

Nuevo método de determinación de pureza varietal mediante NGS

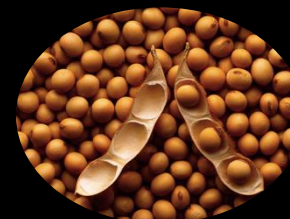
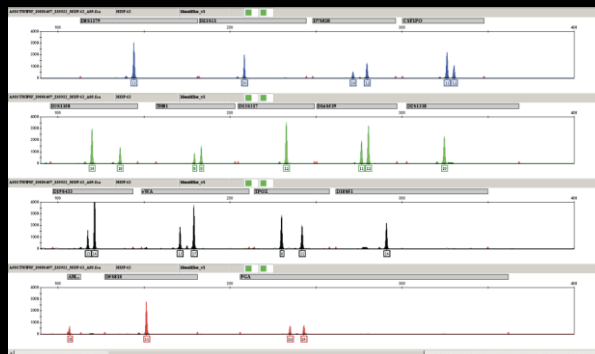
Carlos J. Azambuja
N. Grasso; B. Fonseca; A. Agorio;
R. Fossati.
Genia

Identidad mediante marcadores de ADN

Desde 1993



Paneles STRs



Crisis de cebada 2008

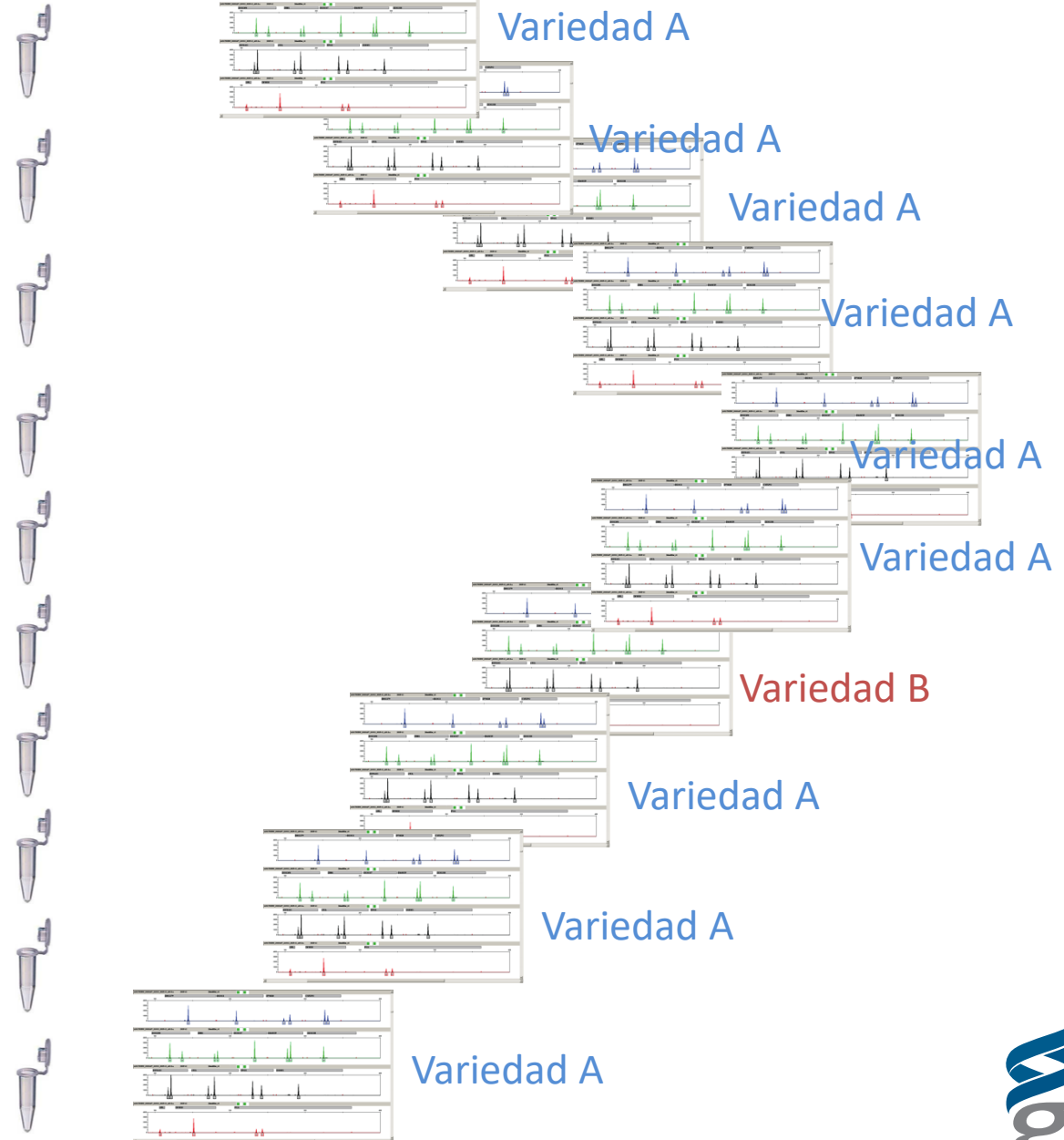
Necesitamos un sistema que detecte mezclas varietales !!!!



% semillas individuales

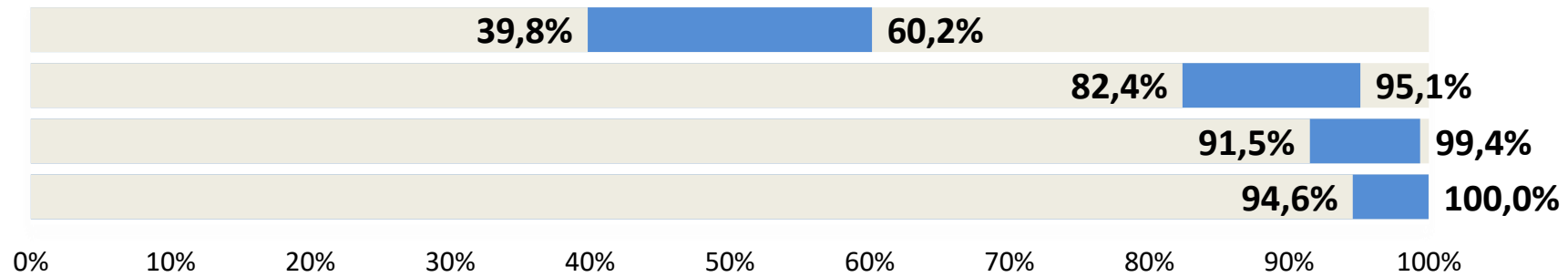


90 % de variedad A
10 % variedad B ????

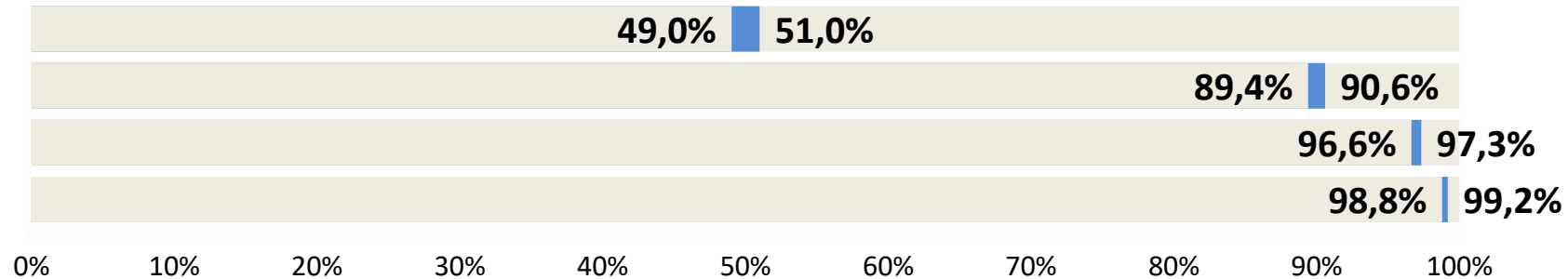


Error de muestreo

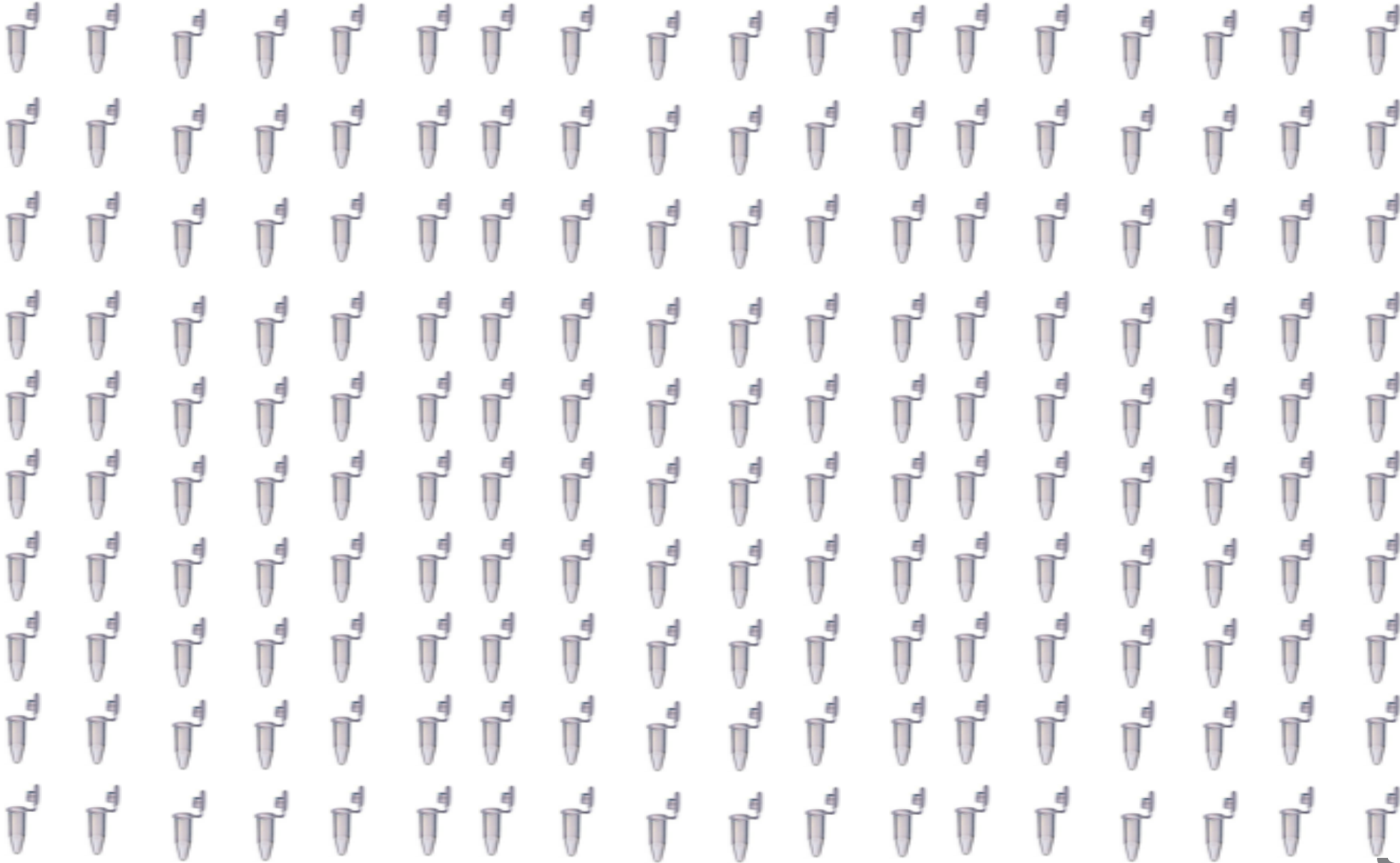
100 semillas



10 mil semillas

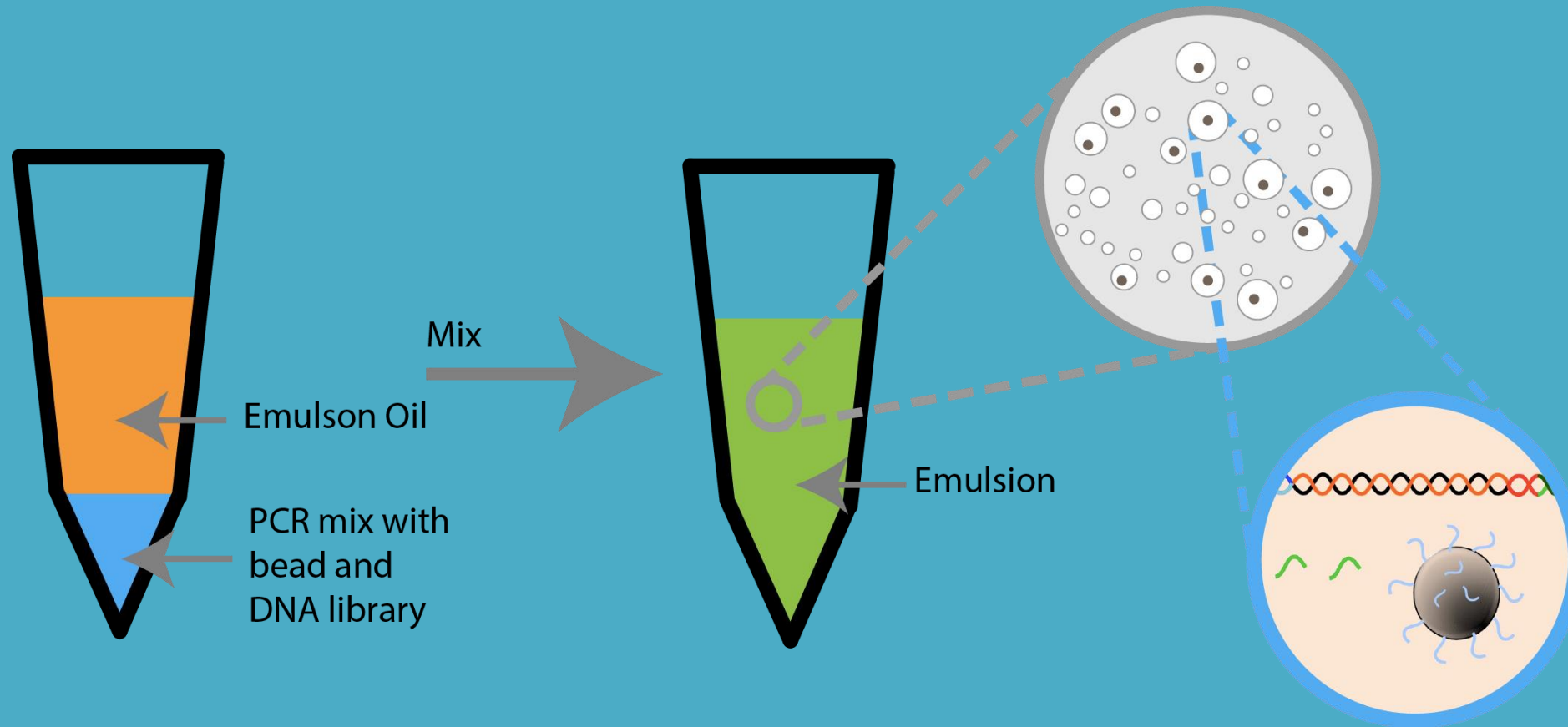


10 mil semillas = 10 mil tubos !!!!



Ion Torrent Technology

Emulsión 10 millones de reacciones

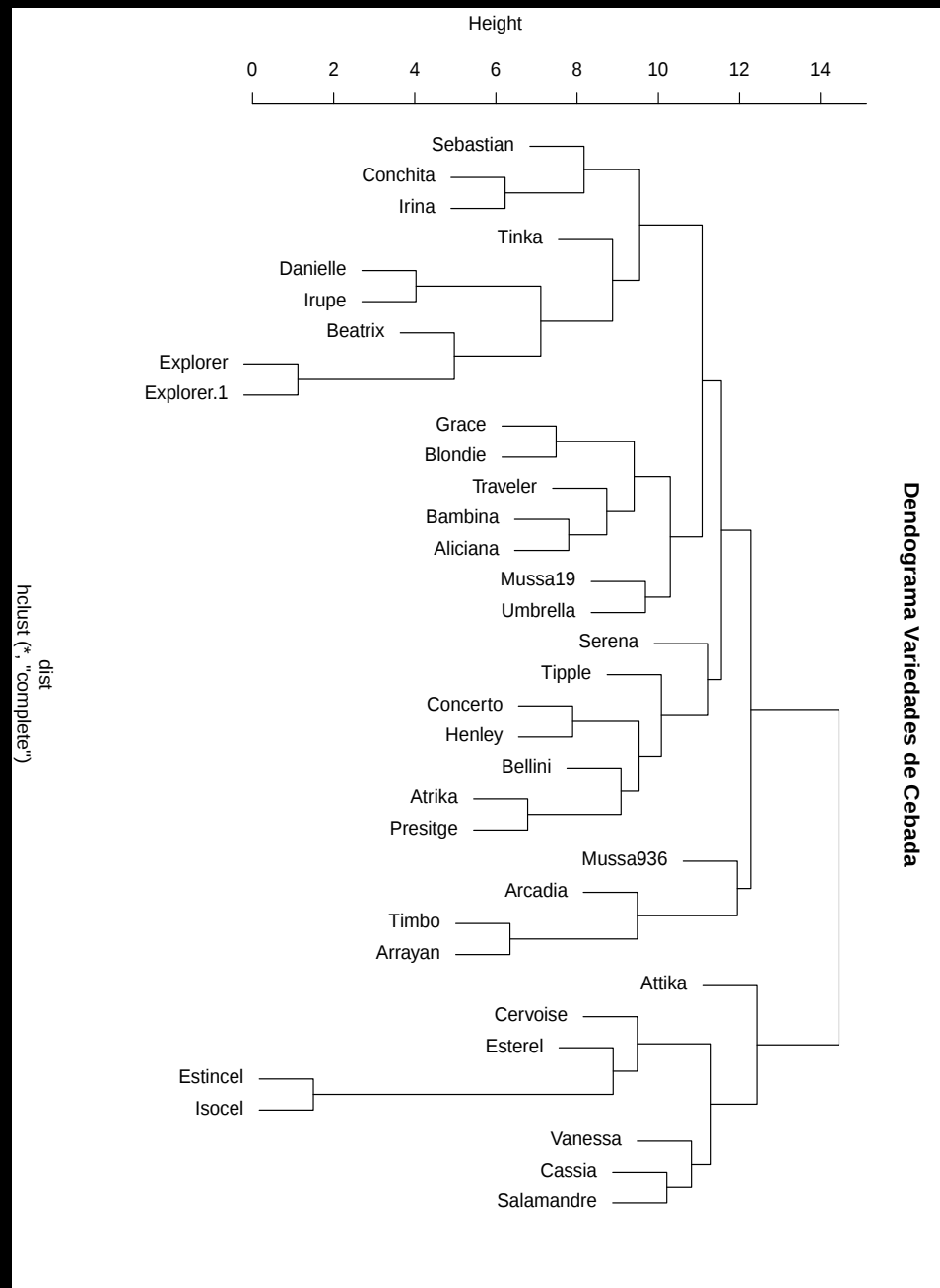


Panel de 400 SNPs con Agriseq de Thermo

Perfil Genético de la variedad Explorer

PERFIL GENÉTICO VARIEDAD DE CEBADA EXPLORER																																						
snpG1	snpG2	snpG3	snpG4	snpG5	snpG6	snpG7	snpG8	snpG9	snpG10	snpG11	snpG12	snpG13	snpG14	snpG15	snpG16	snpG17	snpG18	snpG19	snpG20	snpG21	snpG22	snpG23	snpG24	snpG25	snpG26	snpG27	snpG28	snpG29	snpG30									
T	T	T	T	C	A	T	G	T	G	G	C	C	C	C	T	C	G	G	G	A	G	C	C	C	C	T	A	G	A									
snpG31	snpG32	snpG33	snpG34	snpG35	snpG36	snpG37	snpG38	snpG39	snpG40	snpG41	snpG42	snpG43	snpG44	snpG45	snpG46	snpG47	snpG48	snpG49	snpG50	snpG51	snpG52	snpG53	snpG54	snpG55	snpG56	snpG57	snpG58	snpG59	snpG60									
G	G	C	T	G	C	G	A	G	G	G	C	C	A	C	T	T	T	C	C	C	G	C/T	A/G	G	C	T	T	T/C	C									
snpG61	snpG62	snpG63	snpG64	snpG65	snpG66	snpG67	snpG68	snpG69	snpG70	snpG71	snpG72	snpG73	snpG74	snpG75	snpG76	snpG77	snpG78	snpG79	snpG80	snpG81	snpG82	snpG83	snpG84	snpG85	snpG86	snpG87	snpG88	snpG89	snpG90									
C	C	G	C	G/A	C	T	C	T	T	T	A	C	G	C	T	A	G	G	T	A	G	C	A	A	G	G	C	T	G/A									
snpG91	snpG92	snpG93	snpG94	snpG95	snpG96	snpG97	snpG98	snpG99	snpG100	snpG101	snpG102	snpG103	snpG104	snpG105	snpG106	snpG107	snpG108	snpG109	snpG110	snpG111	snpG112	snpG113	snpG114	snpG115	snpG116	snpG117	snpG118	snpG119	snpG120									
C	T	T	C	C	G	A	C	C	G	G	C	G	T	C	G	A	T	T	G	C	T	T	G	A	T	G	C	T	C									
snpG121	snpG122	snpG123	snpG124	snpG125	snpG126	snpG127	snpG128	snpG129	snpG130	snpG131	snpG132	snpG133	snpG134	snpG135	snpG136	snpG137	snpG138	snpG139	snpG140	snpG141	snpG142	snpG143	snpG144	snpG145	snpG146	snpG147	snpG148	snpG149	snpG150									
T	A	G	A	C	G	G	G	C	T	G	C	C	T	T	C	C	T	T	C	C	T	A	T	A	G	G	G	C	C	C								
snpG151	snpG152	snpG153	snpG154	snpG155	snpG156	snpG157	snpG158	snpG159	snpG160	snpG161	snpG162	snpG163	snpG164	snpG165	snpG166	snpG167	snpG168	snpG169	snpG170	snpG171	snpG172	snpG173	snpG174	snpG175	snpG176	snpG177	snpG178	snpG179	snpG180									
T	G	A	C	G	A	A	C	C	A	G	T	G	A	G	A	G	T	C	G	G	T	T	C	G	G	C/A	C	T	A									
snpG181	snpG182	snpG183	snpG184	snpG185	snpG186	snpG187	snpG188	snpG189	snpG190	snpG191	snpG192	snpG193	snpG194	snpG195	snpG196	snpG197	snpG198	snpG199	snpG200	snpG201	snpG202	snpG203	snpG204	snpG205	snpG206	snpG207	snpG208	snpG209	snpG210									
T	G	T	C	T	G	A	G	C	G	G	A	A	T	G/C	G	G	A	C	C	C	G	C	A/G	T	C	A	C	T	C									
snpG211	snpG212	snpG213	snpG214	snpG215	snpG216	snpG217	snpG218	snpG219	snpG220	snpG221	snpG222	snpG223	snpG224	snpG225	snpG226	snpG227	snpG228	snpG229	snpG230	snpG231	snpG232	snpG233	snpG234	snpG235	snpG236	snpG237	snpG238	snpG239	snpG240									
G	C	A	C	A	T	A	G	T	G	A	T	G	T	T	A	G	T	T	G	C	A	G	T	C	G	A	C	G	A									
snpG241	snpG242	snpG243	snpG244	snpG245	snpG246	snpG247	snpG248	snpG249	snpG250	snpG251	snpG252	snpG253	snpG254	snpG255	snpG256	snpG257	snpG258	snpG259	snpG260	snpG261	snpG262	snpG263	snpG264	snpG265	snpG266	snpG267	snpG268	snpG269	snpG270									
G	G	G	A	C/T	T	C	A	G	C	T	A	T/C	G	A	T	G	C	A	C	A	A	A	A	C	T	C	T	A	A	G								
snpG271	snpG272	snpG273	snpG274	snpG275	snpG276	snpG277	snpG278	snpG279	snpG280	snpG281	snpG282	snpG283	snpG284	snpG285	snpG286	snpG287	snpG288	snpG289	snpG290	snpG291	snpG292	snpG293	snpG294	snpG295	snpG296	snpG297	snpG298	snpG299	snpG300									
G	A	C	C	G	G	C	T	C	G	C	C	A	C	A	A	A	A	G	C	C	G	C	G	A	A	C	G	A	T									
snpG301	snpG302	snpG303	snpG304	snpG305	snpG306	snpG307	snpG308	snpG309	snpG310	snpG311	snpG312	snpG313	snpG314	snpG315	snpG316	snpG317	snpG318	snpG319	snpG320	snpG321	snpG322	snpG323	snpG324	snpG325	snpG326	snpG327	snpG328	snpG329	snpG330									
C	A	T	G	G	G	G	C	G	A	A	G	T	G	T	T	C	G	T	G	A	C	C	G	G	G	T	A	G	C									
snpG331	snpG332	snpG333	snpG334	snpG335	snpG336	snpG337	snpG338	snpG339	snpG340	snpG341	snpG342	snpG343	snpG344	snpG345	snpG346	snpG347	snpG348	snpG349	snpG350	snpG351	snpG352	snpG353	snpG354	snpG355	snpG356	snpG357	snpG358											
G	A	C	C	C	G	A	A	T	T	T	A	C	G	G	G	T	C	A	C	C	C	G	C	A	G	T	G											

chr1	chr2	chr3	chr4	chr5	chr6	chr7	chr8	chr9	chr10	chr11	chr12	chr13	chr14	chr15	chr16	chr17	chr18	chr19	chr20	chr21	chr22	chr23	chr24	chr25	chr26	chr27	chr28	chr29	chr30	chr31	chr32	chr33	chr34	chr35	chr36	chr37	chr38	chr39	chr40	chr41	chr42	chr43	chr44	chr45	chr46	chr47	chr48	chr49	chr50	chr51	chr52	chr53	chr54	chr55	chr56	chr57	chr58	chr59	chr60	chr61	chr62	chr63	chr64	chr65	chr66	chr67	chr68	chr69	chr70	chr71	chr72	chr73	chr74	chr75	chr76	chr77	chr78	chr79	chr80	chr81	chr82	chr83	chr84	chr85	chr86	chr87	chr88	chr89	chr90	chr91	chr92	chr93	chr94	chr95	chr96	chr97	chr98	chr99	chr100	chr101	chr102	chr103	chr104	chr105	chr106	chr107	chr108	chr109	chr110	chr111	chr112	chr113	chr114	chr115	chr116	chr117	chr118	chr119	chr120	chr121	chr122	chr123	chr124	chr125	chr126	chr127	chr128	chr129	chr130	chr131	chr132	chr133	chr134	chr135	chr136	chr137	chr138	chr139	chr140	chr141	chr142	chr143	chr144	chr145	chr146	chr147	chr148	chr149	chr150	chr151	chr152	chr153	chr154	chr155	chr156	chr157	chr158	chr159	chr160	chr161	chr162	chr163	chr164	chr165	chr166	chr167	chr168	chr169	chr170	chr171	chr172	chr173	chr174	chr175	chr176	chr177	chr178	chr179	chr180	chr181	chr182	chr183	chr184	chr185	chr186	chr187	chr188	chr189	chr190	chr191	chr192	chr193	chr194	chr195	chr196	chr197	chr198	chr199	chr200	chr201	chr202	chr203	chr204	chr205	chr206	chr207	chr208	chr209	chr210	chr211	chr212	chr213	chr214	chr215	chr216	chr217	chr218	chr219	chr220	chr221	chr222	chr223	chr224	chr225	chr226	chr227	chr228	chr229	chr230	chr231	chr232	chr233	chr234	chr235	chr236	chr237	chr238	chr239	chr240	chr241	chr242	chr243	chr244	chr245	chr246	chr247	chr248	chr249	chr250	chr251	chr252	chr253	chr254	chr255	chr256	chr257	chr258	chr259	chr260	chr261	chr262	chr263	chr264	chr265	chr266	chr267	chr268	chr269	chr270	chr271	chr272	chr273	chr274	chr275	chr276	chr277	chr278	chr279	chr280	chr281	chr282	chr283	chr284	chr285	chr286	chr287	chr288	chr289	chr290	chr291	chr292	chr293	chr294	chr295	chr296	chr297	chr298	chr299	chr300	chr301	chr302	chr303	chr304	chr305	chr306	chr307	chr308	chr309	chr310	chr311	chr312	chr313	chr314	chr315	chr316	chr317	chr318	chr319	chr320	chr321	chr322	chr323	chr324	chr325	chr326	chr327	chr328	chr329	chr330	chr331	chr332	chr333	chr334	chr335	chr336	chr337	chr338	chr339	chr340	chr341	chr342	chr343	chr344	chr345	chr346	chr347	chr348	chr349	chr350	chr351	chr352	chr353	chr354	chr355	chr356	chr357	chr358	chr359	chr360	chr361	chr362	chr363	chr364	chr365	chr366	chr367	chr368	chr369	chr370	chr371	chr372	chr373	chr374	chr375	chr376	chr377	chr378	chr379	chr380	chr381	chr382	chr383	chr384	chr385	chr386	chr387	chr388	chr389	chr390	chr391	chr392	chr393	chr394	chr395	chr396	chr397	chr398	chr399	chr400	chr401	chr402	chr403	chr404	chr405	chr406	chr407	chr408	chr409	chr410	chr411	chr412	chr413	chr414	chr415	chr416	chr417	chr418	chr419	chr420	chr421	chr422	chr423	chr424	chr425	chr426	chr427	chr428	chr429	chr430	chr431	chr432	chr433	chr434	chr435	chr436	chr437	chr438	chr439	chr440	chr441	chr442	chr443	chr444	chr445	chr446	chr447	chr448	chr449	chr450	chr451	chr452	chr453	chr454	chr455	chr456	chr457	chr458	chr459	chr460	chr461	chr462	chr463	chr464	chr465	chr466	chr467
------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------



Soja

- Panel Agriseq de 400 SNPs a partir del panel de 6K
- Tipificamos 50 variedades
- Promedio de 80 SNPs diferenciales
- Panel de 11 SNPs permite discriminar las 50 variedades.

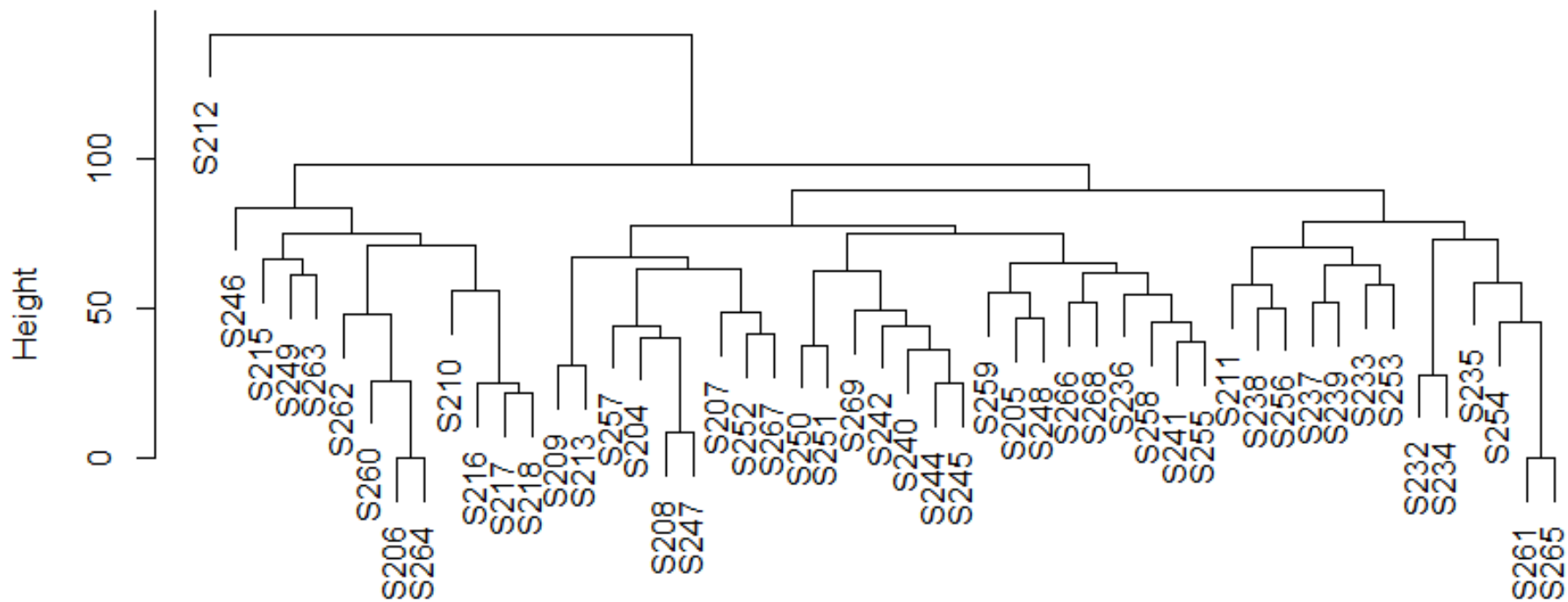
Panel de 11 SNPs que discrimina las 50 variedades

	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
--	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

5 SNPs diferenciales entre variedades

	S204	S205	S206	S207	S208	S209	S210	S211	S212	S213	S215	S216	S217	S218	S222	S233	S234	S235	S236	S237	S238	S239	S240	S241	S242	S244	S245	S246	S247	S248	S249	S250	S251	S252	S253	S254	S255	S256	S257	S258	S259	S260	S261	S262	S263	S266	S267	S268																																																																																																																																																																																																																																																																																																																																																							
S204	0	1	6	3	1	2	4	4	6	3	6	3	1	2	8	5	6	5	6	5	5	7	5	5	4	3	3	5	2	4	4	4	7	3	5	2	7	6	3	6	7	6	3	2	4	6	53																																																																																																																																																																																																																																																																																																																																																								
S205		0	4	3	3	1	3	4	2	2	3	2	1	2	5	6	3	4	3	3	2	5	5	6	3	4	5	3	3	2	4	3	6	5	4	3	4	4	2	5	4	2	2	2	5	5	55																																																																																																																																																																																																																																																																																																																																																								
S206			0				7	4	5	3	7	3	6	7	5	3	2	6	5	4	4	6	4	3	5	4	4	5	6	3	6	5	3	7	3	4	6	5	5	7	6	2	4	5	6	5	56																																																																																																																																																																																																																																																																																																																																																								
S207				0			7	7	3	8	6	5	3	2	3	8	6	7	5	8	9	7	7	4	6	1	4	4	2	1	3	5	4	4	8	6	7	8	2	6	5	5	7	5	5	5	23																																																																																																																																																																																																																																																																																																																																																								
S208					0		4	5	6	8	3	7	5	3	4	8	6	7	7	8	7	7	7	4	4	3	2	2	4	1	5	3	6	6	2	6	4	7	6	2	6	7	7	5	3	3	6	42																																																																																																																																																																																																																																																																																																																																																							
S209						0	7	4	6	1	5	5	3	3	6	6	4	5	6	4	5	7	6	8	7	5	6	6	5	5	3	6	10	4	4	4	5	4	4	6	7	6	3	4	5	6	85																																																																																																																																																																																																																																																																																																																																																								
S210							0	5	3	7	2	2	3	3	9	5	6	4	5	8	4	8	5	5	2	7	5	3	4	4	8	5	3	7	7	4	6	7	5	7	6	2	6	3	6	4	35																																																																																																																																																																																																																																																																																																																																																								
S211								0	4	4	4	5	5	4	6	4	3	3	4	4	3	7	4	4	7	6	4	8	7	5	7	6	6	6	4	1	3	2	8	4	9	6	5	2	5	2	5	2	84																																																																																																																																																																																																																																																																																																																																																						
S212									0	6	2	3	4	4	4	6	6	3	3	2	5	1	5	6	6	5	7	6	4	7	2	9	4	4	10	6	3	3	4	6	6	5	2	5	4	9	3	66																																																																																																																																																																																																																																																																																																																																																							
S213										0	5	5	4	4	4	5	6	4	5	6	5	5	5	5	6	6	4	4	4	4	5	2	7	8	3	5	4	3	2	3	5	5	6	3	3	4	4	64																																																																																																																																																																																																																																																																																																																																																							
S215											0	4	5	4	6	4	3	3	4	6	3	7	4	6	4	7	6	3	6	4	6	6	4	7	4	5	3	4	5	6	6	2	6	5	6	3	55																																																																																																																																																																																																																																																																																																																																																								
S216												0	1	9	5	6	2	5	8	4	6	7	7	4	7	5	3	4	2	8	3	5	7	9	3	6	7	4	5	7	4	3	4	3	8	4	36																																																																																																																																																																																																																																																																																																																																																								
S217													0	1	8	6	6	3	5	6	4	6	6	7	3	5	5	4	3	2	6	2	6	5	7	3	6	7	4	5	5	4	4	3	6	5	44																																																																																																																																																																																																																																																																																																																																																								
S218														0	6	3	4	2	5	5	4	4	5	5	3	4	4	4	4	1	4	1	4	3	5	3	5	6	5	3	3	2	2	3	4	4	25																																																																																																																																																																																																																																																																																																																																																								
S232															0	6	1	7	6	2	7	5	3	6	6	5	7	8	7	4	5	6	6	6	4	7	5	4	6	4	5	6	7	7	5	4	84																																																																																																																																																																																																																																																																																																																																																								
S233																	0	3	3	8	6	7	7	3	4	6	4	3	6	5	3	5	4	4	4	4	4	7	6	6	7	5	5	6	5	4	65																																																																																																																																																																																																																																																																																																																																																								
S234																		0	4	5	2	4	5	2	4	5	4	5	6	6	3	4	4	4	5	2	4	3	2	5	3	5	3	4	4	2	65																																																																																																																																																																																																																																																																																																																																																								
S235																			0	5	7	4	6	5	7	6	7	5	5	6	2	8	3	5	7	7	3	4	5	7	5	6	5	6	5	8	2	55																																																																																																																																																																																																																																																																																																																																																							
S236																				0	3	1	3	8	6	7	7	6	6	9	4	9	6	6	10	6	3	3	4	8	6	5	4	5	4	9	5	84																																																																																																																																																																																																																																																																																																																																																							
S237																					0	4	4	5	5	7	4	6	9	8	4	5	5	7	6	2	4	5	4	7	4	6	5	4	5	5	6	94																																																																																																																																																																																																																																																																																																																																																							
S238																					0	4	7	5	6	6	5	8	3	8	5	5	9	5	2	2	3	7	5	6	3	4	3	8	4	75																																																																																																																																																																																																																																																																																																																																																									
S239																						0	8	5	7	4	4	5	8	2	6	5	5	7	7	5	4	5	7	5	2	5	4	6	8	6	54																																																																																																																																																																																																																																																																																																																																																								
S240																							0	3	3	3	4	4	6	3	4	4	5	3	3	3	5	5	4	4	3	8	6	8	5	2	2	52																																																																																																																																																																																																																																																																																																																																																							
S241																								0	4	2	1	6	5	4	5	6	2	4	4	3	5	4	6	4	7	5	5	3	3	4	43																																																																																																																																																																																																																																																																																																																																																								
S242																									0	4	5	3	2	3	5	4	2	4	6	6	6	7	3	4	5	3	7	4	3	4	23																																																																																																																																																																																																																																																																																																																																																								
S244																										0	1	5	3	3	2	4	4	4	2	3	4	6	5	3	4	6	6	4	5	3	6	42																																																																																																																																																																																																																																																																																																																																																							
S245																											0	4	3	3	4	5	3	3	5	2	5	4	4	5	6	6	4	3	4	4	32																																																																																																																																																																																																																																																																																																																																																								
S246																												0	3	3	5	6	4	6	8	6	5	6	2	8	3	3	5	5	7	5	25																																																																																																																																																																																																																																																																																																																																																								
S247																													0	4	4	5	5	3	7	5	8	7	1	7	6	6	6	4	4	5	33																																																																																																																																																																																																																																																																																																																																																								
S248																														0	5	0	2	5	5	3	4	5	4	3	2	2	3	5	6	3	24																																																																																																																																																																																																																																																																																																																																																								
S249																														0	7	7	1	3	7	6	5	3	5	6	6	4	6	2	7	54																																																																																																																																																																																																																																																																																																																																																									
S250																															0	4	6	6	4	7	8	6	4	5	4	5	6	7	5	45																																																																																																																																																																																																																																																																																																																																																									
S251																																0	6	6	5	5	6	6	4	5	3	7	5	5	3	24																																																																																																																																																																																																																																																																																																																																																									
S252																																	0	4	6	7	6	4	4	7	7	5	5	1	6	43																																																																																																																																																																																																																																																																																																																																																									
S253																																		0	5	4	6	4	9	5	5	6	3	6	84																																																																																																																																																																																																																																																																																																																																																										
S254																																		0	4	3	6	5	7	5	3	1	6	3	64																																																																																																																																																																																																																																																																																																																																																										
S255																																			0	1	7	3	6	5	6	4	6	2	74																																																																																																																																																																																																																																																																																																																																																										
S256																																				0	6	4	7	6	5	3	5	2	84																																																																																																																																																																																																																																																																																																																																																										
S257																																					0	8	5	5	5	5	5	6	44																																																																																																																																																																																																																																																																																																																																																										
S258																																						0	7	6	7	5	3	3	63																																																																																																																																																																																																																																																																																																																																																										
S259																																							0	3	4	6	8	6	36																																																																																																																																																																																																																																																																																																																																																										
S260																																																																																																																																																																																																																																																																																																																																																																																																							

Dendrograma - Variedades de Soja



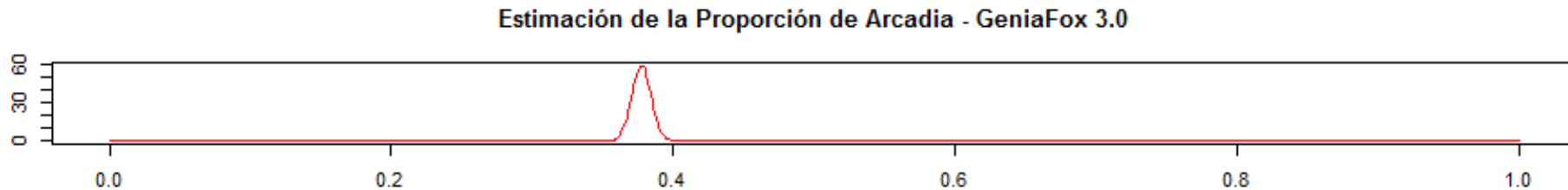
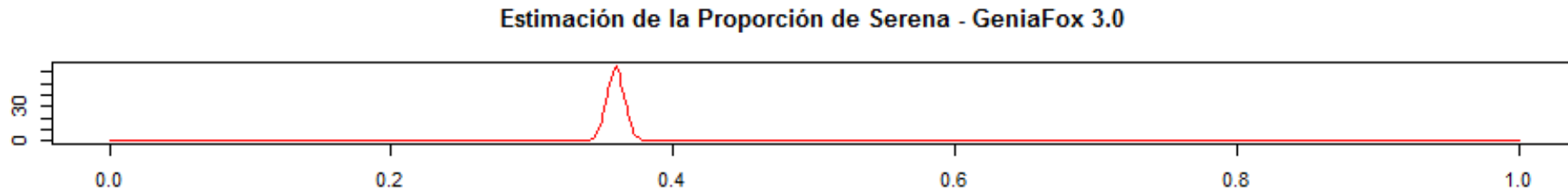
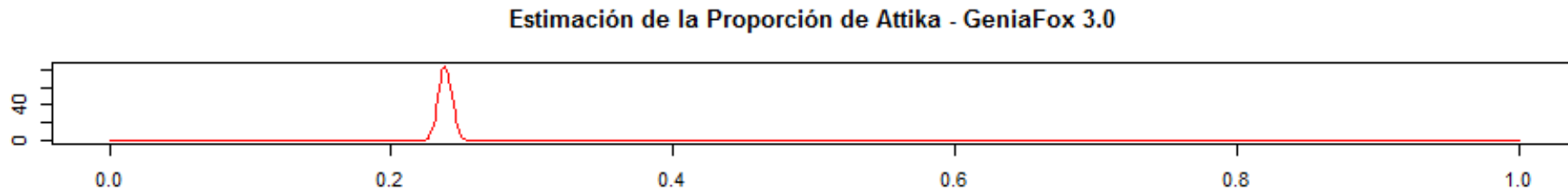
distancias
hclust (*, "complete")

Determinación de mezclas

- La frecuencia de reads de cada alelo es proporcional a la frecuencia de moléculas de ADN inicial.
- La proporción de variedades de la mezcla de puede determinar mediante la frecuencia de cada SNP.

var A	A	T	T	G	G	C	A	A
var A	A	T	T	G	G	C	A	A
var A	A	T	T	G	G	C	A	A
var A	A	T	T	G	G	C	A	A
var B	G	T	T	G	C	C	A	A
var B	G	T	T	G	C	C	A	A
frecuencias	0,66	1	1	1	0,66	1	1	1

Ejemplo de mezcla de Attika (22,5-25.0) Serena (34,2'37,5) y Arcadia (35,9-39,4)



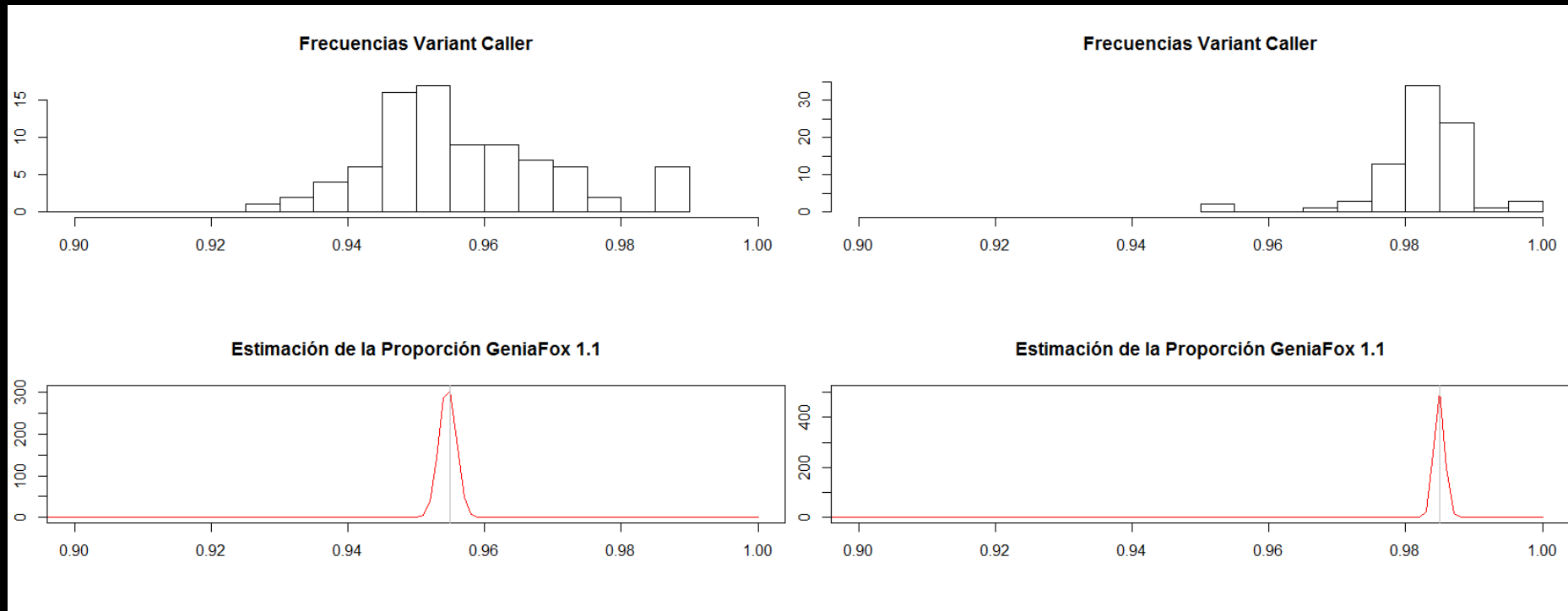
GeniaFox

Pureza

- Var.Uru.11 con trazas de Var.Uru.14 :

95,5% de pureza.

98,5% de pureza.



Intervalo de confianza (99%): 95,0% - 95,7%

Intervalo de confianza (99%): 98,2% - 98,6%

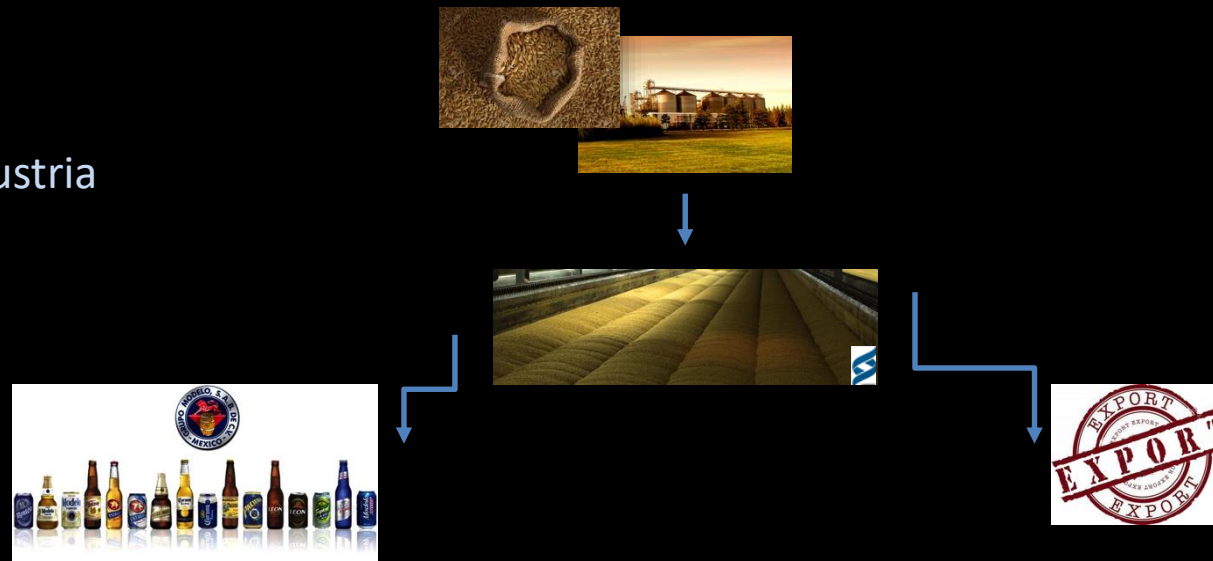
Util para control en distintas etapas

➤ Pureza varietal en campo



➤ Pureza varietal Industria

- (calidad maltera)
- Análisis de mezcla



Beneficios:

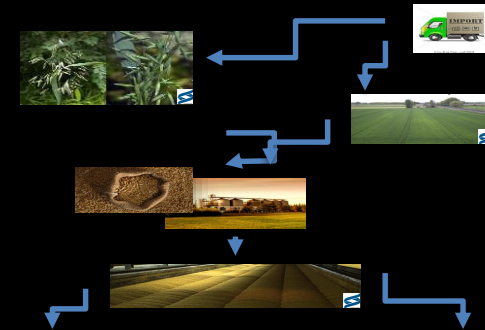
Alta sensibilidad: hasta 0.8% en una muestra.



Seguro: Intervalo de confianza del ensayo de un 99%.

Flexible: Semilla, planta, grano, malta.

Rapidez: 15 días.



Conclusiones

- Paneles de 400 SNPs en cebada y en soja.
- Panel mínimo de 11 SNPs para 50 variedades.
- La información interrogada es mínima, protegiendo información sensible.
- Mediante NGS la tipificación de SNPs puede cuantificar mezclas y determinar pureza.



Gracias !!!



Contacto

azambuja@genia.com.uy

Uruguay

Genia / Genética molecular
Br. Artigas 922 - Montevideo
Tel.: (598) 2712 1212
laboratorio@genia.com.uy
www.genia.com.uy

Argentina

Laboratorio Genia
Juncal 2712, Capital Federal
Buenos Aires, Argentina
Tel.: (5411) 4822 6333
genia@laboratoriogenia.com
www.laboratoriogenia.com



Brasil

Laboratorio Genia
Av. Borges de Medeiros, 2500 sala
1805
Bairro Praia de Belas
Porto Alegre - RS
Tel: (51) 3268 0086
brites@laboratoriogenia.com
www.laboratoriogenia.com.br

Paraguay

REINHART Comercial SRL
Gral. Santos esquina Concordia
Complejo Santos - Of. E4
(595-21) 205495 / 201164
gizella@reinhart.com