



**APPENDICES**

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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## APPENDIX A

**Table 1** Pollinated flowers on diallel crossing scheme of 27 HT rose varieties (20 Feb, 2003 to 16 Aug 2004)

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.	No. Plants	Flowers/plants
Azure Sea	1	6		74	29	5		17	1	42	10		12		6	202	10	20.2	22	9.2
Bridal Pink	2		1	60	6	5		2	5	12		1	1		6	99	10	9.9	14	7.1
Black Magic	3		2	163	44	39		16	3	27	7		3		19	323	10	32.3	37	8.7
Dallas	4			131	19	125		66	18	34	4		18		31	446	9	49.6	132	3.4
Diplomat	5	7	5	158	52	82		67	2	140	16	23	20	6	18	596	13	45.8	122	4.9
Emblem	6	21	11	180	64	24	4	76	3	87	25	10	7		73	585	13	45.0	103	5.7
Emerald	7			28	4	1		4	1							38	5	7.6	8	4.8
Fragrant Cloud	8			95	15	28	3	22	1	29	6		5		13	217	10	21.7	26	8.3
First Red	9		18	195	63	130	6	16	12	136	26	13	40	3	35	693	13	53.3	178	3.9
Frisco	10	19		81	2	4		11	3	16	9				10	155	9	17.2	16	9.7
Jade	11			16	7			3	6	3	3		3			41	7	5.9	11	3.7
Josephine Charlotte	12	16		120	22	9		35		17	10	3	2		23	257	10	25.7	29	8.9
Kardinal	13		4	47	22	9		12		26			7		3	130	8	16.3	18	7.2
Naomi	14		3	18	5			10	3	4					3	46	7	6.6	12	3.8
Osiana	15	9	3	159	128	62	5	105		23	7	27	38	7	45	618	13	47.5	142	4.4
Pink Noblesse	16	5	5	189	142	60		94	8	48	3	14	36	10	37	651	13	50.1	115	5.7
Paris	17			98	7	8		21	4	17		16			6	177	8	22.1	23	7.7
Raphaella	18			72	6	12		10	1	12	3	2	1		9	128	10	12.8	17	7.5
Ravel	19			39	12	3		3		2			3		2	64	7	9.1	14	4.6
Sundance	20			28	13	17	8	11		8	6		6		6	103	9	11.4	24	4.3
Saphir	21			152	95	79	10	50	7	100	14		20		41	568	10	56.8	116	4.9
Tineke	22	1	7	138	51	61	29	63	8	169	10	8	11		108	664	13	51.1	137	4.8
Top Secret	23			95	36	9		5	2	16	1		7		2	173	9	19.2	30	5.8
Texas	24	8		49	13	7	5	13	1	12	6		1	1	3	119	12	9.9	17	7.0
Vendela	25			120	19	23		21		26	7	1	3		13	233	9	25.9	30	7.8
Vivaldi	26	8	7	147	13	14		31	1	85	7	15	16		10	354	12	29.5	65	5.4
White Noblesse	27		4	70	36	6		19		14	1	5			9	164	9	18.2	22	7.5
Sum.		100	70	2722	925	822	70	803	90	1105	181	138	260	27	531	7844	268	26.7	1480	166.5
Count		10	12	27	27	25	8	27	20	26	21	13	22	5	25	268				27
Av.		10.0	5.8	100.8	34.3	32.9	8.75	29.7	4.5	42.5	8.6	10.6	11.8	5.4	21.2	23.4				6.2

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse).

**Table 2** Number of hips on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.	%FD/Crosses
Azure Sea	1	5		48	25	4		7	FD	22	5		7		3	566.3	9	62.9	10.0
Bridal Pink	2		FD	8	2	1		1	2	7		FD	FD		FD	215.0	6	35.8	40.0
Black Magic	3		FD	42	9	3		4	FD	23	FD		2		2	241.3	7	34.5	30.0
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-	100.0
Diplomat	5	3	2	68	35	74		36	FD	100	3	7	9	2	9	586.1	12	48.8	7.7
Emblem	6	2	2	42	54	7	3	36	FD	62	5	8	FD		56	534.9	11	48.6	15.4
Emerald	7			1	1	FD		FD	FD							28.6	2	14.3	60.0
Fragrant Cloud	8			28	11	3	FD	8	FD	25	2		2		7	363.3	8	45.4	20.0
First Red	9		1	116	58	37	FD	12	FD	105	4	11	6	FD	28	532.8	10	53.3	23.1
Frisco	10	FD		7	FD	2		FD	2	3	FD				7	214.1	5	42.8	44.4
Jade	11			4	5			1	FD	1	FD		1			196.4	5	39.3	28.6
Josephine Charlotte	12	FD		27	18	5		5		6	FD	1	FD		1	247.1	7	35.3	30.0
Kardinal	13			26	17	3		2		7			2		1	321.4	8	40.2	0.0
Naomi	14		1	2	4			FD	FD	2					FD	174.4	4	43.6	42.9
Osiana	15	FD	FD	59	105	43	2	20		5	5	13	32	5	26	602.3	11	54.8	15.4
Pink Noblesse	16	3	3	121	139	49		47	4	35	FD	4	24	1	23	703.9	12	58.7	7.7
Paris	17			19	4	5		10	FD	11		FD			FD	251.4	5	50.3	37.5
Raphaella	18			2	FD	1		FD	FD	2	FD	FD	FD		FD	27.8	3	9.3	70.0
Ravel	19			3	5	1		2		1			1		FD	232.7	6	38.8	14.3
Sundance	20			8	5	2	1	6		6	4		4		4	420.8	9	46.8	0.0
Saphir	21			72	90	13	FD	28	FD	85	1		16		39	481.8	8	60.2	20.0
Tineke	22	FD	2	40	31	32	6	22	2	76	FD	3	6		61	444.9	11	40.4	15.4
Top Secret	23			11	9	FD		1	FD	12	FD		FD		1	181.6	5	36.3	44.4
Texas	24	5		2	3	2	1	6	FD	9	1		FD	FD	2	342.7	9	38.1	25.0
Vendela	25			11	11	3		10		20	FD	FD	1		1	245.7	7	35.1	22.2
Vivaldi	26	FD	2	34	11	8		22	FD	50	3	6	8		4	496.1	10	49.6	16.7
White Noblesse	27		FD	10	16	2		3		5	FD	FD			5	199.1	6	33.2	33.3
Sum.		18.0	15.0	811.0	668.0	300.0	13.0	289.0	10.0	680.0	33.0	53.0	121.0	8.0	280.0	3299	196	13.5	28.7
Count		5	8	26	24	22	5	22	4	25	10	8	15	3	19	196			
Av.		3.6	1.9	31.2	27.8	13.6	2.6	13.1	2.5	27.2	3.3	6.6	8.1	2.7	14.7	11.4			
%FD/Crosses		50.0	33.3	3.7	11.1	12.0	37.5	18.5	80.0	3.8	52.4	38.5	31.8	40.0	24.0	31.2			

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse). FD = fruit drop

**Table 3** Percentage of fruit setting on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	83.3		64.9	86.2	80.0		41.2	FD	52.4	50.0		58.3		50.0	566.3	9	62.9
Bridal Pink	2		FD	13.3	33.3	20.0		50.0	40.0	58.3		FD	FD		FD	215.0	6	35.8
Black Magic	3		FD	25.8	20.5	7.7		25.0	FD	85.2	FD		66.7		10.5	241.3	7	34.5
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	42.9	40.0	43.0	67.3	90.2		53.7	FD	71.4	18.8	30.4	45.0	33.3	50.0	586.1	12	48.8
Emblem	6	9.5	18.2	23.3	84.4	29.2	75.0	47.4	FD	71.3	20.0	80.0	FD		76.7	534.9	11	48.6
Emerald	7			3.6	25.0	FD		FD	FD							28.6	2	14.3
Fragrant Cloud	8			29.5	73.3	10.7	FD	36.4	FD	86.2	33.3		40.0		53.8	363.3	8	45.4
First Red	9		5.6	59.5	92.1	28.5	FD	75.0	FD	77.2	15.4	84.6	15.0	FD	80.0	532.8	10	53.3
Frisco	10	FD		8.6	FD	50.0		FD	66.7	18.8	FD				70.0	214.1	5	42.8
Jade	11			25.0	71.4			33.3	FD	33.3	FD		33.3			196.4	5	39.3
Josephine Charlotte	12	FD		22.5	81.8	55.6		14.3	35.3	FD	33.3	FD			4.3	247.1	7	35.3
Kardinal	13		50.0	55.3	77.3	33.3		16.7	26.9				28.6		33.3	321.4	8	40.2
Naomi	14		33.3	11.1	80.0			FD	FD	50.0					FD	174.4	4	43.6
Osiana	15	FD	FD	37.1	82.0	69.4	40.0	19.0	21.7	71.4	48.1	84.2	71.4	57.8	602.3	11	54.8	
Pink Noblesse	16	60.0	60.0	64.0	97.9	81.7		50.0	50.0	72.9	FD	28.6	66.7	10.0	62.2	703.9	12	58.7
Paris	17			19.4	57.1	62.5		47.6	FD	64.7		FD			FD	251.4	5	50.3
Raphaella	18	2.8		FD	8.3			FD	FD	16.7	FD	FD	FD		FD	27.8	3	9.3
Ravel	19			7.7	41.7	33.3		66.7		50.0			33.3		FD	232.7	6	38.8
Sundance	20			28.6	38.5	11.8	12.5	54.5		75.0	66.7		66.7		66.7	420.8	9	46.8
Saphir	21			47.4	94.7	16.5	FD	56.0	FD	85.0	7.1		80.0		95.1	481.8	8	60.2
Tineke	22	FD	28.6	29.0	60.8	52.5	20.7	34.9	25.0	45.0	FD	37.5	54.5		56.5	444.9	11	40.4
Top Secret	23			11.6	25.0	FD		20.0	FD	75.0	FD		FD		50.0	181.6	5	36.3
Texas	24	62.5		4.1	23.1	28.6	20.0	46.2	FD	75.0	16.7		FD	FD	66.7	342.7	9	38.1
Vendela	25			9.2	57.9	13.0		47.6		76.9	FD	FD	33.3		7.7	245.7	7	35.1
Vivaldi	26	FD	28.6	23.1	84.6	57.1		71.0	FD	58.8	42.9	40.0	50.0		40.0	496.1	10	49.6
White Noblesse	27		FD	14.3	44.4	33.3		15.8		35.7	FD	FD			55.6	199.1	6	33.2
Sum.		261.0	264.2	680.8	1500.3	873.1	168.2	922.3	181.7	1418.8	342.2	382.6	755.7	114.8	986.9	8852.5	196	42.2
Count		6.0	8.0	25.0	24.0	22.0	5.0	22.0	4.0	25.0	10.0	8.0	15.0	3.0	19.0	196		
Av.		43.5	33.0	27.2	62.5	39.7	33.6	41.9	45.4	56.8	34.2	47.8	50.4	38.3	51.9	40.4		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse). FD = fruit drop

**Table 4** No. of seeds/crosses on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	29		979	317	84		136	FD	619	3		250		84	2501	9	277.9
Bridal Pink	2		FD	143	1	1		2	16	94		FD	FD		FD	257	6	42.8
Black Magic	3		FD	817	60	10		25	FD	258	FD		3		38	1211	7	173.0
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	61	37	1773	837	1407		576	FD	1780	16	59	177	9	132	6864	12	572.0
Emblem	6	32	20	278	202	27	41	214	FD	197	14	19	FD		289	1333	11	121.2
Emerald	7			3	1	FD		FD	FD							4	2	2.0
Fragrant Cloud	8			263	80	12	FD	94	FD	180	17		12		42	700	8	87.5
First Red	9		1	1025	198	143	FD	42	FD	563	19	36	60	FD	174	2261	10	226.1
Frisco	10	FD		43	FD	16		FD	30	19	FD				12	120	5	24.0
Jade	11			129	19			11	FD	17	FD		12			188	5	37.6
Josephine Charlotte	12	FD		434	100	36		53		61	FD	8	FD		55	747	7	106.7
Kardinal	13		6	539	144	36		9		153			18		39	944	8	118.0
Naomi	14		12	14	28			FD	FD	46					FD	100	4	25.0
Osiana	15	FD	FD	1422	1637	408	33	736		162	49	263	389	42	438	5579	11	507.2
Pink Noblesse	16	67	68	1564	1868	643		637	70	740	FD	147	335	24	259	6422	12	535.2
Paris	17			244	6	15		103	FD	253		FD			FD	621	5	124.2
Raphaella	18			31	FD	15		FD	FD	30	FD	FD	FD		FD	76	3	25.3
Ravel	19			100	113	14		33		10			3		FD	273	6	45.5
Sundance	20			169	111	37	18	110		85	42		67		66	705	9	78.3
Saphir	21			1937	1229	273	FD	431	FD	1301	4		214		499	5888	8	736.0
Tineke	22	FD	10	895	489	718	76	434	16	2555	FD	50	87		913	6243	11	567.5
Top Secret	23			92	51	FD		11	FD	70	FD		FD		31	255	5	51.0
Texas	24	48		32	98	68	10	56	FD	99	7		FD	FD	1	419	9	46.6
Vendela	25			155	82	14		27		383	FD	FD	32		7	700	7	100.0
Vivaldi	26	FD	73	515	181	115		281	FD	1100	29	70	116		26	2506	10	250.6
White Noblesse	27		FD	138	59	12		27		61	FD	FD			52	349	6	58.2
Sum.		237	227	13734	7911	4104	178	4048	132	1083	200	652	1775	75	3157	47266	196	190.0
Count		5	8	26	24	22	5	22	4	25	10	8	15	3	19	196		
Av.		47.4	28.4	528.2	329.6	186.5	35.6	184.0	33.0	433.4	20.0	81.5	118.3	25	166.2	158.4		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse). FD = fruit drop

**Table 5** No. of seed/hips on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	5.8		20.4	12.7	21.0		19.4	FD	28.1	0.6		35.7		28.0	171.8	9	19.1
Bridal Pink	2		FD	17.9	0.5	1.0		2.0	8.0	13.4		FD	FD	FD	FD	42.8	6	7.1
Black Magic	3		FD	19.5	6.7	3.3		6.3	FD	11.2	FD		1.5	19.0	FD	67.4	7	9.6
Dallas	4			FD	FD	FD		FD	FD	F	FD		FD	FD	FD	-	-	-
Diplomat	5	20.3	18.5	26.1	23.9	19.0		16.0	FD	17.8	5.3	8.4	19.7	4.5	14.7	194.2	12	16.2
Emblem	6	16.0	10.0	6.6	3.7	3.9	13.7	5.9	FD	3.2	2.8	2.4	FD		5.2	73.3	11	6.7
Emerald	7			3.0	1.0	FD		FD	FD							4.0	2	2.0
Fragrant Cloud	8			9.4	7.3	4.0	FD	11.8	FD	7.2	8.5		6.0		6.0	60.1	8	7.5
First Red	9		1.0	8.8	3.4	3.9	FD	3.5	FD	5.4	4.8	3.3	10.0	FD	6.2	50.2	10	5.0
Frisco	10	FD		6.1	FD	8.0	FD		15.0	6.3	FD				1.7	37.2	5	7.4
Jade	11			32.3	3.8			11.0	FD	17.0	FD		12.0			76.1	5	15.2
Josephine Charlotte	12	FD		16.1	5.6	7.2		10.6		10.2	FD	8.0	FD		55.0	112.6	7	16.1
Kardinal	13		3.0	20.7	8.5	12.0		4.5		21.9			9.0		39.0	118.6	8	14.8
Naomi	14		12.0	7.0	7.0			FD	FD	23.0					FD	49.0	4	12.3
Osiana	15	FD	FD	24.1	15.6	9.5	16.5	36.8		32.4	9.8	20.2	12.2	8.4	16.8	202.3	11	18.4
Pink Noblesse	16	22.3	22.7	12.9	13.4	13.1		13.6	17.5	21.1	FD	36.8	14.0	24.0	11.3	222.7	12	18.6
Paris	17			12.8	1.5	3.0		10.3	FD	23.0		FD			FD	50.6	5	10.1
Raphaella	18			15.5	FD	15.0		FD	FD	15	FD	FD	FD		FD	45.5	3	15.2
Ravel	19			33.3	22.6	14.0		16.5		10.0			3.0		FD	99.4	6	16.6
Sundance	20			21.1	22.2	18.5	18.0	18.3		14.2	10.5		16.8		16.5	156.1	9	17.3
Saphir	21			26.9	13.7	21.0	FD	15.4	FD	15.3	4.0		13.4		12.8	122.4	8	15.3
Tineke	22	FD	5.0	22.4	15.8	22.4	12.7	19.7	8.0	33.6	FD	16.7	14.5		15.0	185.7	11	16.9
Top Secret	23			8.4	5.7	FD		11.0	FD	5.8	FD	FD	FD		31.0	61.9	5	12.4
Texas	24	9.6		16.0	32.7	34	10.0	9.3	FD	11.0	7.0		FD	FD	0.5	130.1	9	14.5
Vendela	25			14.1	7.5	4.7		2.7		19.2	FD	FD	32.0		7.0	87.1	7	12.4
Vivaldi	26	FD	36.5	15.1	16.5	14.4		12.8	FD	22.0	9.7	11.7	14.5		6.5	159.6	10	16.0
White Noblesse	27		FD	13.8	3.7	6.0		9.0		12.2	FD	FD			10.4	55.1	6	9.2
Sum.		74.1	108.7	430.3	254.7	258.9	70.8	266.4	48.5	399.5	63.0	107.4	214.1	36.9	302.5	2635.7	196	12.8
Count		5	8	26	24	22	5	22	4	25	10	8	15	3	19	196		
Av.		14.8	13.6	16.6	10.6	11.8	14.2	12.1	12.1	16.0	6.3	13.4	14.3	12.3	15.9	13.1		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse). FD = fruit drop

**Table 6** Pollination index (PI) on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	4.8		13.2	10.9	16.8		8.0	FD	14.7	0.3		20.8		14.0	103.7	9	11.5
Bridal Pink	2		FD	2.4	0.2	0.2		1.0	3.2	7.8		FD	FD		FD	14.8	6	2.5
Black Magic	3		FD	5.0	1.4	0.3		1.6	FD	9.6	FD		1.0		2.0	20.8	7	3.0
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	8.7	7.4	11.2	16.1	17.2		8.6	FD	12.7	1.0	2.6	8.9	1.5	7.3	103.2	12	8.6
Emblem	6	1.5	1.8	1.5	3.2	1.1	10.3	2.8	FD	2.3	0.6	1.9	FD		4.0	31.0	11	2.8
Emerald	7			0.1	0.3	FD		FD	FD							0.4	2	0.2
Fragrant Cloud	8			2.8	5.3	0.4	FD	4.3	FD	6.2	2.8		2.4		3.2	27.4	8	3.4
First Red	9		0.1	5.3	3.1	1.1	FD	2.6	FD	4.1	0.7	2.8	1.5	FD	5.0	26.3	10	2.6
Frisco	10	FD		0.5	FD	4.0		FD	10.0	1.2	FD				1.2	16.9	5	3.4
Jade	11			8.1	2.7			3.7	FD	5.7	FD		4.0			24.2	5	4.8
Josephine Charlotte	12	FD		3.6	4.5	4.0		1.5		3.6	FD	2.7	FD		2.4	22.3	7	3.2
Kardinal	13		1.5	11.5	6.5	4.0		0.8		5.9			2.6		13.0	45.8	8	5.7
Naomi	14		4.0	0.8	5.6			FD	FD	11.5					FD	21.9	4	5.5
Osiana	15	FD	FD	8.9	12.8	6.6	6.6	7.0		7.0	7.0	9.7	10.2	6.0	9.7	91.5	11	8.3
Pink Noblesse	16	13.4	13.6	8.3	13.2	10.7		6.8	8.8	15.4	FD	10.5	9.3	2.4	7.0	119.4	12	10.0
Paris	17			2.5	0.9	1.9		4.9	FD	14.9		FD			FD	25.1	5	5.0
Raphaella	18			0.4	FD	1.3		FD	FD	2.5	FD	FD	FD		FD	4.2	3	1.4
Ravel	19			2.6	9.4	4.7		11.0		5.0			1.0		FD	33.7	6	5.6
Sundance	20			6.0	8.5	2.2	2.3	10.0		10.6	7.0		11.2		11.0	68.8	9	7.6
Saphir	21			12.7	12.9	3.5	FD	8.6	FD	13.0	0.3		10.7		12.2	73.9	8	9.2
Tineke	22	FD	1.4	6.5	9.6	11.8	2.6	6.9	2.0	15.1	FD	6.3	7.9		8.5	78.6	11	7.1
Top Secret	23			1.0	1.4	FD		2.2	FD	4.4	FD		FD		15.5	24.5	5	4.9
Texas	24	6.0		0.7	7.5	9.7	2.0	4.3	FD	8.3	1.2		FD	FD	0.3	40.0	9	4.4
Vendela	25			1.3	4.3	0.6		1.3		14.7	FD	FD	10.7		0.5	33.4	7	4.8
Vivaldi	26	FD	10.4	3.5	13.9	8.2		9.1	FD	12.9	4.1	4.7	7.3		2.6	76.7	10	7.7
White Noblesse	27		FD	2.0	1.6	2.0		1.4		4.4	FD	FD			5.8	17.2	6	2.9
Sum.		34.4	40.2	122.4	155.8	112.3	23.8	108.4	24.0	213.5	25.0	41.2	109.5	9.9	125.2	1145.6	196	5.2
Count		5	8.0	26.0	24.0	22.0	5.0	22.0	4.0	25.0	10.0	8.0	15.0	3.0	19.0	196		
Av.		6.9	5.0	4.7	6.5	5.1	4.8	4.9	6.0	8.5	2.5	5.2	7.3	3.3	6.6	8.5		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse). FD = fruit drop

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**Table 7** Percentage of germination on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4*	5	6*	8	9*	13*	15*	16	21	22	24	26	Sum.	Count	Av.	%NG/Crosses
Azure Sea	1	61.5		46.4	40.5	16.7		29.4	FD	12.2	NG	FD	27.4		36.9	271.0	8	33.9	9.1
Bridal Pink	2		FD	13.3	NG	NG		NG	6.3	NG		FD			FD	19.5	2	9.8	44.4
Black Magic	3		FD	12.9	1.7	40.0		NG	FD	NG	FD		NG		NG	54.5	3	18.2	40.0
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-	0.0
Diplomat	5	9.8	24.3	42.5	28.8	16.1		26.2	FD	14.7	NG	22.0	25.4	NG	23.5	233.4	10	23.3	15.4
Emblem	6	31.3	NG	50.3	25.7	10.5	29.3	17.1	FD	NG	NG	NG	FD		11.1	175.2	7	25.0	30.8
Emerald	7			NG	NG	FD		FD	FD							-	-	-	40.0
Fragrant Cloud	8			14.1	11.4	NG	FD	56.4	FD	0.6	2.8		16.7		54.8	156.8	7	22.4	10.0
First Red	9		NG	17.6	1.9	NG	FD	2.4	FD	NG	21.1	NG	NG	FD	5.2	48.1	5	9.6	38.5
Frisco	10	FD		9.3	FD	NG		FD	NG	NG	FD				25.0	34.3	2	17.2	33.3
Jade	11			19.7	NG			NG	FD	NG	FD		NG			19.7	1	19.7	57.1
Josephine Charlotte	12	FD		29.9	NG	NG		20.8		NG	FD	12.5	FD		20.0	83.2	4	20.8	30.0
Kardinal	13		NG	23.3	NG	NG		NG		NG			5.6		2.6	31.5	3	10.5	62.5
Naomi	14		16.7	15.4	NG			D	FD	NG					FD	32.1	2	16.0	28.6
Osiana	15	FD	FD	10.3	11.1	NG	9.1	13.7		17.3	NG	2.2	1.0	2.4	3.4	70.5	9	7.8	15.4
Pink Noblesse	16	17.9	NG	48.4	5.6	21.5		8.6	14.3	1.8	FD	NG	1.2	NG	1.2	120.4	9	13.4	23.1
Paris	17			35.6	NG	NG		NG	FD	NG		FD			FD	35.6	1	35.6	50.0
Raphaella	18			NG	FD	NG		FD	FD	NG	FD	FD	FD		FD	-	-	-	30.0
Ravel	19			55.3	9.7	NG		NG		NG			NG		FD	65.0	2	32.5	57.1
Sundance	20			4.1	6.3	NG	11.1	0.9		NG	NG		14.9		1.5	38.9	6	6.5	33.3
Saphir	21			44.3	51.8	8.0	FD	34.1	FD	18.2	NG		18.5		8.7	183.6	7	26.2	10.0
Tineke	22	FD	NG	38.8	41.2	18.3	NG	33.9	37.5	18.6	FD	4.0	33.3		21.8	247.5	9	27.5	15.4
Top Secret	23			23.9	NG	FD		NG	FD	NG	FD		FD		NG	23.9	1	23.9	44.4
Texas	24	2.1		28.1	2.5	0.6	NG	1.8	FD	NG	NG		FD	FD	NG	35.1	5	7.0	33.3
Vendela	25			15.2	NG	25.0		NG		NG	FD	FD	NG		NS	40.2	2	20.1	44.4
Vivaldi	26	FD	NS	11.4	1.2	13.3		8.2	FD	0.9	NG	29.5	NS		38.5	103.0	7	14.7	8.3
White Noblesse	27		FD	55.8	5.1	33.3		51.9		6.6	FD	FD			19.2	171.9	6	28.6	0.0
Sum.		122.6	41.0	665.9	244.6	203.3	49.5	305.2	58.0	90.8	23.9	70.3	144.0	2.4	273.3	2294.8	118	19.6	29.8
Count		5	2	24	15	11	3	14	3	9	2	5	9	1	15	118			
Av.		24.5	20.5	27.7	16.3	18.5	16.5	21.8	19.3	10.1	11.9	14.1	16.0	2.4	18.2	17.0			
%NG/Crosses		0.0	41.7	7.4	33.3	44.0	25.0	29.6	5.0	61.5	38.1	21.4	23.8	40.0	12.0	27.4			

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse).

FD = fruit drop; NG=seeds not germinated; NS=seeds not sown



**Table 8** Number of germinated plants per cross on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4	5	6	8	9	13	15	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	8		264	83	6		40	FD	5	NG		34		31	471.0	8	58.9
Bridal Pink	2		FD	19	NG	NG		NG	1	NG		FD	FD		FD	20.0	2	10.0
Black Magic	3		FD	105	1	4		NG	FD	NG	FD		NG		NG	110.0	3	36.7
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	6	9	753	241	227		151	FD	262	NG	13	45	NG	31	1738.0	10	173.8
Emblem	6	10	NG	89	52	2	12	35	FD	NG	NG	NG	FD		32	232.0	7	33.1
Emerald	7			NG	NG	FD		FD	FD							-	-	-
Fragrant Cloud	8			36	8	NG	FD	53	FD	1	3		2		23	126.0	7	18.0
First Red	9		NG	79	3	NG	FD	1	FD	NG	4	NG	NG	FD	9	96.0	5	19.2
Frisco	10	FD		4	FD	NG		FD	NG	NG	FD				3	7.0	2	3.5
Jade	11			25	NG			NG	FD	NG	FD		NG			25.0	1	25.0
Josephine Charlotte	12	FD		100	NG	NG		11	NG	FD	1	FD			11	123.0	4	30.8
Kardinal	13		NG	102	NG	NG		NG	NG				1		1	104.0	3	34.7
Naomi	14			2	NG			FD	FD	NG					FD	4.0	2	2.0
Osiana	15	FD	FD	147	126	NG	3	87		28	NG	5	4	1	15	416.0	9	46.2
Pink Noblesse	16	12	NG	510	105	138		55	10	13	FD	NG	4	NG	3	850.0	9	94.4
Paris	17			64	NG	NG		NG	FD	NG		FD			FD	64.0	1	64.0
Raphaella	18			NG	FD	NG		FD	FD	NG	FD	FD	FD		FD	-	-	-
Ravel	19			47	11	NG		NG		NG			NG		FD	58.0	2	29.0
Sundance	20			7	7	NG	2	1		NG	NG		10		1	28.0	6	4.7
Saphir	21			639	253	14	FD	136	FD	68	NG		12		35	1157.0	7	165.3
Tineke	22	FD	NG	303	150	113	NG	147	6	360	FD	2	24		100	1205.0	9	133.9
Top Secret	23			22	NG	FD		NG	FD	NG	FD		FD		NG	22.0	1	22.0
Texas	24	1		9	5	1	NG	1	FD	NG	NG		FD	FD	NG	17.0	5	3.4
Vendela	25			23	NG	2		NG		NG	FD	FD	NG		NS	25.0	2	12.5
Vivaldi	26	FD	NS	54	1	4		22	FD	13	NG	18	NS		10	122.0	7	17.4
White Noblesse	27		FD	77	3	4		14		4	FD	FD			10	112.0	6	18.7
Sum.		37.0	11.0	3480.0	1049.0	515.0	17.0	754.0	17.0	754.0	7.0	39.0	136.0	1.0	315.0	7132.0	118	44.0
Count		5	2	24	15	11	3	14	3	9	2	5	9	1	15	118		
Av.		7.4	5.5	145.0	69.9	46.8	5.7	53.9	5.7	83.8	3.5	7.8	15.1	1.0	21.0	33.7		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse).

FD = fruit drop; NG=seeds not germinated; NS=seeds not sown

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**Table 9** Pollination efficiency (PE) on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4	5	6	8	9	13	15	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	1.33		3.57	2.86	1.20		2.35	FD	0.12	NG		2.83		5.17	19.44	8	2.43
Bridal Pink	2		FD	0.32	NG	NG		NG	0.20	NG		FD	FD		FD	0.52	2	0.26
Black Magic	3		FD	0.64	0.02	0.10		NG	FD	NG	FD		NG		NG	0.76	3	0.25
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	0.86	1.80	4.77	4.63	2.77		2.25	FD	1.87	NG	0.57	2.25	NG	1.72	23.49	10	2.35
Emblem	6	0.48	NG	0.49	0.81	0.08	3.00	0.46	FD	NG	NG	NG	FD		0.44	5.76	7	0.82
Emerald	7			NG	NG	FD		FD	FD							0.00	0	0.00
Fragrant Cloud	8			0.38	0.53	NG	FD	2.41	FD	0.03	0.50		0.40		1.77	6.02	7	0.86
First Red	9		NG	0.41	0.05	NG	FD	0.06	FD	NG	0.15	NG	NG	FD	0.26	0.93	5	0.19
Frisco	10	FD		0.05	FD	NG		FD	NG	NG	FD				0.30	0.35	2	0.18
Jade	11			1.56	NG			NG	FD	NG	FD		NG			1.56	1	1.56
Josephine Charlotte	12	FD		0.83	NG	NG		0.31	NG	FD		0.33	FD		0.48	1.95	4	0.49
Kardinal	13		NG	2.17	NG	NG		NG	NG	NG			0.14		0.33	2.64	3	0.88
Naomi	14		0.67	0.11	NG			FD	FD	NG					FD	0.78	2	0.39
Osiana	15	FD	FD	0.92	0.98	NG	0.60	0.83		1.22	NG	0.19	0.11	0.14	0.33	5.32	9	0.59
Pink Noblesse	16	2.40	NG	2.70	0.74	2.30		0.59	1.25	0.27	FD	NG	0.11	NG	0.08	10.44	9	1.16
Paris	17			0.65	NG	NG		NG	FD	NG		FD			FD	0.65	1	0.65
Raphaella	18			NG	FD	NG		FD	FD	NG	FD	FD	FD		FD	-	-	-
Ravel	19			1.21	0.92	NG		NG		NG			NG		FD	2.13	2	1.07
Sundance	20			0.25	0.54	NG	0.25	0.09		NG	NG		1.67		0.17	2.97	6	0.50
Saphir	21			4.20	2.66	0.18	FD	2.72	FD	0.68	NG		0.60		0.85	11.89	7	1.70
Tineke	22	FD	NG	2.20	2.94	1.85	NG	2.33	0.75	2.13	FD	0.25	2.18		0.93	15.56	9	1.73
Top Secret	23			0.23	NG	FD		NG	FD	NG	FD		FD		NG	0.23	1	0.23
Texas	24	0.13		0.18	0.38	0.14	NG	0.08	FD	NG	NG		FD	FD	NG	0.91	5	0.18
Vendela	25			0.19	NG	0.09		NG		NG	FD	FD	NG		NS	0.28	2	0.14
Vivaldi	26	FD	NS	0.37	0.08	0.29		0.71	FD	0.15	NG	1.20	NS		1.00	3.80	7	0.54
White Noblesse	27		FD	1.10	0.08	0.67		0.74		0.29	FD	FD			1.11	3.99	6	0.67
Sum.		5.20	2.47	29.50	18.22	9.67	3.85	15.93	2.20	6.76	0.65	2.54	10.29	0.14	14.94	122.4	118	0.79
Count		5	2	24	15	11	3	14	3	9	2	5	9	1	15	118		
Av.		1.04	1.24	1.23	1.21	0.88	1.28	1.14	0.73	0.75	0.33	0.51	1.14	0.14	1.00	0.90		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse).

FD = fruit drop; NG=seeds not germinated; NS=seeds not sown

**Table 10** Number of healthy plants per cross on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4	5	6	8	9	13	15	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	5		240	75	5		30	FD	3	NG		25		25	408.0	8	33.9
Bridal Pink	2		FD	15	NG	NG		NG	1	NG		FD	FD		FD	16.0	2	9.8
Black Magic	3		FD	90	1	3		NG	FD	NG	FD		NG		NG	94.0	3	18.2
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	5	8	650	200	210		140	FD	250	NG	10	40	NG	30	1543.0	10	23.3
Emblem	6	10	NG	85	50	2	10	30	FD	NG	NG	N	FD		30	217.0	7	25.0
Emerald	7			NG	NG	FD		FD	FD							-	-	-
Fragrant Cloud	8			30	5	NG		FD	45	FD	1	3			20	106.0	7	22.4
First Red	9		NG	70	3	NG		FD	1	FD	NG	4	N	NG	FD	83.0	5	9.6
Frisco	10	FD		4	FD	NG		FD	NG	NG	NG				3	7.0	2	17.2
Jade	11			20	NG			NG	FD	NG	NG		NG			20.0	1	19.7
Josephine Charlotte	12	FD		75	NG	NG		10	NG	NG		1	FD		10	96.0	4	20.8
Kardinal	13		NG	75	NG	NG		NG	NG	NG			1		1	77.0	3	10.5
Naomi	14		2	2	NG			FD	FD	NG					FD	4.0	2	16.0
Osiana	15	FD	FD	120	97	NG	1	80		22	NG	5	4	1	15	345.0	9	7.8
Pink Noblesse	16	10	NG	500	100	120		50	10	10	FD	N	4	NG	3	807.0	9	13.4
ris	17			50	NG	NG		NG	FD	NG		FD			FD	50.0	1	35.6
Raphaella	18			NG	FD	NG		FD	FD	NG	FD	FD	FD		FD	-	-	-
Ravel	19			30	10	NG		NG		NG			NG		FD	40.0	2	32.5
Sundance	20			5	5	NG	2	1		NG	NG		10		1	24.0	6	6.5
Saphir	21			500	250	10	D	100	FD	50	NG		10		30	950.0	7	26.2
Tineke	22	FD	NG	300	120	100	NG	120	6	300	FD	2	20		80	1048.0	9	27.5
Top Secret	23			22	NG	FD		NG	FD	NG	FD		FD		NG	22.0	1	23.9
Texas	24	1		9	5	1	NG	1	FD	NG	NG		FD	FD	NG	17.0	5	7.0
Vendela	25			20	NG	2		NG		NG	FD	FD	NG		NS	22.0	2	20.1
Vivaldi	26	FD	NS	50	1	4		20	FD	10	NG	10	NS		10	105.0	7	14.7
White Noblesse	27		FD	70	3	4		10		4	FD	FD			10	101.0	6	28.6
Sum.		31.0	10.0	3032.0	925.0	461.0	13.0	638.0	17.0	650.0	7.0	28.0	116.0	1.0	273.0	6202.0	118	37.7
Count		5	2	24	15	11	3	14	3	9	2	5	9	1	15	118		
Av.		6.2	5.0	126.3	61.7	41.9	4.3	45.6	5.7	72.2	3.5	5.6	12.9	1.0	18.2	29.3		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse).

FD = fruit drop; NG=seeds not germinated; NS=seeds not sown

**Table 11** Percentage of healthy plants on diallel crossing scheme of 27 HT rose varieties

Female/Male	Code	1	3	4	5	6	8	9	13	15	16	21	22	24	26	Sum.	Count	Av.
Azure Sea	1	62.5		90.9	90.4	83.3		75.0	FD	60.0	NG		73.5		80.6	616.3	8	77.0
Bridal Pink	2		FD	78.9	NG	NG		NG	100.0	NG		FD	FD		FD	178.9	2	89.5
Black Magic	3		FD	85.7	100.0	75.0		NG	FD	NG	FD		NG		NG	260.7	3	86.9
Dallas	4			FD	FD	FD		FD	FD	FD	FD		FD		FD	-	-	-
Diplomat	5	83.3	88.9	86.3	83.0	92.5		92.7	FD	95.4	NG	76.9	88.9	NG	96.8	884.8	10	88.5
Emblem	6	100.0	NG	95.5	96.2	100.0	83.3	85.7	FD	NG	NG	NG	FD		93.8	654.5	7	93.5
Emerald	7			NG	NG	FD		FD	FD							-	-	-
Fragrant Cloud	8			83.3	62.5	NG	FD	84.9	FD	100.0	100.0		100.0		87.0	617.7	7	88.2
First Red	9		NG	88.6	100.0	NG	FD	100.0	FD	NG	100.0	NG	NG	FD	55.6	444.2	5	88.8
Frisco	10	FD		100.0	FD	NG		FD	NG	NG	FD				100.0	200.0	2	100.0
Jade	11			80.0	NG			NG	FD	NG	FD		NG			80.0	1	80.0
Josephine Charlotte	12	FD		75.0	NG	NG		90.9		NG	FD	100.0	FD		90.9	356.8	4	89.2
Kardinal	13		NG	73.5	NG	NG		NG		NG			100.0		100.0	273.5	3	91.2
Naomi	14		100.0	100.0	NG			FD	FD	NG						200.0	2	100.0
Osiana	15	FD	FD	81.6	77.0	NG	33.3	92.0		78.6	NG	100.0	100.0	100.0	100.0	762.5	9	84.7
Pink Noblesse	16	83.3	NG	98.0	95.2	87.0		90.9	100.0	76.9	FD	NG	100.0	NG	100.0	831.4	9	92.4
Paris	17			78.1	NG	NG		NG	FD	NG		FD			FD	78.1	1	78.1
Raphaella	18			NG	FD	NG		FD	FD	NG	FD	FD	FD		FD	-	-	-
Ravel	19			63.8	90.9	NG		NG		NG			NG		FD	154.7	2	77.4
Sundance	20			71.4	71.4	NG	100.0	100.0		NG	NG		100.0		100.0	542.9	6	90.5
Saphir	21			78.2	98.8	71.4	FD	73.5	FD	73.5	NG		83.3		85.7	564.6	7	80.7
Tineke	22	FD	NG	99.0	80.0	88.5	NG	81.6	100.0	83.3	FD	100.0	83.3		80.0	795.8	9	88.4
Top Secret	23			100.0	NG	FD		NG	FD	NG	FD		FD		NG	100.0	1	100.0
Texas	24	100.0		100.0	100.0	100.0	NG	100.0	FD	NG	NG		FD	FD	NG	500.0	5	100.0
Vendela	25			87.0	NG	100.0		NG		NG	FD	FD	NG		NS	187.0	2	93.5
Vivaldi	26	FD	NS	92.6	100.0	100.0		90.9	FD	76.9	NG	55.6	NS		100.0	616.0	7	88.0
White Noblesse	27		FD	90.9	100.0	100.0		71.4		100.0	FD	FD			100.0	562.3	6	93.7
Sum.		429.2	188.9	2078.6	1345.4	997.7	216.7	1229.6	300.0	744.7	200.0	432.5	829.1	100.0	1370.3	10462.6	118	89.2
Count		5	2	24	15	11	3	14	3	9	2	5	9	1	15	118		
Av.		85.8	94.4	86.6	89.7	90.7	72.2	87.8	100.0	82.7	100.0	86.5	92.1	100.0	91.4	90.0		

Note: Pollen from parents nos. 2, 7, 10, 11, 12, 14, 17, 18, 19, 20, 23 and 25 could not be used as pollen parent because of insufficient number of plants or insufficient amount of pollen released. In some cases, \*pollen parents nos. 4, 6, 9 and 13 were used for hybridization from outer source (farmer's greenhouse).

FD = fruit drop; NG=seeds not germinated; NS=seeds not sown

## APPENDIX B

### Characteristics of new rose

To establish a uniform way of describing varieties worldwide by using CPVO and UPVO guideline. The characteristics were observed or measured. On the basis of the guideline mentioned, a variety description of the new varieties was prepared and presented in Figure AppendixB-1 and Table AppendixB-1



**Figure 1** Photo for a patent varieties type list: 1.young shoot; 2. bud before the sepals open; 3. bud when the sepals open; 4. bud when the petals open; 5. flower in bloom; 6. top of flower in bloom; 7.underside of flower in bloom; 8. top of flower end of bloom; 9.bottom of flower end of bloom; 10. receptacle: stamens and pistils; 11. receptacle: pistils; 12. floral stem; 13.principal branch; 14.3 folioles: front and back; 15.undersides of folioles; 16. 7 tops of folioles.

**Table 1** Characterization of two selected offspring based on 42 traits of CPVO and UPVO list of explanation guideline for roses TG/11/7

CPVO N <sup>o</sup>	UPVO N <sup>o</sup>	Characteristics	04-301	04-116
1.	1.	Plant: growth habit	narrow bushy	narrow bushy
2.	2.	Plant: height (as for 1)	medium	medium
3.	3.	Plant: width	narrow	narrow
4.	4.	Young shoot: anthocyanin colouration (shoot about 20 cm long)	medium	medium
5.	5.	Young shoot: hue of anthocyanin colouration (as for 4)	bronze to reddish brown	reddish brown
6.	6.	Prickles	present	present
7.	7.	Prickles: shape of flower side	deep concave	concave
8.	8.	Short prickles: number	absent or very few	few
9.	9.	Long prickles: number	medium	medium
10.	10.	Leaf: size	medium	very large
11.	11.	Leaf: green colour (at first flowering)	medium	medium
12.	12.	Leaflet: glossiness of upper side	medium	absent or very weak
13.	13.	Leaflet: cross section	flat	slight convex
14.	14.	Leaflet: undulation of margin	medium	medium
15.	15.	Terminal leaflet: length of blade	medium	long
16.	16.	Terminal leaflet: width of blade	medium	broad
17.	17.	Terminal leaflet: shape of blade	obtuse	rounded
18.	18.	Flowering shoot: number of flowers	medium	medium
19.	19.	Flower pedicel: number of hair or prickles	few	few
20.	20.	Flower bud: shape of longitudinal section (just before separation of sepals)	ovate	ovate
21.	21.	Flower: type	double	double
22.	22.	Semi-double or double variety only: flower: number of petals	many	many
23.	23.	Flower: diameter	medium	large
24.	24.	Flower: view from above	irregularly rounded	star-shaped
25.	25.	Flower: side view of upper part (fully opened flower)	flattened convex	convex
26.	26.	Flower: side view of lower part (as for 25)	concave	flattened convex
27.	27.	Flower: fragrance	absent or very weak	absent or very weak
28.	28.	Sepal: extensions	weak	weak
29.	29.	Petal: size	medium	medium
30.	30.	Petal: colour of middle zone of inner side	R53C	RPN57A
31.	31.	Petal: colour of marginal zone of inner side	R53B	RPN57C
32.	32.	Petal: spot at base of inner side	present	present
33.	33.	Petal: size of spot at base of inner side	very small	very small
34.	34.	Petal: colour of spot at base of inner side	W155A	W155A
35.	35.	Petal: colour of middle zone of outer side	R53D	RPN57C
36.	36.	Petal: colour of marginal zone of outer side	R53D	RPN57C
37.	37.	Petal: spot at base of outer side	present	present
38.	38.	Petal: size of spot at base of outer side	small	very small
39.	39.	Petal: colour of spot at base of outer side	W155A	W155A
40.	40.	Petal: reflexing of margin	medium	strong
41.	41.	Petal: undulation of margin	absent or very weak	absent or very weak
42.	42.	Outer stamen: predominant colour of filament	white	yellow

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