



TWC/34/30

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

Thirty-Fourth Session Shanghai, China, June 7 to 10, 2016

A RING-TEST COMPARING THREE DIFFERENT SOFTWARE PACKAGES FOR COYD

Document prepared by an expert from China

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The Annex to this document contains a copy of a presentation on "A ring-test comparing three different software packages for COYD" that will be made at the thirty-fourth session of the Technical Working Party on Automation and Computer Programs (TWC).

Abbreviations:

CAAS Chinese Academy of Agricultural Sciences
GB The United Kingdom
CN China
DE Germany

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[Annex follows]



A ring-test comparing three different software packages for COYD

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Shanghai, China, June 7-10, 2016



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- Data used for COYD
- Statistical Tools
- Results



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Data used for COYD

- 45 varieties of Sorghum with two cycles, last five are candidate varieties:
- ✓ **Time of anthesis**, one datum for each cycle
- ✓ **Plant length**, twenty data for each cycle



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	varietal number	cycle 1	cycle 2		varietal number	cycle 1	cycle 2
	C01	61	61		C01	152.35	144.6
	C02	64	65		C02	152.9	145.85
	C03	64	65		C03	150.2	142.85
	C04	64	65		C04	155.8	150.4
	C05	66	67		C05	152.85	141.15
	C06	66	67		C06	145	152.05
	C07	66	67		C07	145.45	155.75
	C08	61	61		C08	162.15	150.6
	C09	64	60		C09	155.85	128.05
	C10	67	61		C10	157.7	143.1
	C11	68	69		C11	158.8	122.9
	C12	69	69		C12	188.6	150.85
	C13	63	64		C13	151.3	158.25
	C14	63	63		C14	148.6	123.1
	C15	60	61		C15	161.2	152.05
	C16	63	64		C16	137.1	121.9
	C17	61	61		C17	160.35	128.85
	C18	60	60		C18	149.5	150.5
	C19	64	68		C19	115.3	114.7
	C20	68	69		C20	137.1	128.25
	C21	69	69		C21	157.8	143.7
	C22	65	65		C22	176.6	155.25
	C23	63	63		C23	147.7	128.45
	C24	66	66		C24	144.2	129.4
	C25	68	67		C25	147.1	125.85
	C26	69	69		C26	146.85	120.4
	C27	61	63		C27	168	140.9
	C28	68	65		C28	143.85	123.4
	C29	68	67		C29	129.3	116.3
	C30	62	67		C30	158.4	150.85
	C31	61	68		C31	149.25	119.45
	C32	62	61		C32	150.1	125.6
	C33	60	66		C33	158.7	150.15
	C34	62	68		C34	166.9	133
	C35	61	62		C35	160.25	159.25
	C36	67	68		C36	146.9	136
	C37	64	61		C37	164.85	144.85
	C38	61	61		C38	159.4	159.5
	C39	61	62		C39	159.4	154.5
	C40	65	64		C40	92.55	81.4
	C41	65	66		C41	147.75	125.5

Time of anthesis (days)

Plant length (centimeter)



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Statistical tools

- DUST software, created by the United Kingdom (GB) in 1998, written by FORTRAN 90 language.
- SAS software, data collected by a Visual Basic (VB) software created by Germany (DE).
- DUSTC software, created by China in 2012, written by Pascal language in Delphi platform.



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DUSTN—GB



DUST (2012) Software
1. DUST Software is a part of the DUST System.
2. DUST Software is a part of the DUST System.
3. DUST Software is a part of the DUST System.
4. DUST Software is a part of the DUST System.
5. DUST Software is a part of the DUST System.

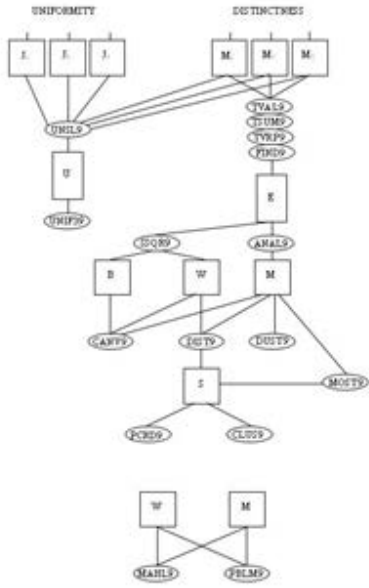


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(N) ANALYSIS FOR DISTINCTNESS AND UNIFORMITY



SUMMARY FOR C012 AT 1, ON LEVEL # USING REGR ADJ YORK S10**

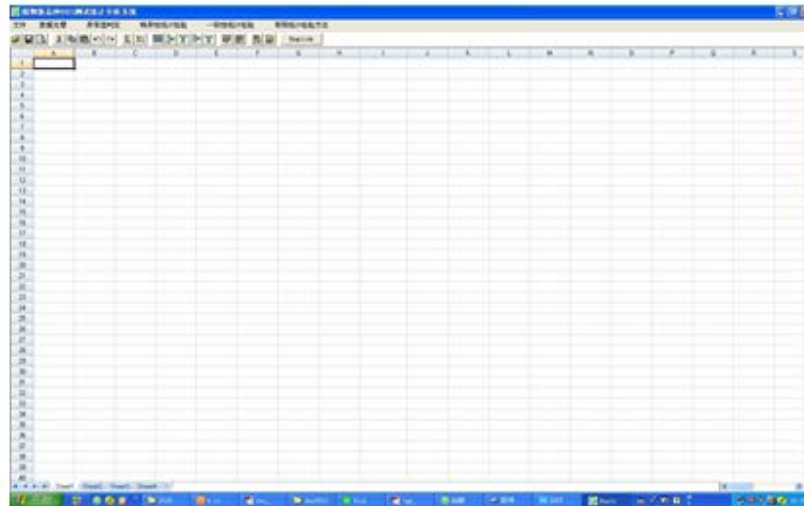
CANDIDATE VAR	27	30	39	40	41
1 001	80	80	80	2	80
2 002	80	80	80	2	80
3 003	80	80	80	2	80
4 004	2	2	80	2	80
5 005	80	80	80	2	80
6 006	80	80	80	2	80
7 007	80	80	80	2	80
8 008	80	80	80	2	80
9 009	2	2	80	2	80
10 010	80	80	80	2	80
11 011	2	2	80	2	80
12 012	80	80	80	2	80
13 013	80	80	80	2	80
14 014	2	80	80	2	80
15 015	80	80	80	2	80
16 016	2	2	2	2	80
17 017	80	80	80	2	80
18 018	80	80	80	2	80
19 019	2	2	2	2	2
20 020	2	2	80	2	80
21 021	80	80	80	2	80
22 022	80	80	2	2	2
23 023	2	80	80	2	80
24 024	2	80	80	2	80
25 025	2	80	80	2	80
26 026	2	80	80	2	80
27 027	80	80	80	2	80
28 028	2	80	80	2	80
29 029	2	2	2	2	80
30 030	80	80	80	2	80
31 031	2	80	80	2	80
32 032	2	80	80	2	80
33 033	80	80	80	2	80
34 034	80	80	80	2	80
35 035	80	80	80	2	80
36 036	80	80	80	2	80
37 037	-	80	80	2	80
38 038	80	-	80	2	80
39 039	80	80	-	2	80
40 040	2	2	2	2	2
41 041	2	80	80	2	-
NO OF NO VARS	23	30	35	0	33
DISTINCTNESS	80	80	80	2	80
CANDIDATE VAR	27	30	39	40	41



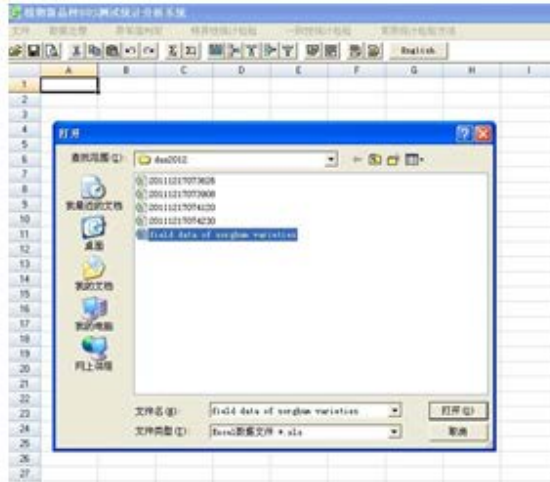
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DUSTC—CN



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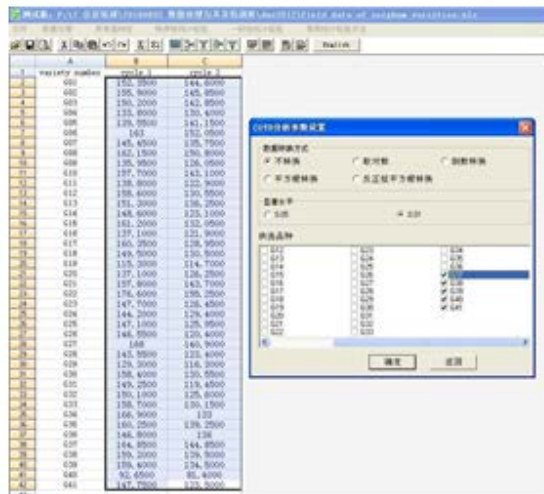


open an excel document with field data



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select data zone, click parameters board to select method to convert original data, significance level, candidate varieties



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Art	Prüfart	Jahr Anbauliste	Anzahl Jahre	2014 - 2016	frei
WD	Schanhorst	2016	3		

Prüfart	Sortiment	Prüfart	Sortiment	Prüfart	Sortiment	Prüfart	Sortiment	Prüfart	Sortiment
101	140 4750	3 3750	3 3750	-3 3750	-3 3750	3 3750	3 3750	3 3750	3 3750
102	150 4750	3 3750	-3 3750	-3 3750	-3 3750	3 3750	3 3750	3 3750	3 3750
103	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
104	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
105	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
106	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
107	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
108	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
109	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
110	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
111	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
112	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
113	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
114	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
115	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
116	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
117	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
118	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
119	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
120	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
121	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
122	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
123	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
124	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
125	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
126	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
127	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
128	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
129	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
130	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
131	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
132	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
133	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
134	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
135	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
136	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
137	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
138	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
139	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
140	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
141	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
142	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
143	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
144	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
145	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
146	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
147	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
148	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
149	140 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750
150	150 4750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750	3 3750

results will be showed in another sheet



SAS—DE

In the first step we choose species, trial-station and time-period

COY Daten entladen 1.06

Art: [WD] Prüfart: [Schanhorst] Jahr Anbauliste: [2016] Anzahl Jahre: [3] 2014 - 2016 frei

Jahre ändern Typ wählen

Sortiment bearbeiten Prüfarten bestimmen Merkmale bestimmen Protokolldatei einlesen Datei erstellen Programm beenden

In the second step we choose the candidate-varieties:

Prüfarten bestimmen

1xID 2016 Schanhorst

Prüfart	Jahr	Typ	Bezeichnung
2004	3	1	DUF LFD
2005	2	1	LP 0576
2005	1	1	LP 0586

Sortiment

Prüfart	Typ	Bezeichnung
2005	1	DUF LFD
2007	1	DUF LFD
2008	1	DUF LFD
2009	1	L2 LFD 1
2011	1	LMG LFD
2012	1	DUF LFD
2013	1	DUF LFD
2014	1	DUF LFD
2016	1	LP 0765
2017	1	LP 0765

OK Berechnen

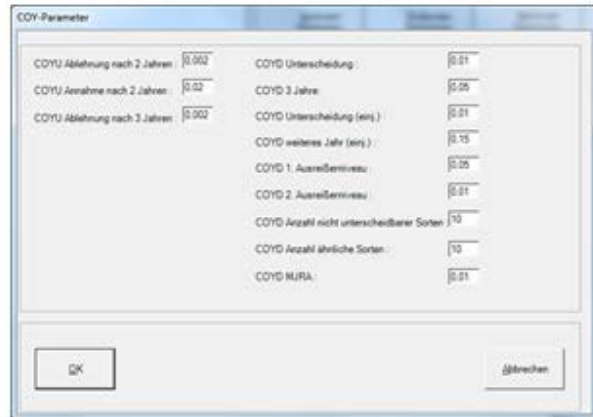




In the third step we choose the characteristics:



In the last step we choose the probability-levels:



Ken-Nr.	Sorte	37	38	39	40	41
1	Sorte 01	1J	NO	1J	2U	1J
2	Sorte 02	NO	NO	NO	2U	1J
3	Sorte 03	1U	1J	1J	2U	NO
4	Sorte 04	1U	1U	1J	2U	NO
5	Sorte 05	2J	NO	NO	2U	NO
6	Sorte 06	NO	NO	NO	2U	1U
7	Sorte 07	1J	NO	NO	2U	NO
8	Sorte 08	NO	NO	NO	2U	1U
9	Sorte 09	2U	1U	2J	2U	NO
10	Sorte 10	NO	NO	NO	2U	1J
11	Sorte 11	1U	1U	1J	2U	NO
12	Sorte 12	NO	NO	NO	2U	NO
13	Sorte 13	NO	NO	NO	2U	1J
14	Sorte 14	1U	1J	NO	2U	NO
15	Sorte 15	NO	NO	NO	2U	NO
16	Sorte 16	1U	1U	1U	2U	1J
17	Sorte 17	NO	NO	NO	2U	NO
18	Sorte 18	1J	NO	NO	2U	NO
19	Sorte 19	2U	1U	2U	2U	1U
20	Sorte 20	1U	1U	1J	2U	NO
21	Sorte 21	NO	NO	NO	2U	1J
22	Sorte 22	NO	1U	1U	2U	2U
23	Sorte 23	1U	NO	NO	2U	NO
24	Sorte 24	2U	2J	1U	2U	NO
25	Sorte 25	1U	1J	1J	2U	NO
26	Sorte 26	1U	1J	1J	2U	NO
27	Sorte 27	NO	NO	NO	2U	1U
28	Sorte 28	2U	2J	2J	2U	NO
29	Sorte 29	1U	1U	1U	2U	1J
30	Sorte 30	NO	NO	NO	2U	NO
31	Sorte 31	1U	1J	1J	2U	NO
32	Sorte 32	1U	NO	NO	2U	NO
33	Sorte 33	1J	NO	NO	2U	NO
34	Sorte 34	NO	NO	NO	2U	1J
35	Sorte 35	NO	NO	NO	2U	1J
36	Sorte 36	2J	NO	1J	2U	NO
37	Sorte 37	-	NO	NO	2U	1U
38	Sorte 38	NO	-	NO	2U	1J
39	Sorte 39	NO	NO	-	2U	NO
40	Sorte 40	2U	2U	2U	-	2U
41	Sorte 41	1U	1J	NO	2U	-
.	Anz. NU/3J	16	23	23	8	23
.	Unter./3J	nein	nein	nein	ja	nein

1J: further test year necessary in one characteristic (difference between test and candidate variety is lying between least significant difference for the first (1%) and for second (5%) limit)

2J: further test year necessary in two characteristics (difference between test and candidate variety is lying between least significant difference for the first (1%) and for second (5%) limit)

1U: there is a difference in one characteristic

2U: there is a difference in two characteristics

NU: there is no significant difference





Results

1% COYD criterion (LSD)	GB	CN	DE
Time of Anthesis	5.40	5.40	5.40
Plant Length	16.65	16.65	16.65

Perfect

- GB, CN and DE have the same result of criterion.
- DE produces a integrated result which is different from GB and CN.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Variation	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089
2	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017
3	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033	034
4	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051
5	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068
6	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085
7	086	087	088	089	090	091	092	093	094	095	096	097	098	099	100	101	102
8	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
9	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136
10	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153
11	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170
12	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187
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17	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272
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21	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
22	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357
23	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374
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25	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408
26	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425
27	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442
28	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459
29	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476
30	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493
31	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510
32	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527
33	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544
34	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561
35	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578
36	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595
37	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612
38	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629
39	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646
40	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663
41	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
42	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697
43	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714

Time of anthesis

Plant length





[End of Annex and of document]