5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	1.8680*	5.569E-02	.000	1.7439	1.9921
	3	2.1357*	5.569E-02	.000	2.0116	2.2598
	4	1.5423*	5.569E-02	.000	1.4182	1.6664
	5	2.2390*	5.569E-02	.000	2.1149	2.3631
2	1	-1.8680*	5.569E-02	.000	-1.9921	-1.7439
	3	.2677*	5.569E-02	.001	.1436	.3918
	4	-.3257*	5.569E-02	.000	-.4498	-.2016
	5	.3710*	5.569E-02	.000	.2469	.4951
3	1	-2.1357*	5.569E-02	.000	-2.2598	-2.0116
	2	-.2677*	5.569E-02	.001	-.3918	-.1436
	4	-.5933*	5.569E-02	.000	-.7174	-.4692
	5	.1033	5.569E-02	.093	-2.0760E-02	.2274
4	1	-1.5423*	5.569E-02	.000	-1.6664	-1.4182
	2	.3257*	5.569E-02	.000	.2016	.4498
	3	.5933*	5.569E-02	.000	.4692	.7174
	5	.6967*	5.569E-02	.000	.5726	.8208
5	1	-2.2390*	5.569E-02	.000	-2.3631	-2.1149
	2	-.3710*	5.569E-02	.000	-.4951	-.2469
	3	-.1033	5.569E-02	.093	-.2274	2.076E-02
	4	-.6967*	5.569E-02	.000	-.8208	-.5726

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX D 7

Results of the statistical analysis of the percentages of dry matter data for all cultivars.

ANOVA

%Dry matter

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		9.963	4	2.491	535.365	.000
	Linear Term	Contrast	5.173	1	5.173	1111.741	.000
		Deviation	4.791	3	1.597	343.239	.000
Within Groups			4.653E-02	10	4.653E-03		
Total			10.010	14			

Multiple Comparisons

Dependent Variable: %Dry matter

LSD

(I) 1=GQ,2=Pm,3=PK,4=RF,5=TG	(J) 1=GQ,2=Pm,3=PK,4=RF,5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-1.8680*	5.569E-02	.000	-1.9921	-1.7439
	3	-2.1357*	5.569E-02	.000	-2.2598	-2.0116
	4	-1.5423*	5.569E-02	.000	-1.6664	-1.4182
	5	-2.2390*	5.569E-02	.000	-2.3631	-2.1149
2	1	1.8680*	5.569E-02	.000	1.7439	1.9921
	3	-.2677*	5.569E-02	.001	-.3918	-.1436
	4	.3257*	5.569E-02	.000	.2016	.4498
	5	-.3710*	5.569E-02	.000	-.4951	-.2469
3	1	2.1357*	5.569E-02	.000	2.0116	2.2598
	2	.2677*	5.569E-02	.001	.1436	.3918
	4	.5933*	5.569E-02	.000	.4692	.7174
	5	-.1033	5.569E-02	.093	-.2274	2.076E-02
4	1	1.5423*	5.569E-02	.000	1.4182	1.6664
	2	-.3257*	5.569E-02	.000	-.4498	-.2016
	3	-.5933*	5.569E-02	.000	-.7174	-.4692
	5	-.6967*	5.569E-02	.000	-.8208	-.5726
5	1	2.2390*	5.569E-02	.000	2.1149	2.3631
	2	.3710*	5.569E-02	.000	.2469	.4951
	3	.1033	5.569E-02	.093	-2.0760E-02	.2274
	4	.6967*	5.569E-02	.000	.5726	.8208

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX D 8

Results of the statistical analysis of the percentages of ash data for all cultivars.

ANOVA

%Ash

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		4.510	4	1.128	6.467	.008
	Linear Term	Contrast	3.046	1	3.046	17.474	.002
		Deviation	1.464	3	.488	2.798	.095
Within Groups			1.743	10	.174		
Total			6.254	14			

Multiple Comparisons

Dependent Variable: %Ash

LSD

(I) 1=GQ,2=Pm,3=PK,4=RF,5=TG	(J) 1=GQ,2=Pm,3=PK,4=RF,5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	1.2600*	.3409	.004	.5004	2.0196
	3	1.1900*	.3409	.006	.4304	1.9496
	4	1.2733*	.3409	.004	.5137	2.0330
	5	1.5867*	.3409	.001	.8270	2.3463
2	1	-1.2600*	.3409	.004	-2.0196	-.5004
	3	-7.0000E-02	.3409	.841	-.8296	.6896
	4	1.333E-02	.3409	.970	-.7463	.7730
	5	.3267	.3409	.361	-.4330	1.0863
3	1	-1.1900*	.3409	.006	-1.9496	-.4304
	2	7.000E-02	.3409	.841	-.6896	.8296
	4	8.333E-02	.3409	.812	-.6763	.8430
	5	.3967	.3409	.272	-.3630	1.1563
4	1	-1.2733*	.3409	.004	-2.0330	-.5137
	2	-1.3333E-02	.3409	.970	-.7730	.7463
	3	-8.3333E-02	.3409	.812	-.8430	.6763
	5	.3133	.3409	.380	-.4463	1.0730
5	1	-1.5867*	.3409	.001	-2.3463	-.8270
	2	-.3267	.3409	.361	-1.0863	.4330
	3	-.3967	.3409	.272	-1.1563	.3630
	4	-.3133	.3409	.380	-1.0730	.4463

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX D 9

Results of the statistical analysis of the percentages of fat data for all cultivars.

ANOVA

%Fat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.998	4	1.749	1.215	.364
Within Groups	14.402	10	1.440		
Total	21.399	14			

Multiple Comparisons

Dependent Variable: %Fat

LSD

(I) 1=GQ,2=Pm,3=PK,4=RF,5=TG	(J) 1=GQ,2=Pm,3=PK,4=RF,5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.7767	.9799	.446	-2.9599	1.4066
	3	-.8933	.9799	.383	-3.0766	1.2899
	4	.7933	.9799	.437	-1.3899	2.9766
	5	.5667	.9799	.576	-1.6166	2.7499
2	1	.7767	.9799	.446	-1.4066	2.9599
	3	-.1167	.9799	.908	-2.2999	2.0666
	4	1.5700	.9799	.140	-.6133	3.7533
	5	1.3433	.9799	.200	-.8399	3.5266
3	1	.8933	.9799	.383	-1.2899	3.0766
	2	.1167	.9799	.908	-2.0666	2.2999
	4	1.6867	.9799	.116	-.4966	3.8699
	5	1.4600	.9799	.167	-.7233	3.6433
4	1	-.7933	.9799	.437	-2.9766	1.3899
	2	-1.5700	.9799	.140	-3.7533	.6133
	3	-1.6867	.9799	.116	-3.8699	.4966
	5	-.2267	.9799	.822	-2.4099	1.9566
5	1	-.5667	.9799	.576	-2.7499	1.6166
	2	-1.3433	.9799	.200	-3.5266	.8399
	3	-1.4600	.9799	.167	-3.6433	.7233
	4	.2267	.9799	.822	-1.9566	2.4099

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX E

Results of the statistical analysis of the content of intact glucosinolates data.

Multiple Comparisons

Dependent Varable: Experimental Data
LSD

(I)	(J)	Mean Difference (I-J)	Std. Error	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-1.0571	6.8471	.878	-15.0407	12.9264
	3	3.6714*	6.8471	.000	-10.3122	17.6550
	4	4.4143*	6.8471	.000	-9.5693	18.3979
	5	-2.0286	6.8471	.769	-16.0122	11.9550
2	1	1.0571	6.8471	.878	-12.9264	15.0407
	3	4.7286*	6.8471	.000	-9.2550	18.7122
	4	5.4714*	6.8471	.000	-8.5122	19.4550
	5	-.9714	6.8471	.888	-14.9550	13.0122
3	1	-3.6714*	6.8471	.000	-17.6550	10.3122
	2	-4.7286*	6.8471	.000	-18.7122	9.2550
	4	.7429	6.8471	.914	-13.2407	14.7264
	5	-5.7000*	6.8471	.000	-19.6836	8.2836
4	1	-4.4143*	6.8471	.000	-18.3979	9.5693
	2	-5.4714*	6.8471	.000	-19.4550	8.5122
	3	-.7429	6.8471	.914	-14.7264	13.2407
	5	-6.4429*	6.8471	.000	-20.4264	7.5407
5	1	2.0286	6.8471	.769	-11.9550	16.0122
	2	.9714	6.8471	.888	-13.0122	14.9550
	3	5.7000	6.8471	.000	-8.2836	19.6836
	4	6.4429	6.8471	.000	-7.507	20.4264

*. The mean difference is singificant at the .05 level.

** 1=Green Queen, 2=Packman, 3=Pak Ging, 4=Rod Fai, 5=Top Green#067

APPENDIX F 1

The data used to construct calibration curve for
3-methylsulfinylpropyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.026	13.97	232.29	0.06	13.89	221.48	0.063	13.45	221.94	0.061	0.06	0.0014
0.057	21.01	230.11	0.09	20.64	230.24	0.090	21.17	229.52	0.092	0.09	0.0013
0.11	36.81	229.98	0.16	38.59	230.52	0.167	38.65	229.63	0.168	0.17	0.0045
0.15	55.14	230.17	0.24	55.27	223.78	0.247	54.89	228.79	0.240	0.24	0.0042
0.17	60.01	230.24	0.26	61.04	224.89	0.271	61.04	230.15	0.265	0.27	0.0054

* Peak areas of *X* = peak areas of 3-methylpropyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX F 2

The data used to construct calibration curve for 4-methylsulfinylbutyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.031	92.07	232.29	0.40	90.44	221.48	0.41	90.38	221.94	0.41	0.40	0.0066
0.1	196.54	230.11	0.85	193.58	230.24	0.84	196.4	229.52	0.86	0.85	0.0081
0.2	372.56	229.98	1.62	370.34	230.52	1.61	370.9	229.63	1.62	1.61	0.0068
0.3	550.41	230.17	2.39	547.04	223.78	2.44	544.3	228.79	2.38	2.41	0.0349
0.4	714.06	230.24	3.10	721.53	224.89	3.21	719.4	230.15	3.13	3.15	0.0561

* Peak areas of *X* = peak areas of 4-methylsulfinylbutyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX F 3

The data used to construct calibration curve for
5-methylsulfinylpentyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.025	10.86	232.29	0.05	11.78	221.48	0.05	10.94	221.94	0.05	0.05	0.0032
0.05	18.91	230.11	0.08	17.54	230.24	0.08	21.75	229.52	0.09	0.08	0.0095
0.10	34.36	229.98	0.15	33.64	230.52	0.15	32.18	229.63	0.14	0.15	0.0047
0.15	51.45	230.17	0.22	50.57	223.78	0.23	51.87	228.79	0.23	0.23	0.0017
0.18	67.82	230.24	0.29	66.21	224.89	0.29	67.51	230.15	0.29	0.29	0.0007

* Peak areas of *X* = peak areas of 5-methylsulfinylpentyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX F 4

The data used to construct calibration curve for
4-hydroxy-3-indolymethyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.022	64.93	232.29	0.28	63.05	221.48	0.28	63.89	221.94	0.29	0.28	0.0042
0.031	113.03	230.11	0.49	113.65	230.24	0.49	112.46	229.52	0.49	0.49	0.0019
0.062	226.47	229.98	0.98	228.42	230.52	0.99	231.21	229.63	1.01	0.99	0.0114
0.093	295.31	230.17	1.28	299.23	223.78	1.34	296.11	228.79	1.29	1.30	0.0286
0.124	412.51	230.24	1.79	400.54	224.89	1.78	410.48	230.15	1.78	1.79	0.0055

* Peak areas of *X* = peak areas of 4-hydroxy-3-indolymethyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX F 5

The data used to construct calibration curve for
4-methylthiobutyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.028	51.1	232.29	0.22	51.28	221.48	0.23	48.69	221.94	0.22	0.22	0.0068
0.062	139.1	230.11	0.60	137.58	230.24	0.60	137.9	229.52	0.60	0.60	0.0034
0.1	204.7	229.98	0.89	197.84	230.52	0.86	200.5	229.63	0.87	0.87	0.0159
0.15	285.4	230.17	1.24	287.06	223.78	1.28	282.4	228.79	1.23	1.25	0.0266
0.2	379.9	230.24	1.65	370.28	224.89	1.65	378.3	230.15	1.64	1.65	0.0031

* Peak areas of *X* = peak areas of 4-methylthiobutyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX F 6

The data used to construct calibration curve for
4-methoxy-3-indolymethyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.021	24.96	232.29	0.11	25.11	221.48	0.11	25.04	221.94	0.11	0.11	0.0033
0.041	60.22	230.11	0.26	62.85	230.24	0.27	62.01	229.52	0.27	0.27	0.0059
0.08	151.8	229.98	0.66	152.28	230.52	0.66	154.04	229.63	0.67	0.66	0.0061
0.1	179.51	230.17	0.78	179.84	223.78	0.80	180.35	228.79	0.79	0.79	0.0120
0.12	223.31	230.24	0.97	220.68	224.89	0.98	223.14	230.15	0.97	0.97	0.0067

* Peak areas of *X* = peak areas of 4-methoxy-3-indolymethyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX F 7

The data used to construct calibration curve for
1-methoxy-3-indolymethyl glucosinolate.

Concentration (umol/g)	Peak areas 1			Peak areas 2			Peak areas 3			Mean	S.D.
	X	int.std.	ratio	*X*	int.std.	ratio	*X*	int.std.	ratio		
0.022	30.93	232.29	0.13	28.97	221.48	0.13	29.98	221.94	0.14	0.13	0.0021
0.03	54.30	230.11	0.24	54.78	230.24	0.24	53.19	229.52	0.23	0.24	0.0032
0.056	112.69	229.98	0.49	120.05	230.52	0.52	114.58	229.63	0.50	0.50	0.0158
0.098	204.62	230.17	0.89	207.64	223.78	0.93	208.11	228.79	0.91	0.91	0.0195
0.14	289.04	230.24	1.26	290.46	224.89	1.29	290.10	230.15	1.26	1.27	0.0196

* Peak areas of *X* = peak areas of 1-methoxy-3-indolymethyl glucosinolate

** Peak areas of internal standard (int.std.) = peak areas of benzylglucosinolate

APPENDIX G 1

Results of the statistical analysis of the phenolics (1), flavonoids (2), flavonols (3), ascorbic acid (4), β-carotene (5) and tocopherols (6) data for Green Queen cultivar.

Descriptives

assay method: Green Queen

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	1.22667	1.1547E-02	6.67E-03	1.19798	1.25535	1.220	1.240
2	3	1.02733	7.0238E-03	4.06E-03	1.00989	1.04478	1.020	1.034
3	3	1.02433	1.5275E-03	8.82E-04	1.02054	1.02813	1.023	1.026
4	3	3.47E-02	2.0817E-03	1.20E-03	2.9496E-02	3.9838E-02	.033	.037
5	3	.52667	3.0551E-03	1.76E-03	.51908	.53426	.524	.530
6	3	1.81E-02	2.0000E-04	1.15E-04	1.7603E-02	1.8597E-02	.018	.018
Total	18	.64296	.49847	.11749	.39508	.89085	.018	1.240

Test of Homogeneity of Variances

assay method: Green Queen

Levene Statistic	df1	df2	Sig.
6.029	5	12	.005

ANOVA

assay method: Green Queen

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		4.224	5	.845	25507.09	.000
	Linear Term	Contrast	3.122	1	3.122	94257.99	.000
		Deviation	1.102	4	.276	8319.364	.000
Within Groups			3.974E-04	12	3.312E-05		
Total			4.224	17			

Multiple Comparisons

Dependent Variable: assay method: Green Queen

LSD

(I) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	(J) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.19933*	4.70E-03	.000	.18910	.20957
	3	.20233*	4.70E-03	.000	.19210	.21257
	4	1.19200*	4.70E-03	.000	1.18176	1.20224
	5	.70000*	4.70E-03	.000	.68976	.71024
	6	1.20857*	4.70E-03	.000	1.19833	1.21880
2	1	-.19933*	4.70E-03	.000	-.20957	-.18910
	3	3.0000E-03	4.70E-03	.535	-7.23776E-03	1.3238E-02
	4	.99267*	4.70E-03	.000	.98243	1.00290
	5	.50067*	4.70E-03	.000	.49043	.51090
	6	1.00923*	4.70E-03	.000	.99900	1.01947
3	1	-.20233*	4.70E-03	.000	-.21257	-.19210
	2	-3.0000E-03	4.70E-03	.535	-1.32378E-02	7.2378E-03
	4	.98967*	4.70E-03	.000	.97943	.99990
	5	.49767*	4.70E-03	.000	.48743	.50790
	6	1.00623*	4.70E-03	.000	.99600	1.01647
4	1	-1.19200*	4.70E-03	.000	-1.20224	-1.18176
	2	-.99267*	4.70E-03	.000	-1.00290	-.98243
	3	-.98967*	4.70E-03	.000	-.99990	-.97943
	5	-.49200*	4.70E-03	.000	-.50224	-.48176
	6	1.6567E-02*	4.70E-03	.004	6.3289E-03	2.6804E-02
5	1	-.70000*	4.70E-03	.000	-.71024	-.68976
	2	-.50067*	4.70E-03	.000	-.51090	-.49043
	3	-.49767*	4.70E-03	.000	-.50790	-.48743
	4	.49200*	4.70E-03	.000	.48176	.50224
	6	.50857*	4.70E-03	.000	.49833	.51880
6	1	-1.20857*	4.70E-03	.000	-1.21880	-1.19833
	2	-1.00923*	4.70E-03	.000	-1.01947	-.99900
	3	-1.00623*	4.70E-03	.000	-1.01647	-.99600
	4	-1.6567E-02*	4.70E-03	.004	-2.68044E-02	-6.32891E-03
	5	-.50857*	4.70E-03	.000	-.51880	-.49833

*. The mean difference is significant at the .05 level.

APPENDIX G 2

Results of the statistical analysis of the phenolics (1), flavonoids (2), flavonols (3), ascorbic acid (4), β-carotene (5) and tocopherols (6) data for Packman cultivar.

Descriptives

assay method: Packman

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	1.17000	2.6458E-02	1.53E-02	1.10428	1.23572	1.140	1.190
2	3	1.01700	4.0951E-02	2.36E-02	.91527	1.11873	.989	1.064
3	3	1.07267	4.7258E-03	2.73E-03	1.06093	1.08441	1.069	1.078
4	3	3.80E-02	1.7321E-03	1.00E-03	3.3697E-02	4.2303E-02	.036	.039
5	3	.56667	3.0551E-03	1.76E-03	.55908	.57426	.564	.570
6	3	1.53E-02	5.7735E-05	3.33E-05	1.5190E-02	1.5477E-02	.015	.015
Total	18	.64661	.49162	.11588	.40214	.89109	.015	1.190

Test of Homogeneity of Variances

assay method: Packman

Levene Statistic	df1	df2	Sig.
9.651	5	12	.001

ANOVA

assay method: Packman

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		4.104	5	.821	2042.007	.000
	Linear Term	Contrast	2.853	1	2.853	7097.909	.000
		Deviation	1.251	4	.313	778.031	.000
Within Groups			4.823E-03	12	4.019E-04		
Total			4.109	17			

Multiple Comparisons

Dependent Variable: assay method: Packman

LSD

(I) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitI	(J) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitI	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.15300*	1.64E-02	.000	.11733	.18867
	3	9.7333E-02*	1.64E-02	.000	6.1667E-02	.13300
	4	1.13200*	1.64E-02	.000	1.09633	1.16767
	5	.60333*	1.64E-02	.000	.56767	.63900
	6	1.15467*	1.64E-02	.000	1.11900	1.19033
2	1	-.15300*	1.64E-02	.000	-.18867	-.11733
	3	-5.5667E-02*	1.64E-02	.005	-9.13329E-02	-2.00004E-02
	4	.97900*	1.64E-02	.000	.94333	1.01467
	5	.45033*	1.64E-02	.000	.41467	.48600
	6	1.00167*	1.64E-02	.000	.96600	1.03733
3	1	-9.7333E-02*	1.64E-02	.000	-.13300	-6.16671E-02
	2	5.5667E-02*	1.64E-02	.005	2.0000E-02	9.1333E-02
	4	1.03467*	1.64E-02	.000	.99900	1.07033
	5	.50600*	1.64E-02	.000	.47033	.54167
	6	1.05733*	1.64E-02	.000	1.02167	1.09300
4	1	-1.13200*	1.64E-02	.000	-1.16767	-1.09633
	2	-.97900*	1.64E-02	.000	-1.01467	-.94333
	3	-1.03467*	1.64E-02	.000	-1.07033	-.99900
	5	-.52867*	1.64E-02	.000	-.56433	-.49300
	6	2.2667E-02	1.64E-02	.191	-1.2999GE-02	5.8333E-02
5	1	-.60333*	1.64E-02	.000	-.63900	-.56767
	2	-.45033*	1.64E-02	.000	-.48600	-.41467
	3	-.50600*	1.64E-02	.000	-.54167	-.47033
	4	.52867*	1.64E-02	.000	.49300	.56433
	6	.55133*	1.64E-02	.000	.51567	.58700
6	1	-1.15467*	1.64E-02	.000	-1.19033	-1.11900
	2	-1.00167*	1.64E-02	.000	-1.03733	-.96600
	3	-1.05733*	1.64E-02	.000	-1.09300	-1.02167
	4	-2.2667E-02	1.64E-02	.191	-5.83329E-02	1.3000E-02
	5	-.55133*	1.64E-02	.000	-.58700	-.51567

*. The mean difference is significant at the .05 level.

APPENDIX G 3

Results of the statistical analysis of the phenolics (1), flavonoids (2), flavonols (3), ascorbic acid (4), β-carotene (5) and tocopherol (6) data for Pak Ging cultivar.

Descriptives

assay method: Pak Ging

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	1.16667	5.7735E-03	3.33E-03	1.15232	1.18101	1.160	1.170
2	3	1.06300	4.5826E-03	2.65E-03	1.05162	1.07438	1.058	1.067
3	3	1.06000	5.5678E-03	3.21E-03	1.04617	1.07383	1.054	1.065
4	3	3.27E-02	1.5275E-03	8.82E-04	2.8872E-02	3.6461E-02	.031	.034
5	3	.59600	5.5678E-03	3.21E-03	.58217	.60983	.590	.601
6	3	1.72E-02	1.1547E-04	6.67E-05	1.6946E-02	1.7520E-02	.017	.017
Total	18	.65593	.49525	.11673	.40964	.90221	.017	1.170

Test of Homogeneity of Variances

assay method: Pak Ging

Levene Statistic	df1	df2	Sig.
2.568	5	12	.084

ANOVA

assay method: Pak Ging

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		4.169	5	.834	42158.12	.000
	Linear Term	Contrast	2.865	1	2.865	144819.0	.000
		Deviation	1.305	4	.326	16492.90	.000
Within Groups			2.374E-04	12	1.978E-05		
Total			4.170	17			

Multiple Comparisons

Dependent Variable: assay method: Pak Ging

LSD

(I) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	(J) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.10367*	3.63E-03	.000	9.5755E-02	.11158
	3	.10667*	3.63E-03	.000	9.8755E-02	.11458
	4	1.13400*	3.63E-03	.000	1.12609	1.14191
	5	.57067*	3.63E-03	.000	.56275	.57858
	6	1.14943*	3.63E-03	.000	1.14152	1.15735
2	1	-.10367*	3.63E-03	.000	-.11158	-9.57546E-02
	3	3.0000E-03	3.63E-03	.425	-4.91202E-03	1.0912E-02
	4	1.03033*	3.63E-03	.000	1.02242	1.03825
	5	.46700*	3.63E-03	.000	.45909	.47491
	6	1.04577*	3.63E-03	.000	1.03785	1.05368
3	1	-.10667*	3.63E-03	.000	-.11458	-9.87546E-02
	2	-3.0000E-03	3.63E-03	.425	-1.09120E-02	4.9120E-03
	4	1.02733*	3.63E-03	.000	1.01942	1.03525
	5	.46400*	3.63E-03	.000	.45609	.47191
	6	1.04277*	3.63E-03	.000	1.03485	1.05068
4	1	-1.13400*	3.63E-03	.000	-1.14191	-1.12609
	2	-1.03033*	3.63E-03	.000	-1.03825	-1.02242
	3	-1.02733*	3.63E-03	.000	-1.03525	-1.01942
	5	-.56333*	3.63E-03	.000	-.57125	-.55542
	6	1.5433E-02*	3.63E-03	.001	7.5213E-03	2.3345E-02
5	1	-.57067*	3.63E-03	.000	-.57858	-.56275
	2	-.46700*	3.63E-03	.000	-.47491	-.45909
	3	-.46400*	3.63E-03	.000	-.47191	-.45609
	4	.56333*	3.63E-03	.000	.55542	.57125
	6	.57877*	3.63E-03	.000	.57085	.58668
6	1	-1.14943*	3.63E-03	.000	-1.15735	-1.14152
	2	-1.04577*	3.63E-03	.000	-1.05368	-1.03785
	3	-1.04277*	3.63E-03	.000	-1.05068	-1.03485
	4	-1.5433E-02*	3.63E-03	.001	-2.33454E-02	-7.52131E-03
	5	-.57877*	3.63E-03	.000	-.58668	-.57085

*. The mean difference is significant at the .05 level.

APPENDIX G 4

Results of the statistical analysis of the phenolic (1), flavonoids (2), flavonol (3), ascorbic acid (4), β-carotene (5) and tocopherol (6) data for Rod Fai cultivar.

Descriptives

assay method: Rod Fai

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	.89667	3.7859E-02	2.19E-02	.80262	.99071	.870	.940
2	3	.89833	4.0673E-02	2.35E-02	.79729	.99937	.860	.941
3	3	.96267	5.1316E-03	2.96E-03	.94992	.97541	.957	.967
4	3	2.14E-02	1.2503E-03	7.22E-04	1.8327E-02	2.4539E-02	.020	.022
5	3	.50233	1.0786E-02	6.23E-03	.47554	.52913	.490	.510
6	3	1.34E-02	2.0817E-04	1.20E-04	1.2850E-02	1.3884E-02	.013	.014
Total	18	.54913	.41662	9.82E-02	.34195	.75631	.013	.967

Test of Homogeneity of Variances

assay method: Rod Fai

Levene Statistic	df1	df2	Sig.
5.041	5	12	.010

ANOVA

assay method: Rod Fai

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		2.944	5	.589	1093.201	.000
	Linear Term	Contrast	1.836	1	1.836	3409.006	.000
		Deviation	1.108	4	.277	514.250	.000
Within Groups			5.464E-03	12	5.387E-04		
Total			2.951	17			

Multiple Comparisons

Dependent Variable: assay method: Rod Fai

LSD

(I) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	(J) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-1.6667E-03	1.90E-02	.931	-4.29553E-02	3.9622E-02
	3	-6.6000E-02*	1.90E-02	.005	-.10729	-2.47114E-02
	4	.87523*	1.90E-02	.000	.83394	.91652
	5	.39433*	1.90E-02	.000	.35304	.43562
	6	.88330*	1.90E-02	.000	.84201	.92459
2	1	1.6667E-03	1.90E-02	.931	-3.96219E-02	4.2955E-02
	3	-6.4333E-02*	1.90E-02	.005	-.10562	-2.30447E-02
	4	.87690*	1.90E-02	.000	.83561	.91819
	5	.39600*	1.90E-02	.000	.35471	.43729
	6	.88497*	1.90E-02	.000	.84368	.92626
3	1	6.6000E-02*	1.90E-02	.005	2.4711E-02	.10729
	2	6.4333E-02*	1.90E-02	.005	2.3045E-02	.10562
	4	.94123*	1.90E-02	.000	.89994	.98252
	5	.46033*	1.90E-02	.000	.41904	.50162
	6	.94930*	1.90E-02	.000	.90801	.99059
4	1	-.87523*	1.90E-02	.000	-.91652	-.83394
	2	-.87690*	1.90E-02	.000	-.91819	-.83561
	3	-.94123*	1.90E-02	.000	-.98252	-.89994
	5	-.48090*	1.90E-02	.000	-.52219	-.43961
	6	8.0667E-03	1.90E-02	.678	-3.32219E-02	4.9355E-02
5	1	-.39433*	1.90E-02	.000	-.43562	-.35304
	2	-.39600*	1.90E-02	.000	-.43729	-.35471
	3	-.46033*	1.90E-02	.000	-.50162	-.41904
	4	.48090*	1.90E-02	.000	.43961	.52219
	6	.48897*	1.90E-02	.000	.44768	.53026
6	1	-.88330*	1.90E-02	.000	-.92459	-.84201
	2	-.88497*	1.90E-02	.000	-.92626	-.84368
	3	-.94930*	1.90E-02	.000	-.99059	-.90801
	4	-8.0667E-03	1.90E-02	.678	-4.93553E-02	3.3222E-02
	5	-.48897*	1.90E-02	.000	-.53026	-.44768

*. The mean difference is significant at the .05 level.

APPENDIX G 5

Results of the statistical analysis of the phenolic (1), flavonoids (2), flavonol (3), ascorbic acid (4), β-carotene (5) and tocopherol (6) data for Top Green #067 cultivar.

Descriptives

assay method: Top Green #067

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	3	1.57333	5.7735E-03	3.33E-03	1.55899	1.58768	1.570	1.580
2	3	1.46767	3.9068E-02	2.26E-02	1.37062	1.56472	1.430	1.508
3	3	1.12800	2.6458E-03	1.53E-03	1.12143	1.13457	1.126	1.131
4	3	4.53E-02	2.0817E-03	1.20E-03	4.0162E-02	5.0504E-02	.043	.047
5	3	.63633	3.2146E-03	1.86E-03	.62835	.64432	.634	.640
6	3	2.28E-02	1.5275E-04	8.82E-05	2.2454E-02	2.3213E-02	.023	.023
Total	18	.81225	.64423	.15185	.49188	1.13262	.023	1.580

Test of Homogeneity of Variances

assay method: Top Green #067

Levene Statistic	df1	df2	Sig.
4.185	5	12	.020

ANOVA

assay method: Top Green #067

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		7.052	5	1.410	5351.666	.000
	Linear Term	Contrast	5.501	1	5.501	20870.87	.000
		Deviation	1.552	4	.388	1471.865	.000
Within Groups			3.163E-03	12	2.636E-04		
Total			7.056	17			

Multiple Comparisons

Dependent Variable: assay method: Top Green #067

LSD

(I) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	(J) 1=phenolics 2=flavonoids 3=flavonols 4=vitC 5=B-carotene 6=vitE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.10567*	1.33E-02	.000	7.6786E-02	.13455
	3	.44533*	1.33E-02	.000	.41645	.47421
	4	1.52800*	1.33E-02	.000	1.49912	1.55688
	5	.93700*	1.33E-02	.000	.90812	.96588
	6	1.55050*	1.33E-02	.000	1.52162	1.57938
2	1	-.10567*	1.33E-02	.000	-.13455	7.67856E-02
	3	.33967*	1.33E-02	.000	.31079	.36855
	4	1.42233*	1.33E-02	.000	1.39345	1.45121
	5	.83133*	1.33E-02	.000	.80245	.86021
	6	1.44483*	1.33E-02	.000	1.41595	1.47371
3	1	-.44533*	1.33E-02	.000	-.47421	-.41645
	2	-.33967*	1.33E-02	.000	-.36855	-.31079
	4	1.08267*	1.33E-02	.000	1.05379	1.11155
	5	.49167*	1.33E-02	.000	.46279	.52055
	6	1.10517*	1.33E-02	.000	1.07629	1.13405
4	1	-1.52800*	1.33E-02	.000	-1.55688	-1.49912
	2	-1.42233*	1.33E-02	.000	-1.45121	-1.39345
	3	-1.08267*	1.33E-02	.000	-1.11155	-1.05379
	5	-.59100*	1.33E-02	.000	-.61988	-.56212
	6	2.2500E-02	1.33E-02	.115	6.38109E-03	5.1381E-02
5	1	-.93700*	1.33E-02	.000	-.96588	-.90812
	2	-.83133*	1.33E-02	.000	-.86021	-.80245
	3	-.49167*	1.33E-02	.000	-.52055	-.46279
	4	.59100*	1.33E-02	.000	.56212	.61988
	6	.61350*	1.33E-02	.000	.58462	.64238
6	1	-1.55050*	1.33E-02	.000	-1.57938	-1.52162
	2	-1.44483*	1.33E-02	.000	-1.47371	-1.41595
	3	-1.10517*	1.33E-02	.000	-1.13405	-1.07629
	4	-2.2500E-02	1.33E-02	.115	5.13811E-02	6.3811E-03
	5	-.61350*	1.33E-02	.000	-.64238	-.58462

*. The mean difference is significant at the .05 level.

APPENDIX G 6

Results of the statistical analysis of the phenolic data for all cultivars.

ANOVA

assay: Phenolics

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.702	4	.175	375.893	.000
Within Groups	4.667E-03	10	4.667E-04		
Total	.706	14			

Multiple Comparisons

Dependent Variable: assay: Phenolics

LSD

(I) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	(J) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	5.667E-02*	1.764E-02	.009	1.737E-02	9.597E-02
	3	6.000E-02*	1.764E-02	.007	2.070E-02	9.930E-02
	4	.3300*	1.764E-02	.000	.2907	.3693
	5	-.3467*	1.764E-02	.000	-.3860	-.3074
2	1	-5.6667E-02*	1.764E-02	.009	-9.5967E-02	-1.7366E-02
	3	3.333E-03	1.764E-02	.854	-3.5967E-02	4.263E-02
	4	.2733*	1.764E-02	.000	.2340	.3126
	5	-.4033*	1.764E-02	.000	-.4426	-.3640
3	1	-6.0000E-02*	1.764E-02	.007	-9.9301E-02	-2.0699E-02
	2	-3.3333E-03	1.764E-02	.854	-4.2634E-02	3.597E-02
	4	.2700*	1.764E-02	.000	.2307	.3093
	5	-.4067*	1.764E-02	.000	-.4460	-.3674
4	1	-.3300*	1.764E-02	.000	-.3693	-.2907
	2	-.2733*	1.764E-02	.000	-.3126	-.2340
	3	-.2700*	1.764E-02	.000	-.3093	-.2307
	5	-.6767*	1.764E-02	.000	-.7160	-.6374
5	1	.3467*	1.764E-02	.000	.3074	.3860
	2	.4033*	1.764E-02	.000	.3640	.4426
	3	.4067*	1.764E-02	.000	.3674	.4460
	4	.6767*	1.764E-02	.000	.6374	.7160

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX G 7

Results of the statistical analysis of the flavonoids data for all cultivars.

ANOVA

assay: Flavonoids

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		.568	4	.142	144.007	.000
	Linear Term	Contrast	.174	1	.174	176.738	.000
		Deviation	.394	3	.131	133.097	.000
Within Groups			9.856E-03	10	9.856E-04		
Total			.578	14			

Multiple Comparisons

Dependent Variable: assay: Flavonoids

LSD

(I) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	(J) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	1.0333E-02	2.56E-02	.695	-4.67812E-02	6.7448E-02
	3	-3.5667E-02	2.56E-02	.194	-9.27812E-02	2.1448E-02
	4	.12900*	2.56E-02	.001	7.1885E-02	.18611
	5	-.44033*	2.56E-02	.000	-.49745	-.38322
2	1	-1.0333E-02	2.56E-02	.695	-6.74479E-02	4.6781E-02
	3	-4.6000E-02	2.56E-02	.103	-.10311	1.1115E-02
	4	.11867*	2.56E-02	.001	6.1552E-02	.17578
	5	-.45067*	2.56E-02	.000	-.50778	-.39355
3	1	3.5667E-02	2.56E-02	.194	-2.14479E-02	9.2781E-02
	2	4.6000E-02	2.56E-02	.103	-1.11146E-02	.10311
	4	.16467*	2.56E-02	.000	.10755	.22178
	5	-.40467*	2.56E-02	.000	-.46178	-.34755
4	1	-.12900*	2.56E-02	.001	-.18611	-7.18854E-02
	2	-.11867*	2.56E-02	.001	-.17578	-6.15521E-02
	3	-.16467*	2.56E-02	.000	-.22178	-.10755
	5	-.56933*	2.56E-02	.000	-.62645	-.51222
5	1	.44033*	2.56E-02	.000	.38322	.49745
	2	.45067*	2.56E-02	.000	.39355	.50778
	3	.40467*	2.56E-02	.000	.34755	.46178
	4	.56933*	2.56E-02	.000	.51222	.62645

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX G 8

Results of the statistical analysis of the flavonols data for all cultivars.

ANOVA

assay: Flavonols

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.495E-02	4	1.124E-02	631.288	.000
Within Groups	1.780E-04	10	1.780E-05		
Total	4.513E-02	14			

Multiple Comparisons

Dependent Variable: assay: Flavonols

LSD

(I) 1=GQ, 2=Pm, 3=PK, 4=RF, 5=TG	(J) 1=GQ, 2=Pm, 3=PK, 4=RF, 5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-4.8333E-02*	3.44E-03	.000	-5.60088E-02	-4.06578E-02
	3	-3.5667E-02*	3.44E-03	.000	-4.33422E-02	-2.79912E-02
	4	6.1667E-02*	3.44E-03	.000	5.3991E-02	6.9342E-02
	5	-.10367*	3.44E-03	.000	-.11134	-9.59912E-02
2	1	4.8333E-02*	3.44E-03	.000	4.0658E-02	5.6009E-02
	3	1.2667E-02*	3.44E-03	.004	4.9912E-03	2.0342E-02
	4	.11000*	3.44E-03	.000	.10232	.11768
	5	-5.5333E-02*	3.44E-03	.000	-6.30088E-02	-4.76578E-02
3	1	3.5667E-02*	3.44E-03	.000	2.7991E-02	4.3342E-02
	2	-1.2667E-02*	3.44E-03	.004	-2.03422E-02	-4.99117E-03
	4	9.7333E-02*	3.44E-03	.000	8.9658E-02	.10501
	5	-6.8000E-02*	3.44E-03	.000	-7.56755E-02	-6.03245E-02
4	1	-6.1667E-02*	3.44E-03	.000	-6.93422E-02	-5.39912E-02
	2	-.11000*	3.44E-03	.000	-.11768	-.10232
	3	-9.7333E-02*	3.44E-03	.000	-.10501	-8.96578E-02
	5	-.16533*	3.44E-03	.000	-.17301	-.15766
5	1	.10367*	3.44E-03	.000	9.5991E-02	.11134
	2	5.5333E-02*	3.44E-03	.000	4.7658E-02	6.3009E-02
	3	6.8000E-02*	3.44E-03	.000	6.0325E-02	7.5675E-02
	4	.16533*	3.44E-03	.000	.15766	.17301

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX G 9

Results of the statistical analysis of the ascorbic acid data for all cultivars.

ANOVA

assay: Ascorbic acid

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		9.111E-04	4	2.278E-04	73.178	.000
	Linear Term	Contrast	6.816E-06	1	6.816E-06	2.190	.170
		Deviation	9.043E-04	3	3.014E-04	96.841	.000
Within Groups			3.113E-05	10	3.113E-06		
Total			9.422E-04	14			

Multiple Comparisons

Dependent Variable: assay: Ascorbic acid

LSD

(I) 1=GQ, 2=Pm, 3=PK, 4=RF, 5=TG	(J) 1=GQ, 2=Pm, 3=PK, 4=RF, 5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-3.3333E-03*	1.44E-03	.043	-6.5430E-03	-1.2364E-04
	3	2.00000E-03	1.44E-03	.195	-1.2097E-03	5.20969E-03
	4	1.32333E-02*	1.44E-03	.000	1.00236E-02	1.64430E-02
	5	-1.0667E-02*	1.44E-03	.000	-1.3876E-02	-7.4570E-03
2	1	3.33333E-03*	1.44E-03	.043	1.23645E-04	6.54302E-03
	3	5.33333E-03*	1.44E-03	.004	2.12364E-03	8.54302E-03
	4	1.65667E-02*	1.44E-03	.000	1.33570E-02	1.97764E-02
	5	-7.3333E-03*	1.44E-03	.000	-1.0543E-02	-4.1236E-03
3	1	-2.0000E-03	1.44E-03	.195	-5.2097E-03	1.20969E-03
	2	-5.3333E-03*	1.44E-03	.004	-8.5430E-03	-2.1236E-03
	4	1.12333E-02*	1.44E-03	.000	8.02364E-03	1.44430E-02
	5	-1.2667E-02*	1.44E-03	.000	-1.5876E-02	-9.4570E-03
4	1	-1.3233E-02*	1.44E-03	.000	-1.6443E-02	-1.0024E-02
	2	-1.6567E-02*	1.44E-03	.000	-1.9776E-02	-1.3357E-02
	3	-1.1233E-02*	1.44E-03	.000	-1.4443E-02	-8.0236E-03
	5	-2.3900E-02*	1.44E-03	.000	-2.7110E-02	-2.0690E-02
5	1	1.06667E-02*	1.44E-03	.000	7.45698E-03	1.38764E-02
	2	7.33333E-03*	1.44E-03	.000	4.12364E-03	1.05430E-02
	3	1.26667E-02*	1.44E-03	.000	9.45698E-03	1.58764E-02
	4	2.39000E-02*	1.44E-03	.000	2.06903E-02	2.71097E-02

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX G 10

Results of the statistical analysis of the β-carotene data for all cultivars.

ANOVA

assay: B-carotene

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		3.434E-02	4	8.585E-03	243.438	.000
	Linear Term	Contrast	7.208E-03	1	7.208E-03	204.371	.000
		Deviation	2.713E-02	3	9.044E-03	256.460	.000
Within Groups			3.527E-04	10	3.527E-05		
Total			3.469E-02	14			

Multiple Comparisons

Dependent Variable: assay: B-carotene

LSD

(I) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	(J) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-4.0000E-02*	4.85E-03	.000	-5.08039E-02	-2.91961E-02
	3	-6.9333E-02*	4.85E-03	.000	-8.01372E-02	-5.85295E-02
	4	2.4333E-02*	4.85E-03	.001	1.3529E-02	3.5137E-02
	5	-.10967*	4.85E-03	.000	-.12047	-9.88628E-02
2	1	4.0000E-02*	4.85E-03	.000	2.9196E-02	5.0804E-02
	3	-2.9333E-02*	4.85E-03	.000	-4.01372E-02	-1.85295E-02
	4	6.4333E-02*	4.85E-03	.000	5.3529E-02	7.5137E-02
	5	-6.9667E-02*	4.85E-03	.000	-8.04705E-02	-5.88628E-02
3	1	6.9333E-02*	4.85E-03	.000	5.8529E-02	8.0137E-02
	2	2.9333E-02*	4.85E-03	.000	1.8529E-02	4.0137E-02
	4	9.3667E-02*	4.85E-03	.000	8.2863E-02	.10447
	5	-4.0333E-02*	4.85E-03	.000	-5.11372E-02	-2.95295E-02
4	1	-2.4333E-02*	4.85E-03	.001	-3.51372E-02	-1.35295E-02
	2	-6.4333E-02*	4.85E-03	.000	-7.51372E-02	-5.35295E-02
	3	-9.3667E-02*	4.85E-03	.000	-.10447	-8.28628E-02
	5	-.13400*	4.85E-03	.000	-.14480	-.12320
5	1	.10967*	4.85E-03	.000	9.8863E-02	.12047
	2	6.9667E-02*	4.85E-03	.000	5.8863E-02	8.0471E-02
	3	4.0333E-02*	4.85E-03	.000	2.9529E-02	5.1137E-02
	4	.13400*	4.85E-03	.000	.12320	.14480

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX G 11

Results of the statistical analysis of the tocopherols data for all cultivars.

ANOVA

assay: Tocopherols

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.517E-04	4	3.793E-05	1537.730	.000
Within Groups	2.467E-07	10	2.467E-08		
Total	1.520E-04	14			

Multiple Comparisons

Dependent Variable: assay: Tocopherols

LSD

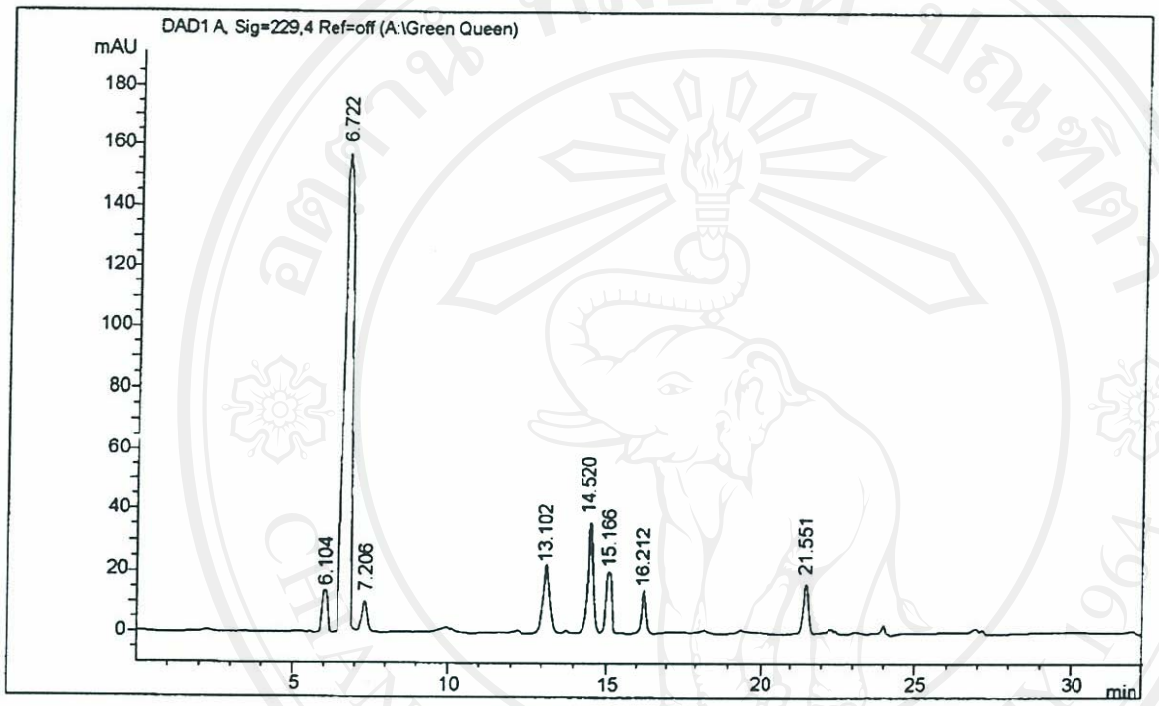
(I) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	(J) 1=GQ, 2=Pm, 3=PG, 4=RF, 5=TG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	2.76667E-03*	1.28E-04	.000	2.48094E-03	3.05239E-03
	3	8.66667E-04*	1.28E-04	.000	5.80939E-04	1.15239E-03
	4	4.73333E-03*	1.28E-04	.000	4.44761E-03	5.01906E-03
	5	-4.7333E-03*	1.28E-04	.000	-5.0191E-03	-4.4476E-03
2	1	-2.7667E-03*	1.28E-04	.000	-3.0524E-03	-2.4809E-03
	3	-1.9000E-03*	1.28E-04	.000	-2.1857E-03	-1.6143E-03
	4	1.96667E-03*	1.28E-04	.000	1.68094E-03	2.25239E-03
	5	-7.5000E-03*	1.28E-04	.000	-7.7857E-03	-7.2143E-03
3	1	-8.6667E-04*	1.28E-04	.000	-1.1524E-03	-5.8094E-04
	2	1.90000E-03*	1.28E-04	.000	1.61427E-03	2.18573E-03
	4	3.86667E-03*	1.28E-04	.000	3.58094E-03	4.15239E-03
	5	-5.6000E-03*	1.28E-04	.000	-5.8857E-03	-5.3143E-03
4	1	-4.7333E-03*	1.28E-04	.000	-5.0191E-03	-4.4476E-03
	2	-1.9667E-03*	1.28E-04	.000	-2.2524E-03	-1.6809E-03
	3	-3.8667E-03*	1.28E-04	.000	-4.1524E-03	-3.5809E-03
	5	-9.4667E-03*	1.28E-04	.000	-9.7524E-03	-9.1809E-03
5	1	4.73333E-03*	1.28E-04	.000	4.44761E-03	5.01906E-03
	2	7.50000E-03*	1.28E-04	.000	7.21427E-03	7.78573E-03
	3	5.60000E-03*	1.28E-04	.000	5.31427E-03	5.88573E-03
	4	9.46667E-03*	1.28E-04	.000	9.18094E-03	9.75239E-03

*. The mean difference is significant at the .05 level.

**1=Green Queen (GQ), 2=Packman (Pm), 3=Pak Ging (PG), 4=Rod Fai (RF) and 5=Top Green #067

APPENDIX H 1

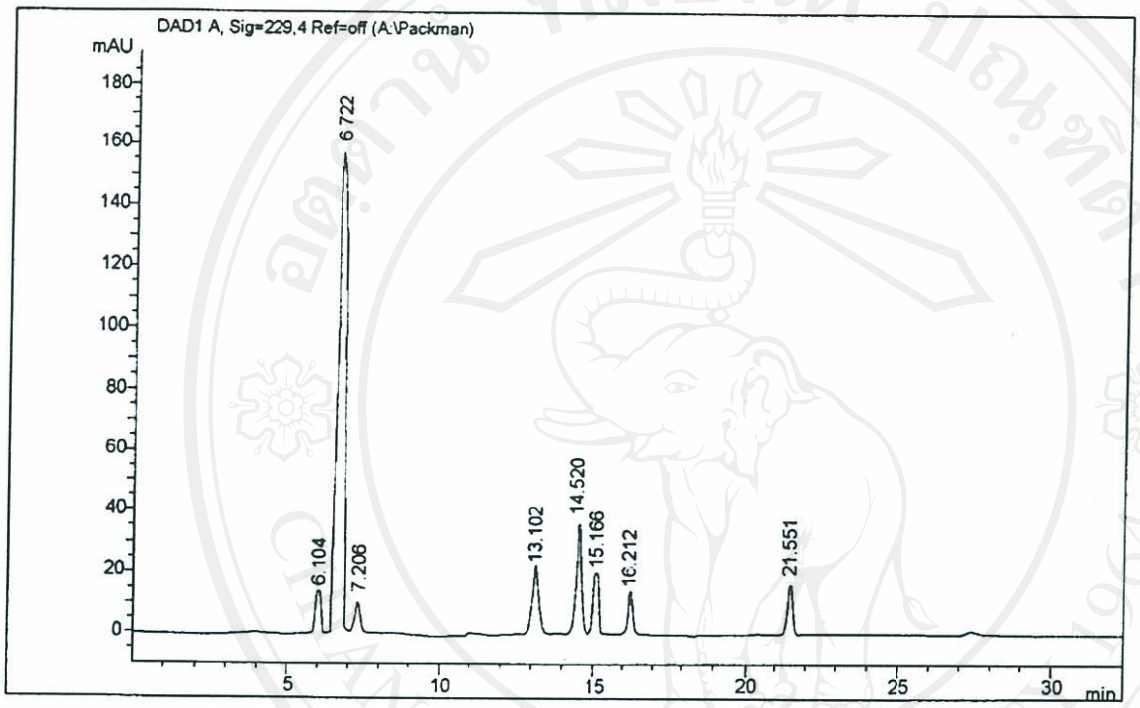
HPLC chromatogram of glucosinolates from 'Green Queen' cultivar.



Peaks; 3-methylsulfinylpropyl-(6.104 min); 4-methylsulfinylbutyl-(6.722 min); 5-methylsulfinylpentyl-(7.206 min); 4-hydroxy-3-indolylmethyl-(13.102 min); 4-methylthiobutyl-(14.520 min); benzyl-(internal standard, 15.166 min); 4-methoxy-3-indolymethyl-(16.212 min) and 1-methoxy-3-indolylmethyl- (21.551 min) glucosinolates.

APPENDIX H 2

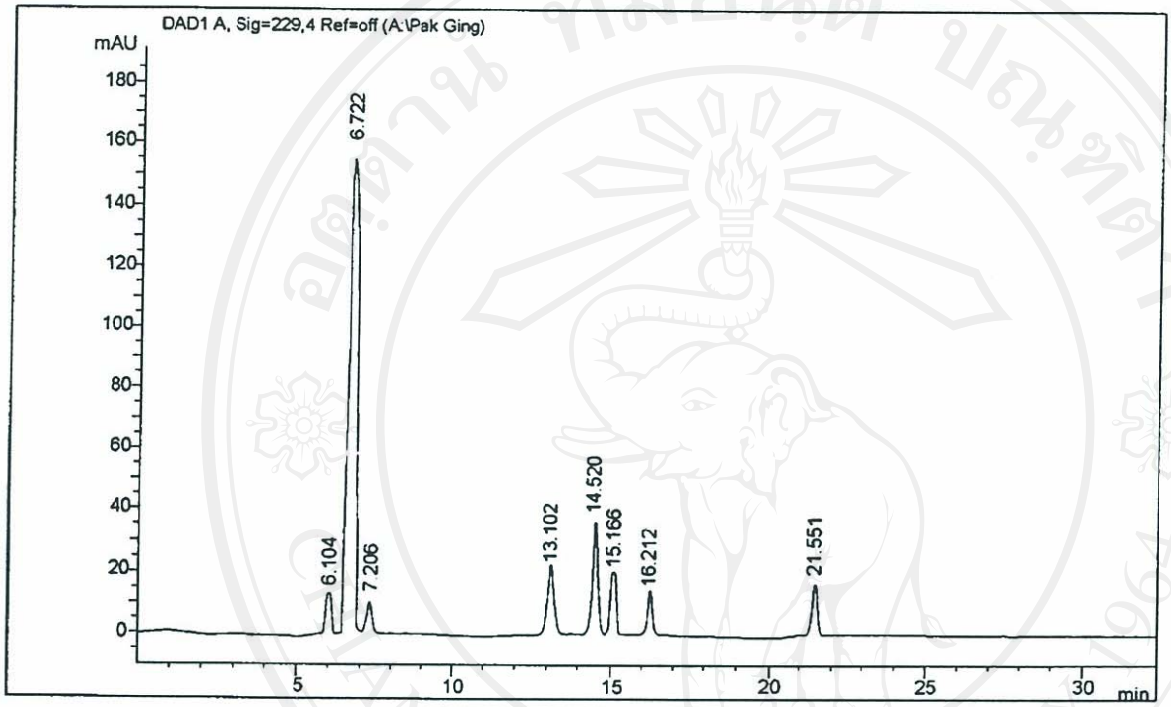
HPLC chromatogram of glucosinolates from 'Packman' cultivar.



Peaks; 3-methylsulfinylpropyl-(6.104 min); 4-methylsulfinylbutyl-(6.722 min); 5-methylsulfinylpentyl-(7.206 min); 4-hydroxy-3-indolylmethyl-(13.102 min); 4-methylthiobutyl-(14.520 min); benzyl-(internal standard, 15.166 min); 4-methoxy-3-indolymethyl-(16.212 min) and 1-methoxy-3-indolylmethyl- (21.551 min) glucosinolates.

APPENDIX H 3

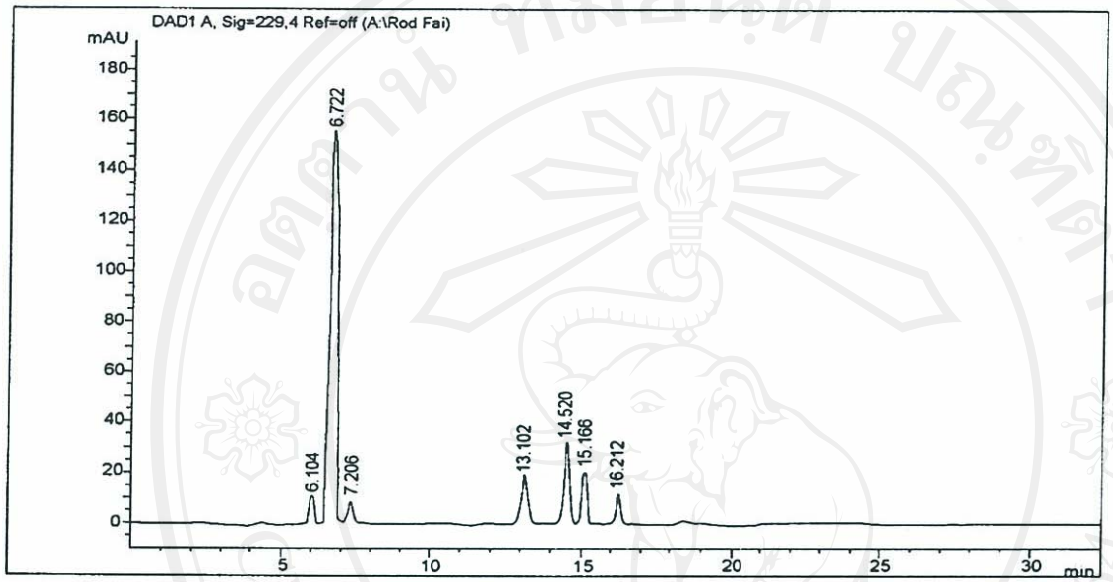
HPLC chromatogram of glucosinolates from 'Pak Ging' cultivar.



Peaks; 3-methylsulfinylpropyl-(6.104 min); 4-methylsulfinylbutyl-(6.722 min); 5-methylsulfinylpentyl-(7.206 min); 4-hydroxy-3-indolylmethyl-(13.102 min); 4-methylthiobutyl-(14.520 min); benzyl-(internal standard, 15.166 min); 4-methoxy-3-indolymethyl-(16.212 min) and 1-methoxy-3-indolylmethyl- (21.551 min) glucosinolates.

APPENDIX H 4

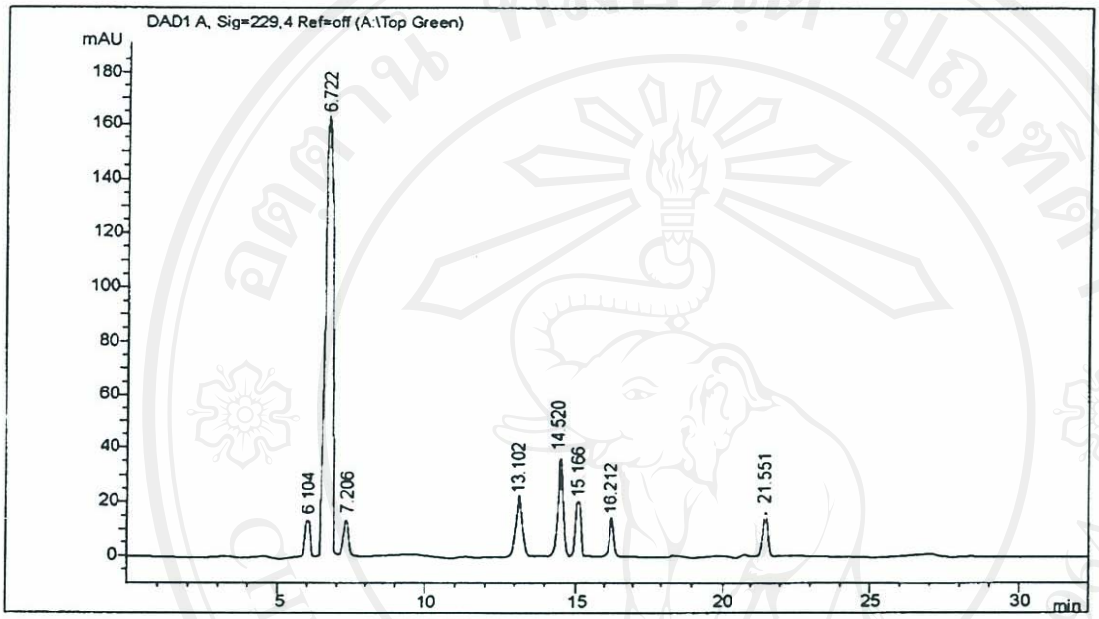
HPLC chromatogram of glucosinolates from 'Rod Fai' cultivar.



Peaks; 3-methylsulfinylpropyl-(6.104 min); 4-methylsulfinylbutyl-(6.722 min); 5-methylsulfinylpentyl-(7.206 min); 4-hydroxy-3-indolylmethyl-(13.102 min); 4-methylthiobutyl-(14.520 min); benzyl-(internal standard, 15.166 min); 4-methoxy-3-indolymethyl-(16.212 min) and 1-methoxy-3-indolylmethyl- (21.551 min) glucosinolates.

APPENDIX H 5

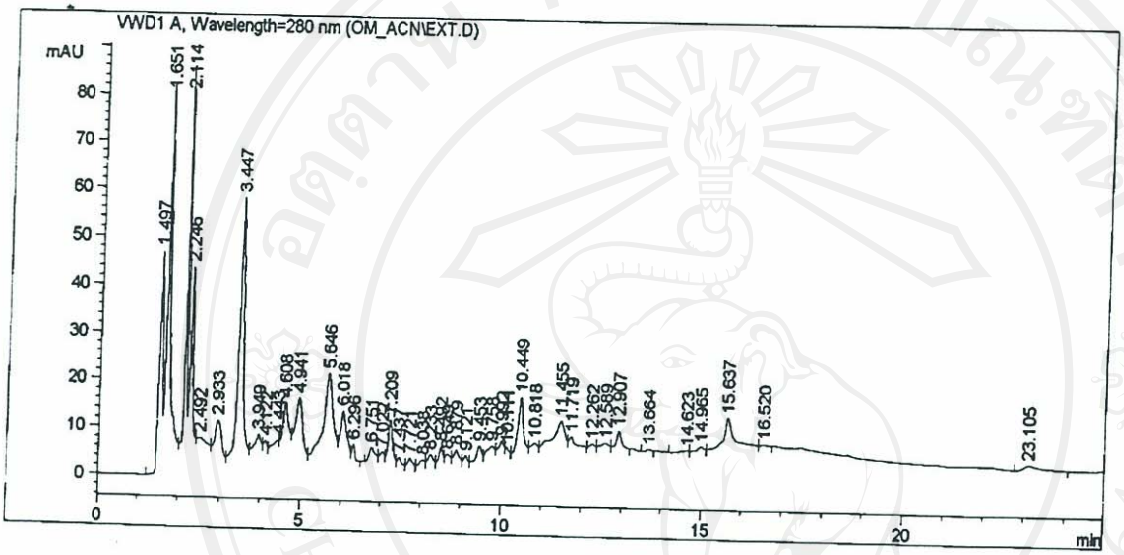
HPLC chromatogram of glucosinolates from 'Top Green #067' cultivar.



Peaks; 3-methylsulfinylpropyl-(6.104 min); 4-methylsulfinylbutyl-(6.722 min); 5-methylsulfinylpentyl-(7.206 min); 4-hydroxy-3-indolylmethyl-(13.102 min); 4-methylthiobutyl-(14.520 min); benzyl-(internal standard, 15.166 min); 4-methoxy-3-indolymethyl-(16.212 min) and 1-methoxy-3-indolylmethyl- (21.551 min) glucosinolates.

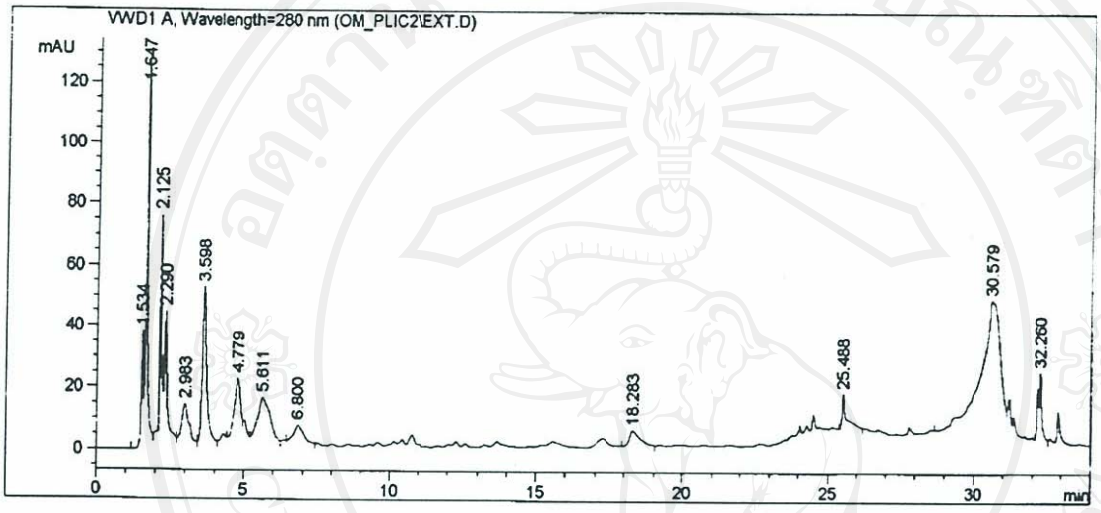
APPENDIX I 1

HPLC chromatogram of phenolic compounds of the extract from 'Green Queen' broccoli seeds.



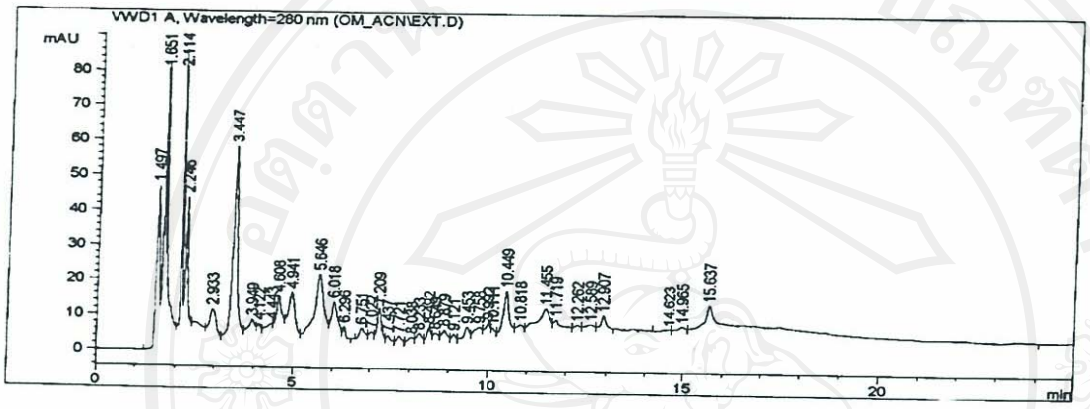
APPENDIX I 2

HPLC chromatogram of phenolic compounds of the extract from 'Packman' broccoli seeds.



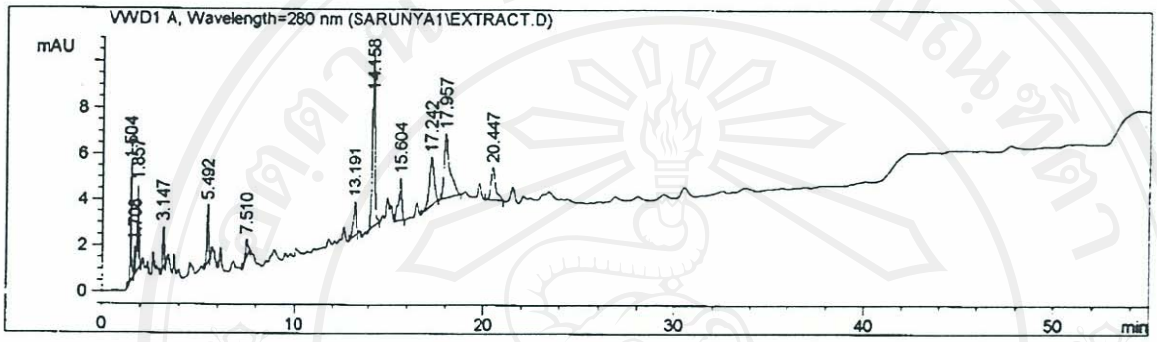
APPENDIX I 3

HPLC chromatogram of phenolic compounds of the extract from 'Pak Ging' broccoli seeds.



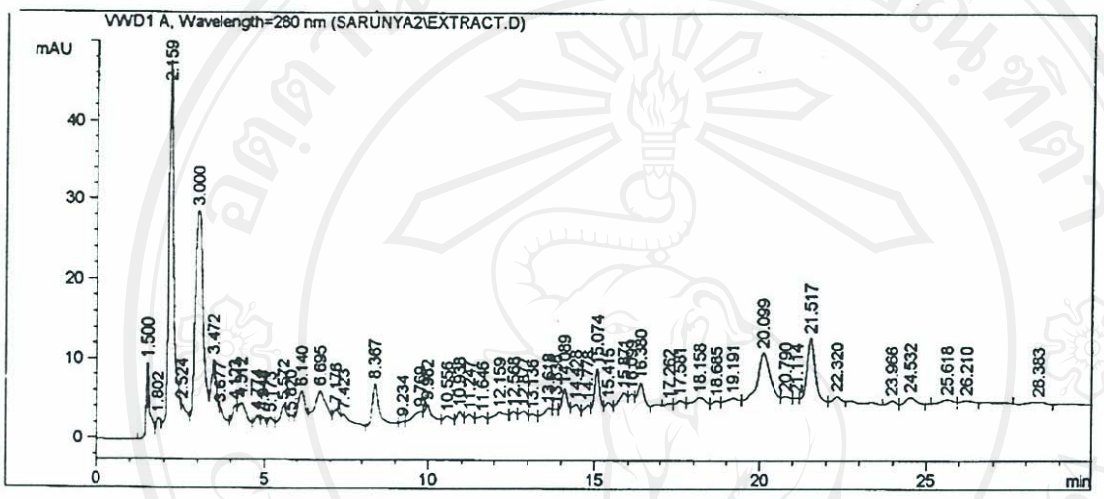
APPENDIX I 4

HPLC chromatogram of phenolic compounds of the extract from 'Rod Fai' broccoli seeds.



APPENDIX I 5

HPLC chromatogram of phenolic compounds of the extract from 'Top Green#067' broccoli seeds.



APPENDIX J 1

Correlation coefficient between total glucosinolates and antioxidant compounds in 'Green Queen' cultivar.

Compounds	*Total glucosinolates*	*Phenolics*	*Flavonoids*	*Flavonols*	*Ascorbic acid*	*B-carotene*	*Tocopherols*
Total glucosinolates	1.000						
Phenolics	0.388	1.000					
Flavonoids	0.922	0.714	1.000				
Flavonols	0.875	0.106	0.620	1.000			
Ascorbic acid	0.997	0.452	0.948	0.839	1.000		
B-carotene	0.857	0.808	0.989	0.500	0.691	1.000	
Tocopherols	0.985	0.224	0.842	0.945	0.670	0.855	1.000

APPENDIX J 2

Correlation coefficient between total glucosinolates and antioxidant compounds in 'Packman' cultivar.

Compounds	*Total glucosinolates*	*Phenolics*	*Flavonoids*	*Flavonols*	*Ascorbic acid*	*B-carotene*	*Tocopherols*
Total glucosinolates	1.000						
Phenolics	0.685	1.000					
Flavonoids	0.439	0.955	1.000				
Flavonols	0.985	0.800	0.586	1.000			
Ascorbic acid	0.464	0.327	0.592	0.305	1.000		
B-carotene	0.931	0.371	0.080	0.854	0.756	1.000	
Tocopherols	0.999	0.655	0.402	0.977	0.500	0.945	1.000

APPENDIX J 3

Correlation coefficient between total glucosinolates and antioxidant compounds in 'Pak Ging' cultivar.

Compounds	*Total glucosinolates*	*Phenolics*	*Flavonoids*	*Flavonols*	*Ascorbic acid*	*B-carotene*	*Tocopherols*
Total glucosinolates	1.000						
Phenolics	0.957	1.000					
Flavonoids	0.533	0.756	1.000				
Flavonols	0.789	0.933	0.941	1.000			
Ascorbic acid	0.533	0.756	0.764	0.941	1.000		
B-carotene	0.562	0.778	0.999	0.952	0.667	1.000	
Tocopherols	0.957	0.635	0.756	0.933	0.756	0.778	1.000

APPENDIX J 4

Correlation coefficient between total glucosinolates and antioxidant compounds in 'Rod Fai' cultivar.

Compounds	*Total glucosinolates*	*Phenolics*	*Flavonoids*	*Flavonols*	*Ascorbic acid*	*B-carotene*	*Tocopherols*
Total glucosinolates	1.000						
Phenolics	0.226	1.000					
Flavonoids	0.329	0.845	1.000				
Flavonols	0.199	0.909	0.991	1.000			
Ascorbic acid	0.739	0.489	0.880	0.808	1.000		
B-carotene	0.725	0.506	0.889	0.819	0.659	1.000	
Tocopherols	0.651	0.592	0.931	0.874	0.643	0.995	1.000

APPENDIX J 5

Correlation coefficient between total glucosinolates and antioxidant compounds in 'Top Green #067' cultivar.

Compounds	*Total glucosinolates*	*Phenolics*	*Flavonoids*	*Flavonols*	*Ascorbic acid*	*B-carotene*	*Tocopherols*
Total glucosinolates	1.000						
Phenolics	0.822	1.000					
Flavonoids	0.899	0.835	1.000				
Flavonols	0.807	0.327	0.793	1.000			
Ascorbic acid	0.935	0.971	0.943	0.545	1.000		
B-carotene	0.901	0.988	0.910	0.470	0.458	1.000	
Tocopherols	0.081	0.501	0.058	0.654	0.279	0.648	1.000

APPENDIX K

Rapeseed informations

Brassica napus Linnaeus; known as rapeseed, rape, oilseed rape, and in some cultivars, Canola; is a mustard crop grown primarily for its seed which yields about forty percent oil and a high-protein animal feed. Recent interest in the crop has centered around cultivars that have low erucic acid and are thus desirable edible oils. Traditional and other uses have been for lamp oils, soap making, high-temperature and tenacious high-erucic acid lubricating oils, and plastics manufacturing. Other species of *Brassica* are also grown as rapeseed oil, but they are not the subject of this EA.

Taxonomy of Rapeseed

Brassica is a genus of the Brassicaceae (Cruciferae), commonly known as the mustard family. The family, of about 375 genera and 3200 species, includes crops, condiments, ornamentals, and many weeds. Brassica contains about 100 species, including cabbage, cauliflower, broccoli, brussels sprouts, turnip, various mustards and weeds.

Brassica napus belongs to a group of six genetically related species:

- *B. nigra* (Linnaeus) Koch, black mustard, a diploid species n=8, originally spread by trade over much of the Old World, and now spread as a weed throughout much of the New World, including virtually all of the United States.
- *B. oleracea* Linnaeus, cabbage, broccoli, brussels sprouts, cauliflower, kale, a diploid species n=9, originally confined to the Mediterranean, but now widely grown in temperate gardens.
- *B. rapa* Linnaeus (=*B. campestris* Linnaeus), field mustard, turnip, turnip rape, bird rape, a diploid species n=10, originally spread throughout much of Europe, Asia, northern India, and northern Africa, and now either grown as a vegetable or oil crop, or spread as an occasional weed in much of the United States.
- *B. carinata* A. Braun, Abyssinian mustard, Ethiopian mustard, an allotetraploid species n=17, derived from *B. nigra* and *B. oleracea*, presumed to come from an ancient cross or crosses in northeast Africa, and occasionally grown in the United States as a novelty.
- *B. juncea* (Linnaeus) Czerniakowska et Cosson, Indian mustard, brown mustard, mustard greens, an allotetraploid species n=18, derived from Old World crosses of *B. nigra* and *B. rapa*, and now grown for the leaves, or spread as an occasional weed in crops or waste places.

- *B. napus* Linnaeus, the subject of this EA, an allotetraploid species n=19, derived from ancient crosses between *B. oleracea* and *B. campestris*, and now grown widely for its oil, and an occasional weed or volunteer in cultivated fields.

Rapeseed (flower)

Rapeseed has been linked with adverse effects in asthma and hay fever sufferers. Some suggest that oilseed pollen is the cause of increased breathing difficulties. This is unlikely however, as rapeseed is an entomophilous crop, with pollen transfer primarily by insects. Others suggest that it is the inhalation of oilseed rape dust that causes this, and that allergies to the pollen are relatively rare. There may also be a another effect at work; since rapeseed in flower has a distinctive and pungent smell, hayfever sufferers may wrongly jump to the conclusion that it is the rapeseed that is to blame simply because they can smell it.

Reference: Niewiadomski, H. 1990. Rapeseed. pp. 11-12. Amsterdam; Elsevier.

CURRICULUM VITAE

Name: Miss Sarunya Chuanphongpanich

Date of Birth: January 6, 1977

Place of Birth: Chiang Mai, Thailand.

Education:

2001-2005	Bachelor of Law (LL.B.), Sukothaithumatirat Open University
1999-2001	Master Degree in Pharmaceutical Chemistry, Faculty of Pharmacy, Chiang Mai University
1994-1998	Bachelor of Pharmacy, Faculty of Pharmacy, Chiang Mai University

Research Grants:

2004	National Research Council of Thailand
2002	The Graduate School, Chiang Mai University

Experience:

2002-2004	President of Graduate Student, Faculty of Pharmacy, Chiang Mai University
1999-2000	Vice President of Graduate Student, Chiang Mai University

Member: The Pharmacy Council of Thailand

Publications in International Journal:

1. **Chuanphongpanich, S.**, Tuwanon, N., Bhuddasukh, D., Pirakitikulr, P. and Phanichphant, S. Stanol synthesis from palm oil distillate. *Chiang Mai Journal of Science, in press.*
2. **Chuanphongpanich, S.**, Phanichphant, S., Bhuddasukh, D., Suttajit, M. and Sirithunyalug, B. Bioactive glucosinolates and antioxidant properties of broccoli seeds cultivated in Thailand. *Songklanakarin Journal of Science and Technology, in press.*
3. **Chuanphongpanich, S.**, Phanichphant, S., Bhuddasukh, D., Suttajit, M. and Sirithunyalug, B. Antioxidant capacity of broccoli seeds grown in Thailand. *Chiang Mai Journal of Science, in press.*

Proceeding from International Conferences:

1. **Chuanphongpanich, S,** Phanichphant, S., Bhuddasukh, D., Suttajit, M. and Sirithunyalug, B. Bioactive glucosinolates and antioxidant properties of broccoli seeds available in Thailand. *Proceedings of the 10th World Congress on Clinical Nutrition*, 30 November–3 December 2004, Phuket, Thailand.
2. Sirithunyalug, B., **Chuanphongpanich, S.**, Bhuddasukh, D. and Phanichphant, S. Bioactive glucosinolates in broccoli seeds of Thai cultivars. *Proceedings of the 12th International Pharmaceutical Technology Symposium*, 12-15 September 2004, Istanbul, Turkey.
3. **Chuanphongpanich, S.**, Phanichphant, S., Bhuddasukh, D., Suttajit, M. and Sirithunyalug, B. Antioxidant capacity of broccoli seeds grown in Thailand. *Proceedings from oral presentation section of the 1th International Conference on Natural Products for Health and Beauty*, 17-21 October 2005, Faculty of Science, Mahasarakham University, Thailand.

Proceeding from Conferences in Thailand:

1. **Chuanphongpanich, S.**, Phanichphant, S., Bhuddasukh, D., Suttajit, M. and Sirithunyalug, B. Bioactive glucosinolates of broccoli seeds of available in Thailand. *Proceedings of the 4th National Symposium on Graduate Research*, 11-12 August 2004, Chiang Mai, Thailand.

Special Training:

Short course on Intellectual Property: How to & Management, 18 February 2005, Sheraton Chiang Mai Hotel, sponsored by Intellectual Property Alumni Association (IPAA) and Japan External Trade Organizaton (JETRO).