

SI Appendix: High-Precision Chronology for Central American Maize Diversification from El Gigante Rockshelter, Honduras

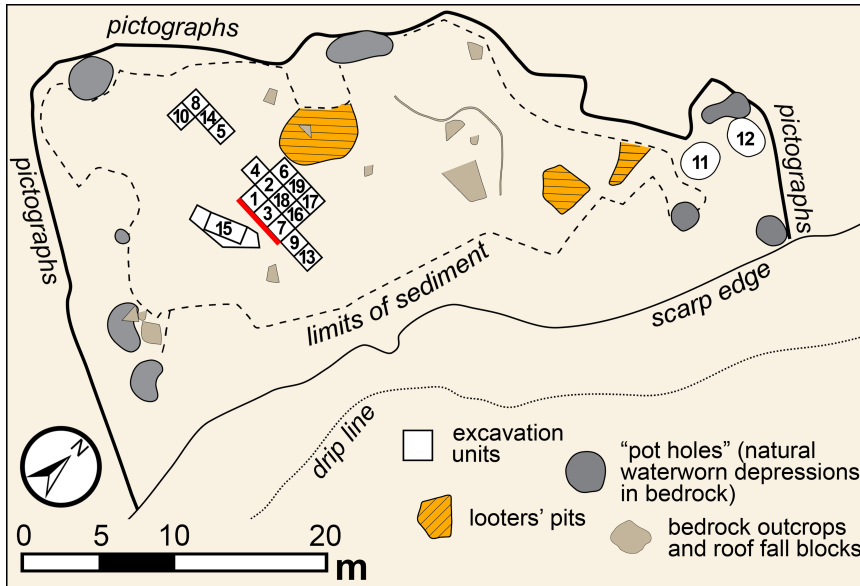


Fig. S1. Plan view of the El Gigante rockshelter.

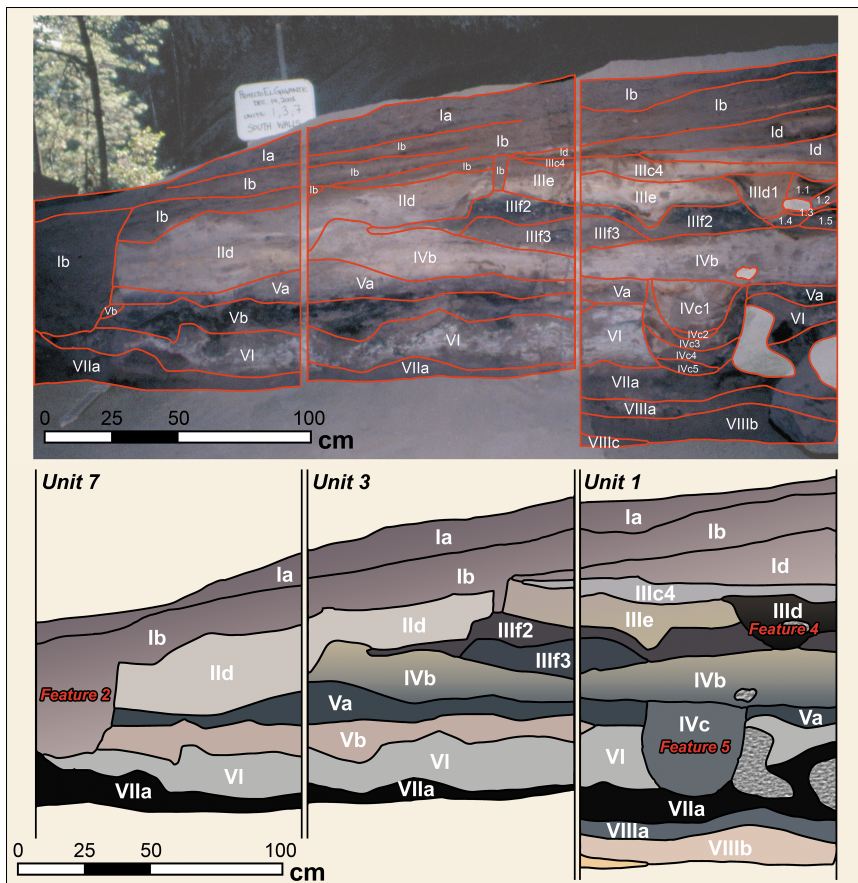


Fig. S2. An example of site stratigraphy at El Gigante (Units 1, 3 and 7, south profile).

Table S1. Maize cobs from El Gigante directly dated by AMS ¹⁴C.

Lab No.	PSU No.	Sample ID	Conventional ¹⁴ C yrs BP	2σ range (cal BP)	Provenience
UCIAMS-128441	PSU-5630	EG70	3870 ± 15	4407 – 4240	Unit 7, level 9, stratum II d
UCIAMS-128444*	PSU-5633	EG73	3830 ± 15	4288 – 4153	Unit 18, level 18, stratum II d
UCIAMS-90933†	PSU-4732	EG10	3825 ± 20	4295 – 4148	Unit 1, level 11, feature 4, stratum III d
UCIAMS-127387	PSU-5605	EG66	3815 ± 20	4287 – 4101	Unit 6, level 19, stratum II a
UCIAMS-127384	PSU-5602	EG63	3780 ± 25	4237 – 4087	Unit 19, level 21, stratum II c
UCIAMS-127386	PSU-5604	EG65	3775 ± 20	4234 – 4086	Unit 6, level 18, stratum II a
UCIAMS-130720	PSU-5693	EG74	3765 ± 25	4235 – 4006	Unit 19, level 21, stratum II c
UCIAMS-130721	PSU-5694	EG75	3745 ± 25	4224 – 3988	Unit 19, level 21, stratum II c
UCIAMS-93254	PSU-4754	EG14	3740 ± 20	4154 – 3991	Unit 19, level 21, stratum II c
UCIAMS-130722	PSU-5695	EG76	3735 ± 25	4154 – 3985	Unit 19, level 21, stratum II c
UCIAMS-93253	PSU-4753	EG12	3730 ± 20	4150 – 3988	Unit 7, level 9, stratum II d
Beta-159055	--	S04	2280 ± 40	2353 – 2157	Unit 2, Level 14a, stratum I c/II c int.
UCIAMS-127385*†	PSU-5603	EG64	2270 ± 20	2346 – 2182	Unit 19, level 21, stratum II c
UCIAMS-173149	PSU-6945	EG79	2260 ± 15	2341 – 2182	Unit 1, level 5, stratum I b
UCIAMS-128443*	PSU-5632	EG72	2250 ± 15	2338 – 2160	Unit 18, level 17, stratum II b2
UCIAMS-90934	PSU-4733	EG11	2240 ± 20	2333 – 2158	Unit 3, level 9, stratum I b, feature 2
UCIAMS-90935	PSU-4734	EG13	2240 ± 20	2333 – 2158	Unit 18, level 21, stratum I b2
UCIAMS-128442*	PSU-5631	EG71	2220 ± 15	2314 – 2155	Unit 18, level 15, stratum I b
UCIAMS-173151	PSU-6947	EG81	2220 ± 15	2314 – 2155	Unit 1, level 6, stratum I b
UCIAMS-173150	PSU-6946	EG80	2215 ± 15	2312 – 2154	Unit 1, level 6, stratum I b
UCIAMS-173153	PSU-6949	EG83	2215 ± 15	2312 – 2154	Unit 2, level 5, stratum I a/I b
UCIAMS-173159	PSU-6955	EG89	2210 ± 15	2310 – 2153	Unit 18, level 13b, stratum II b2
UCIAMS-127383*†	PSU-5601	EG62	2175 ± 20	2306 – 2120	Unit 1, level 12, stratum III
UCIAMS-173156	PSU-6952	EG86	2170 ± 15	2304 – 2120	Unit 3, level 8, stratum I b
UCIAMS-173160	PSU-6956	EG90	2165 ± 15	2302 – 2119	Unit 18, level 14, stratum I b2
UCIAMS-173158	PSU-6954	EG88	2165 ± 15	2302 – 2119	Unit 18, level 8, stratum I b
UCIAMS-173148	PSU-6944	EG78	2155 ± 20	2303 – 2063	Unit 1, level 4, stratum I a
UCIAMS-173155	PSU-6951	EG85	2155 ± 15	2300 – 2069	Unit 2, level 6, stratum I b/I c
UCIAMS-173152	PSU-6948	EG82	2135 ± 15	2292 – 2056	Unit 2, level 5, stratum I a/I b
Beta-171701	--	S03	2010 ± 40	2103 – 1876	Unit 18, level 20, stratum I b2
UCIAMS-93255	PSU-4755	EG15	1950 ± 15	1944 – 1866	Unit 19, level 5, stratum I b, feature 2
UCIAMS-127389*	PSU-5607	EG68	1945 ± 20	1945 – 1828	Unit 16, level 17, stratum I d/II d interface
UCIAMS-127388*	PSU-5606	EG67	1945 ± 20	1945 – 1828	Unit 16, level 16, stratum I d
UCIAMS-128440	PSU-5629	EG69	1925 ± 15	1919 – 1825	Unit 7, level 8, stratum I d/II d interface
UCIAMS-173154	PSU-6950	EG84	1880 ± 15	1877 – 1741	Unit 2, level 6, stratum I b/I c
UCIAMS-173157†	PSU-6953	EG87	1775 ± 15	1733 – 1619	Unit 18, level 3, stratum I b
UCIAMS-173147	PSU-6943	EG77	1285 ± 15	1278 – 1182	Unit 1, level 3, stratum I a

* – sample derived from carbonized maize cobs

† – date omitted from age model

Table S2. OxCal tabular output (^Amodel = 102.4; ^Aoverall = 101.4).

Lab no.	PSU no.	Sample ID	Provenience	Sample material	¹⁴ C BP	Unmodeled (BP; 2σ)	Modeled (BP; 2σ)	A	C
<i>Boundary Earliest</i>							13347 – 10780	86.3	
<i>Boundary Start Esperanza</i>							11114 – 10773	99.0	
Early Esperanza (V-IV)									
Beta-156246	---	S12	Unit 3, level 24, stratum Va	charcoal	9600 ± 60	11169 – 10746	11010 – 10700	95.8	99.7
Beta-156245	---	S11	Unit 1, levels 19-22, fea. 5, stratum IVc3	charcoal	9590 ± 60	11163 – 10738	11012 – 10696	97.0	99.6
UCIAMS-90929	PSU-4728	EG06	Unit 4, level 19, stratum VI	<i>Spondias</i> sp.	9550 ± 35	11085 – 10716	11032 – 10703	94.5	99.8
UCIAMS-120931	PSU-5394	EG60	Unit 18, level 38, stratum Va	charcoal	9550 ± 25	11077 – 10726	11040 – 10713	90.3	99.8
UCIAMS-112164	PSU-5190	EG49	Unit 16, level 20b, stratum Vb	cf. zapote husk	9455 ± 20	10755 – 10599	10754 – 10599	100.2	99.8
UCIAMS-90928	PSU-4727	EG05	Unit 4, level 15, stratum IVb	<i>Spondias</i> sp.	9375 ± 25	10680 – 10520	10680 – 10519	100.0	99.8
UCIAMS-90927	PSU-4726	EG04	Unit 3, level 26, stratum VI	<i>Spondias</i> sp.	9375 ± 25	10680 – 10520	10680 – 10520	100.0	99.8
UCIAMS-108394	PSU-5057	EG25	Unit 6, level 27a, stratum IVb, feature 6-4 (pit)	single twig	9335 ± 20	10646 – 10497	10646 – 10497	100.0	99.8
UCIAMS-90931	PSU-4730	EG08	Unit 18, level 40, stratum VI	<i>Spondias</i> sp.	9325 ± 30	10650 – 10428	10650 – 10427	99.9	99.7
UCIAMS-93256	PSU-4756	EG19	Unit 2, level 20, stratum IVb	<i>Spondias</i> sp.	9315 ± 25	10585 – 10428	10585 – 10428	99.9	99.8
UCIAMS-108399	PSU-5062	EG33	Unit 18, level 33a, stratum IV, below feature 18-4	single twig	9310 ± 20	10578 – 10432	10578 – 10433	100.0	99.8
Beta-171699	---	S15	Unit 1, level 23b, stratum VIIIa	cordage	9290 ± 40	10586 – 10298	10586 – 10298	100.3	99.7
UCIAMS-90932	PSU-4731	EG09	Unit 18, level 41, stratum VIIa	<i>Spondias</i> sp.	9270 ± 25	10563 – 10301	10563 – 10301	100.3	99.7
Beta-171700	---	S14	Unit 3, level 28, stratum VI	quid	9240 ± 40	10541 – 10262	10543 – 10266	100.6	99.7
Beta-171706	---	S13	Unit 19, level 37, stratum Vb	charcoal	9210 ± 60	10543 – 10241	10547 – 10244	100.2	99.7
UCIAMS-120929	PSU-5392	EG58	Unit 16, level 18, stratum IVb	<i>Spondias</i> sp.	9190 ± 20	10413 – 10252	10415 – 10252	99.6	99.8
UCIAMS-116848	PSU-5328	EG50	Unit 1, level 17a, stratum IVb	charcoal	9105 ± 30	10370 – 10202	10386 – 10218	81.2	99.8
<i>Boundary Early-Late Esperanza transition</i>							10355 – 10084	99.7	
Late Esperanza (IV-III interface)									
UCIAMS-115015	PSU-5248	EG48	Unit 18, level 31, str. III/IV interface	<i>Spondias</i> sp. (carbonized)	8880 ± 25	10158 – 9907	10157 – 9906	100.0	99.7

Lab no.	PSU no.	Sample ID	Provenience	Sample material	¹⁴ C BP	Unmodeled (BP; 2σ)	Modeled (BP; 2σ)	A	C
UCIAMS-117703	PSU-5353	EG52	Unit 2, level 19b, stratum IV	charcoal	8835 ± 25	10147 – 9741	10146 – 9741	100.1	99.7
UCIAMS-117707	PSU-5357	EG56	Unit 4, level 14, str. III/IV interface	<i>Spondias</i> sp.	8790 ± 20	9902 – 9704	9902 – 9703	100.0	99.7
UCIAMS-108404	PSU-5067	EG38	Unit 19, level 35, stratum IVb	single wood	8670 ± 20	9673 – 9549	9675 – 9550	97.2	99.9
UCIAMS-108390	PSU-5053	EG20	Unit 1, level 15, stratum IVb	single wood	8665 ± 20	9671 – 9547	9673 – 9548	96.3	99.8

Boundary End Esperanza

9644 – 9148 99.5

Boundary Begin Marcala

9413 – 8770 99.5

Early Marcala (III_f-III_e)

UCIAMS-90937	PSU-4736	EG17	Unit 19, level 34, stratum III _f 2, feature 14	quid	7985 ± 25	8996 – 8728	8991 – 8724	96.6	99.8
UCIAMS-108393	PSU-5056	EG24	Unit 6, level 24, stratum III _f	single wood	7925 ± 20	8972 – 8636	8969 – 8635	103.3	99.8
UCIAMS-120930	PSU-5393	EG59	Unit 18, level 30, stratum III _f 2	<i>Spondias</i> sp.	7205 ± 25	8149 – 7958	8149 – 7958	99.9	99.9
Beta-156244	---	S09	Unit 3, levels 15-17, stratum III _f 2	charcoal	7140 ± 200	8354 – 7618	8349 – 7654	101.3	99.2
UCIAMS-112162	PSU-5188	EG46	Unit 19, level 28, stratum IV _a	avocado seed (charred)	6985 ± 20	7924 – 7753	7924 – 7753	99.9	99.9
UCIAMS-108398	PSU-5061	EG32	Unit 18, level 32a, str. III _f 1, fea. 18-5	single wood	6890 ± 20	7785 – 7673	7785 – 7673	99.9	99.9

Boundary Early-Middle Marcala transition

7650 – 7522 99.7

Middle Marcala (III_e-III_d)

UCIAMS-120928	PSU-5391	EG57	Unit 6, level 21, stratum III _e	<i>Spondias</i> sp.	6720 ± 20	7618 – 7521	7607 – 7514	83.3	99.8
UCIAMS-108403	PSU-5066	EG37	Unit 19, level 29, stratum III _e , fea. 19-2 and 6-3	single wood	6665 ± 20	7580 – 7503	7579 – 7501	100.6	99.9
Beta-156247	---	S08	Unit 18, level 27, stratum III _d 3, fea. 3	charcoal	6630 ± 60	7591 – 7428	7578 – 7437	105.4	99.9
UCIAMS-108402	PSU-5065	EG36	Unit 19, level 26, str. III _e , fea. 19-2	single twig	6630 ± 20	7569 – 7475	7568 – 7475	99.0	99.9
UCIAMS-108391	PSU-5054	EG21	Unit 2, level 18b, stratum III, fea. 3	single wood	6620 ± 20	7567 – 7465	7565 – 7466	99.9	99.9
UCIAMS-90926	PSU-4725	EG02	Unit 2, level 17a, stratum III _e , fea. 3	<i>Spondias</i> sp.	6600 ± 25	7564 – 7435	7563 – 7437	102.3	99.9
UCIAMS-108401	PSU-5064	EG35	Unit 19, level 25, stratum III _e	single twig	6585 ± 20	7557 – 7433	7556 – 7435	101.9	99.9
UCIAMS-112163	PSU-5189	EG47	Unit 6, level 20, stratum III _e	quid (single fiber)	6580 ± 20	7555 – 7432	7554 – 7434	101.0	99.9

Lab no.	PSU no.	Sample ID	Provenience	Sample material	¹⁴ C BP	Unmodeled (BP; 2σ)	Modeled (BP; 2σ)	A	C
UCIAMS-90930	PSU-4729	EG07	Unit 6, level 25, stratum IIIf	<i>Spondias</i> sp.	6545 ± 20	7483 – 7425	7488 – 7427	92.6	99.9
UCIAMS-107522	PSU-5026	EG31	Unit 18, level 27, stratum IIIf, fea. 2-2	leaf	6540 ± 20	7480 – 7424	7485 – 7426	89.9	99.9

Boundary End Middle Marcala

7471 – 7376 99.4

Boundary Start Late Marcala

4389 – 4245 99.4

Late Marcala (IIc-IIa)

UCIAMS-108397	PSU-5060	EG30	Unit 18, level 19, stratum II	single wood	3880 ± 20	4409 – 4246	4344 – 4162	84.8	99.9
UCIAMS-128441	PSU-5630	EG70	Unit 7, level 9, stratum IIc	<i>Zea mays</i> cob	3870 ± 15	4407 – 4240	4344 – 4163	109.0	99.9
UCIAMS-117705	PSU-5355	EG54	Unit 6, level 20, stratum IIa7	<i>tree legume</i>	3855 ± 15	4406 – 4160	4337 – 4158	113.3	99.9
UCIAMS-128444	PSU-5633	EG73	Unit 18, level 18, stratum IIc	<i>Zea mays</i> cob (charred)	3830 ± 15	4288 – 4154	4284 – 4154	103.8	99.9
UCIAMS-107519	PSU-5023	EG22	Unit 3, level 14, stratum II	single wood	3825 ± 15	4285 – 4152	4280 – 4152	102.3	99.9
UCIAMS-127387	PSU-5605	EG66	Unit 6, level 19, stratum IIa	<i>Zea mays</i> cob	3815 ± 20	4287 – 4101	4282 – 4103	102.5	99.9
Beta-171703	---	S06	Unit 18, level 18, stratum IIc	charcoal	3780 ± 60	4405 – 3981	4292 – 4077	119.7	99.9
UCIAMS-127384	PSU-5602	EG63	Unit 19, level 21, stratum IIc	<i>Zea mays</i> cob	3780 ± 25	4237 – 4088	4235 – 4091	101.2	99.8
UCIAMS-127386	PSU-5604	EG65	Unit 6, level 18, stratum IIa	<i>Zea mays</i> cob	3775 ± 20	4233 – 4087	4232 – 4089	99.0	99.8
UCIAMS-130720	PSU-5693	EG74	Unit 19, level 21, stratum IIc	<i>Zea mays</i> cob	3765 ± 25	4235 – 4007	4233 – 4085	104.2	99.8
UCIAMS-130721	PSU-5694	EG75	Unit 19, level 21, stratum IIc	<i>Zea mays</i> cob	3745 ± 25	4224 – 3988	4227 – 4074	114.2	99.8
UCIAMS-93254	PSU-4754	EG14	Unit 19, level 21, stratum IIc	<i>Zea mays</i> cob	3740 ± 20	4153 – 3991	4220 – 4075	116.6	99.8
UCIAMS-130722	PSU-5695	EG76	Unit 19, level 21, stratum IIc	<i>Zea mays</i> cob	3735 ± 25	4154 – 3985	4224 – 4021	110.6	99.9
UCIAMS-93253	PSU-4753	EG12	Unit 7, level 9, stratum IIc	<i>Zea mays</i> cob	3730 ± 20	4150 – 3988	4153 – 4021	106.6	99.9

Boundary End Late Marcala

4133 – 3994 99.5

Boundary Start Estanzuela

4006 – 3249 99.5

Estanzuela (Middle Formative; IIc-IIa)

Beta-171704	---	S07	Unit 18, level 21, stratum Ib2/IIc interface	charcoal	3100 ± 40	3398 – 3185	3390 – 3183	98.9	99.8
Beta-156243	---	S05	Unit 18, level 16, stratum IIc	charcoal	3040 ± 220	3820 – 2749	3560 – 2775	109.5	99.6

Lab no.	PSU no.	Sample ID	Provenience	Sample material	¹⁴ C BP	Unmodeled (BP; 2σ)	Modeled (BP; 2σ)	A	C
UCIAMS-112161	PSU-5187	EG45	Unit 6, level 18, stratum IIa6	avocado seed (charred)	2755 ± 20	2919 – 2784	2921 – 2785	98.7	99.9
<i>Boundary End Middle Formative</i>							2865 – 2366		99.7
<i>Boundary Start Late Formative</i>							2396 – 2280		99.7

Estanzuela (Late Formative; Id-Ia)

Beta-159055	---	S04	Unit 2, level 14a, str. Ic/IIc interface	<i>Zea mays</i> cob	2280 ± 40	2353 – 2157	2348 – 2156	93.0	99.8
UCIAMS-109340	PSU-5105	EG39	Unit 19, level 4, stratum Ib	Human Hair	2280 ± 15	2347 – 2206	2345 – 2186	83.8	99.8
UCIAMS-173149	PSU-6945	EG79	Unit 1, level 5, stratum Ib	<i>Zea mays</i> cob	2260 ± 15	2340 – 2182	2338 – 2181	95.5	99.9
UCIAMS-128443	PSU-5632	EG72	Unit 18, level 17, stratum IIb2	<i>Zea mays</i> cob (charred)	2250 ± 15	2337 – 2161	2335 – 2161	99.3	99.9
UCIAMS-90934	PSU-4733	EG11	Unit 3, level 9, stratum Ib, fea. 2	<i>Zea mays</i> cob	2240 ± 20	2333 – 2158	2330 – 2158	100.8	99.9
UCIAMS-90935	PSU-4734	EG13	Unit 18, level 21, stratum Ib2	<i>Zea mays</i> cob	2240 ± 20	2333 – 2158	2330 – 2158	100.7	99.8
UCIAMS-117704	PSU-5354	EG53	Unit 18, level 17, stratum Ib2	tree legume	2230 ± 15	2322 – 2157	2320 – 2157	100.6	99.9
UCIAMS-173151	PSU-6947	EG81	Unit 1, level 6, stratum Ib	<i>Zea mays</i> cob	2220 ± 15	2314 – 2155	2313 – 2155	100.3	99.9
UCIAMS-128442	PSU-5631	EG71	Unit 18, level 15, stratum Ib	<i>Zea mays</i> cob (charred)	2220 ± 15	2314 – 2155	2313 – 2155	100.3	99.9
UCIAMS-173153	PSU-6949	EG83	Unit 2, level 5, stratum Ia/Ib	<i>Zea mays</i> cob	2215 ± 15	2312 – 2154	2311 – 2154	100.2	99.8
UCIAMS-173150	PSU-6946	EG80	Unit 1, level 6, stratum Ib	<i>Zea mays</i> cob	2215 ± 15	2312 – 2154	2311 – 2154	100.3	99.9
UCIAMS-173159	PSU-6955	EG89	Unit 18, level 13b, stratum Ib2	<i>Zea mays</i> cob	2210 ± 15	2310 – 2153	2309 – 2153	100.2	99.9
UCIAMS-173156	PSU-6952	EG86	Unit 3, level 8, stratum Ib	<i>Zea mays</i> cob	2170 ± 15	2302 – 2121	2302 – 2121	99.4	99.8
UCIAMS-173158	PSU-6954	EG88	Unit 18, level 8, stratum Ib	<i>Zea mays</i> cob	2165 ± 15	2301 – 2119	2301 – 2118	99.6	99.8
UCIAMS-173160	PSU-6956	EG90	Unit 18, level 14, stratum Ib2	<i>Zea mays</i> cob	2165 ± 15	2301 – 2119	2301 – 2118	99.6	99.8
UCIAMS-173148	PSU-6944	EG78	Unit 1, level 4, stratum Ia	<i>Zea mays</i> cob	2155 ± 20	2302 – 2064	2302 – 2063	100.2	99.8
UCIAMS-173155	PSU-6951	EG85	Unit 2, level 6, stratum Ib/Ic	<i>Zea mays</i> cob	2155 ± 15	2300 – 2069	2300 – 2069	100.3	99.8
UCIAMS-107521	PSU-5025	EG29	Unit 18, level 13b, stratum Ib2, grass litter-pit	grass	2150 ± 15	2299 – 2066	2299 – 2066	100.6	99.8
UCIAMS-173152	PSU-6948	EG82	Unit 2, level 5, stratum Ia/Ib	<i>Zea mays</i> cob	2135 ± 15	2292 – 2057	2292 – 2057	100.3	99.8
Beta-316169	---	---	Unit 18, level 13b, stratum Ib2	gourd rind	2110 ± 30	2282 – 1995	2281 – 1995	100.1	99.7

Lab no.	PSU no.	Sample ID	Provenience	Sample material	¹⁴ C BP	Unmodeled (BP; 2σ)	Modeled (BP; 2σ)	A	C
UCIAMS-112156	PSU-5182	EG40	Unit 18, level 13b, stratum lb2	bean (charred)	2100 ± 20	2129 – 2001	2129 – 2001	100.0	99.8
UCIAMS-112157	PSU-5183	EG41	Unit 18, level 20, stratum lb	bean (charred)	2090 ± 20	2120 – 1999	2120 – 1999	100.0	99.8
UCIAMS-112159	PSU-5185	EG43	Unit 18, level 13b, stratum lb2	squash seed husk	2090 ± 20	2120 – 1999	2120 – 1999	100.0	99.8
Beta-171701	---	S03	Unit 18, level 20, stratum lb2	<i>Zea mays</i> cob	2010 ± 40	2103 – 1876	2103 – 1876	100.4	99.7
Beta-156242	---	S01	Unit 3, lev. 4 (Unit 1 East profile), str. lb	charcoal	1970 ± 70	2114 – 1738	2110 – 1825	108.5	99.7
UCIAMS-93255	PSU-4755	EG15	Unit 19, level 5, stratum lb, fea. 2	<i>Zea mays</i> cob	1950 ± 15	1944 – 1867	1943 – 1867	101.0	99.9
UCIAMS-127388	PSU-5606	EG67	Unit 16, level 16, stratum ld	<i>Zea mays</i> cob (charred)	1945 ± 20	1945 – 1828	1946 – 1835	102.9	99.9
UCIAMS-127389	PSU-5607	EG68	Unit 16, level 17, str. ld/lld interface	<i>Zea mays</i> cob (charred)	1945 ± 20	1945 – 1828	1946 – 1835	103.0	99.9
Beta-171702	---	S02	Unit 18, level 7, stratum lb, fea. 2	charcoal	1930 ± 60	1998 – 1718	2034 – 1817	111.5	99.7
UCIAMS-128440	PSU-5629	EG69	Unit 7, level 8, str. ld/lld interface	<i>Zea mays</i> cob	1925 ± 15	1919 – 1825	1920 – 1829	106.2	99.9
UCIAMS-173154	PSU-6950	EG84	Unit 2, level 6, stratum lb/lc	<i>Zea mays</i> cob	1880 ± 15	1876 – 1741	1877 – 1820	108.3	99.9
<i>Boundary End Estanzuela</i>						1872 – 1782		99.6	
<i>Boundary Begin Classic</i>						1752 – 1187		99.5	
Classic Period (1a)									
UCIAMS-173147	PSU-6943	EG77	Unit 1, level 3, stratum 1a	<i>Zea mays</i> cob	1285 ± 15	1278 – 1182	1277 – 1182	101.5	99.9
UCIAMS-90938	PSU-4737	EG18	Unit 13, level 8c, stratum lb, fea. 2	deer hair	1150 ± 20	1173 – 981	1175 – 985	87.7	99.8
<i>Boundary Model End</i>							1173 – 407		98.3

Fig. S3. OxCal graphical output.

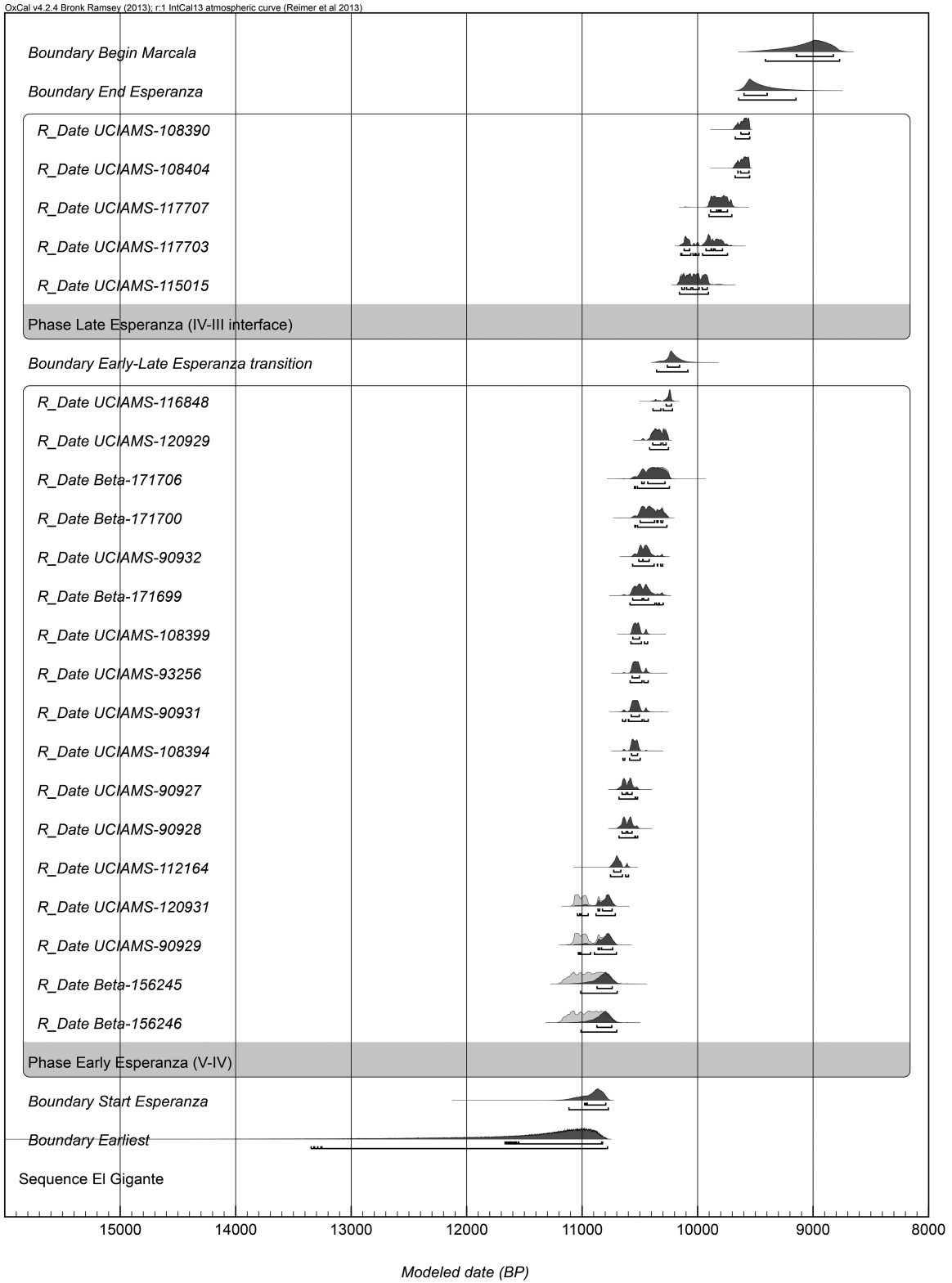


Fig. S3. (continued)

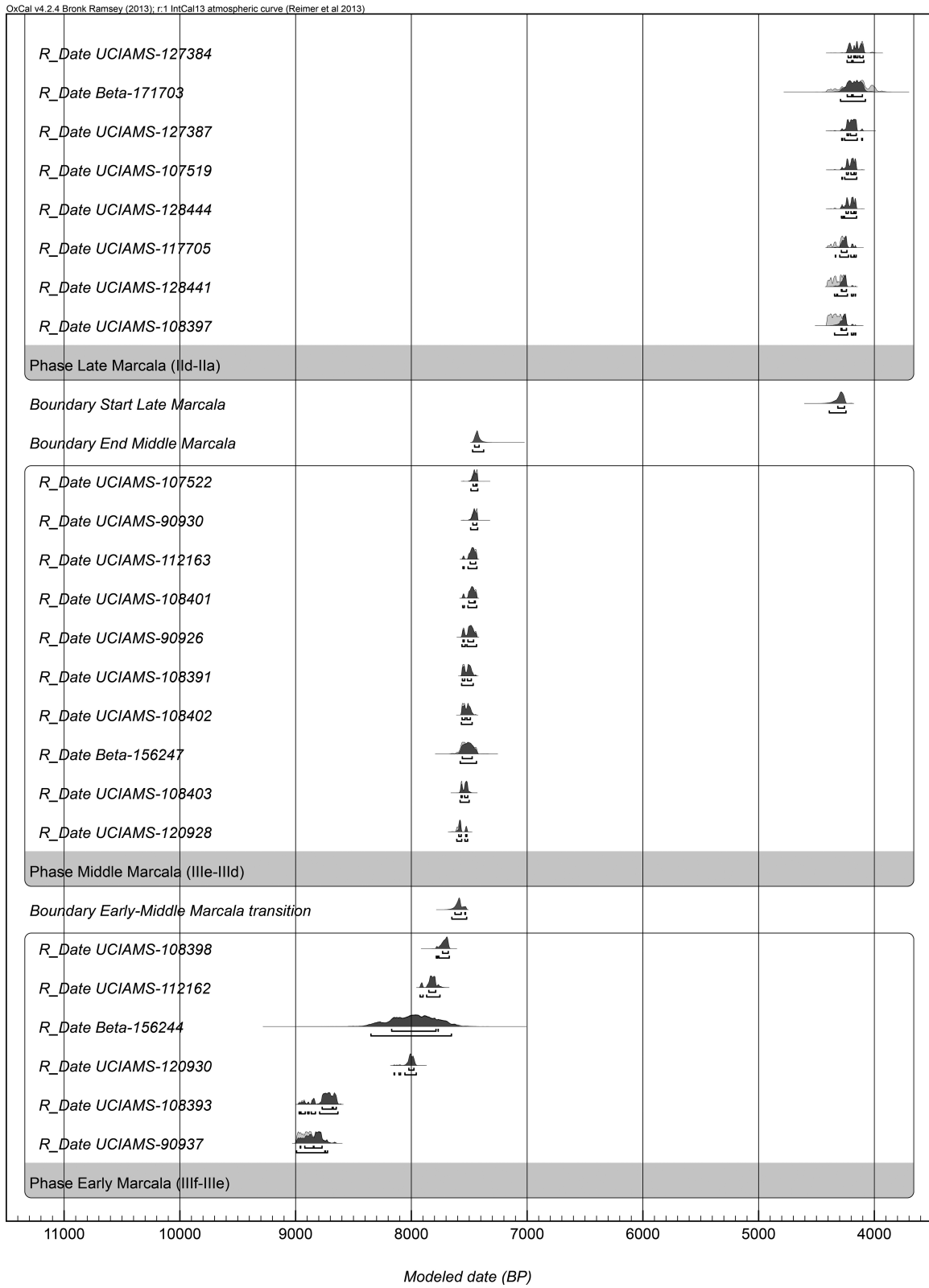


Fig. S3. (continued)

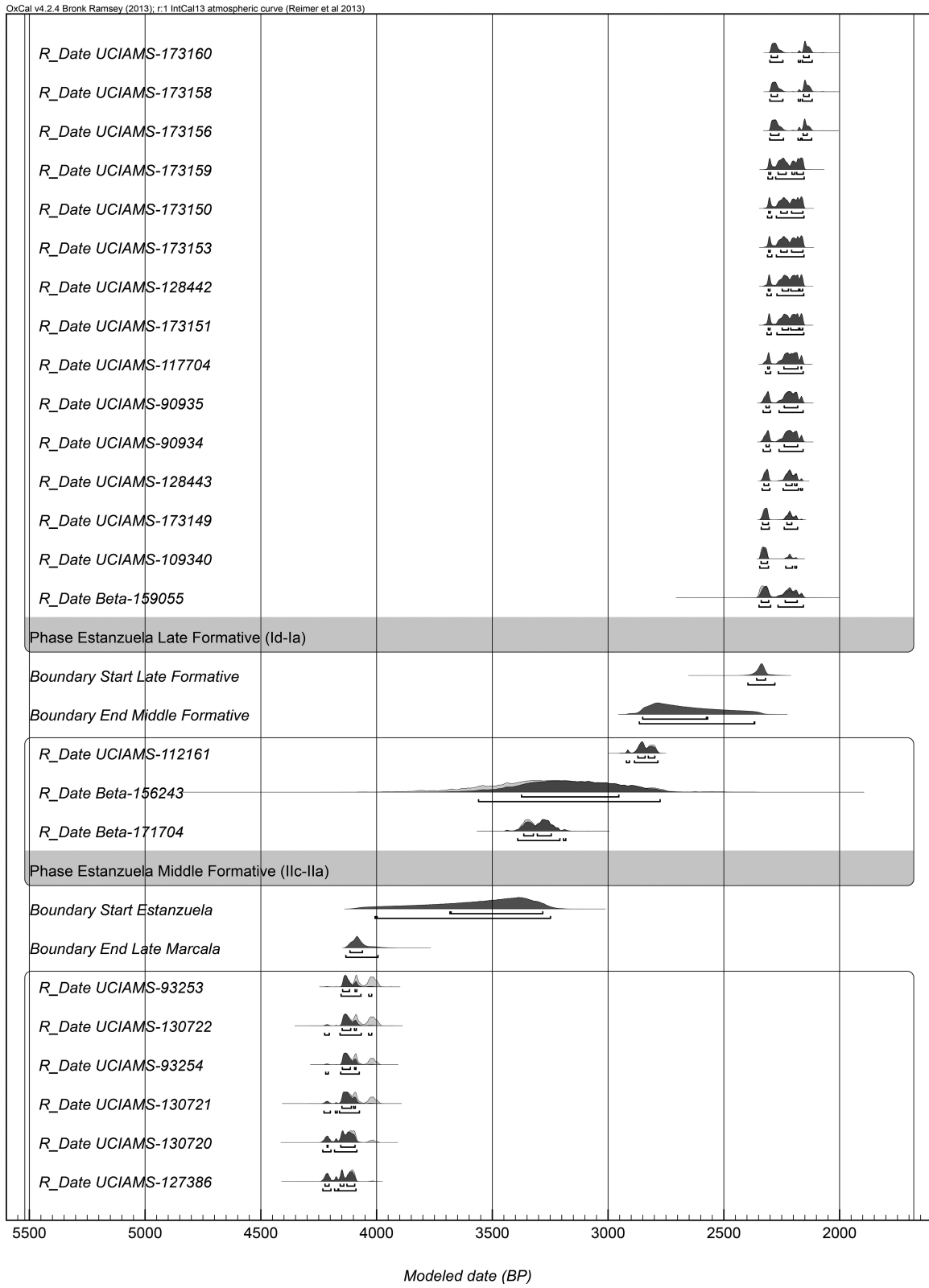
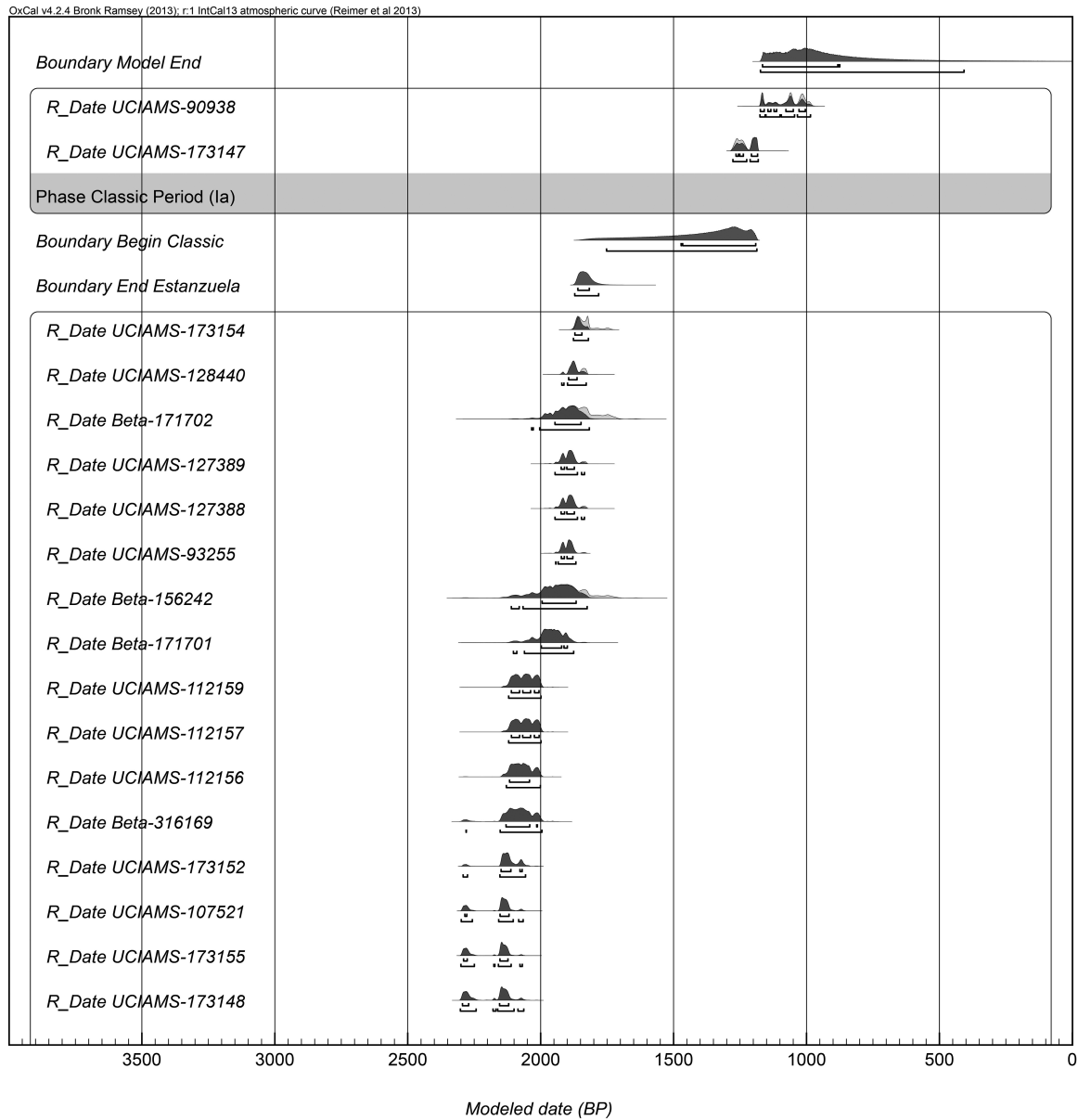


Fig. S3. (continued)



Model CQL2 code

```
Options()
{
  Resolution=1;
  BCAD=FALSE;
  PlusMinus=FALSE;
  SD1=FALSE;
  SD2=TRUE;
  SD3=FALSE;
};
Plot()
{
  Sequence("El Gigante")
  {
    Boundary("Earliest");
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    Phase("Early Esperanza (V-IV)")
    {
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  }
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Phase("Late Marcala (IIId-IIa)")
{
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};
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Boundary("Begin Classic");
Phase("Classic Period (Ia)")
{
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};
Boundary("Model End");
};
};

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Table S3. Dates omitted from the chronological model.

Lab no.	PSU no.	Sample ID	Provenience	Sample material	14C BP	Cal BP (2 σ)	Reason for omission
Beta-?	---	S16	Unknown, stratum IX?	charcoal	39820 \pm 1100	45720 – 42110	Hasemann sample; lack of provenience
UCIAMS-112160	PSU-5186	EG44	Unit 17, level 32, stratum VIIa	ceiba seed (charred)	26420 \pm 300	31117 – 29926	Stratum VII is a pre-human occupation level
ISGS 2966-3	---	S18	Unknown, strata IV-VI	charcoal	9970 \pm 70	11745 – 11239	Hasemann sample; lack of provenience
UCIAMS-107520	PSU-5024	EG28	Unit 17, level 24, feature 17-3, stratum V	single wood	9630 \pm 25	11170 – 10793	Pit with carbon, likely mixed; sample provenience uncertain
ISGS 2965-2	---	S17	Unknown, strata IV-VI	charcoal	9450 \pm 70	11076 – 10510	Hasemann sample; lack of provenience
UCIAMS-90925	PSU-4724	EG01	Unit 1, level 18, feature 5, stratum Va	Persea sp.	8880 \pm 30	10172 – 9897	Date consistent with Esperanza, but context mixed
UCIAMS-108400	PSU-5063	EG34	Unit 19, level 16, feature 8, str. IIa	single wood	6435 \pm 20	7422 – 7318	Date too early for stratum II, feature possibly intrudes into stratum III
UCIAMS-116849	PSU-5329	EG51	Unit 2, level 16a, stratum III	P-seed	6375 \pm 25	7415 – 7257	Poor model agreement (A<60%), not representative of stratigraphic position
Beta-171705	---	S10	Unit 19, level 31, intrusive pit, stratum IIIe	charcoal	6180 \pm 90	7275 – 6800	Uncertain stratigraphic assignment due to pit feature, poor model agreement (A<60%)
UCIAMS-90933	PSU-4732	EG10	Unit 1, level 11, feature 4, stratum IIIId	Zea mays cob	3825 \pm 20	4295 – 4148	Level disturbed by looting of Classic period occupation
UCIAMS-117706	PSU-5356	EG55	Unit 3, level 19, stratum IIIIf2	P-seed	3745 \pm 15	4153 – 4000	Level disturbed by looting of Classic period occupation
UCIAMS-120932	PSU-5395	EG61	Unit 17, level 25, stratum V	P-seed	3740 \pm 15	4151 – 3999	Too late for stratum V, Late Formative disturbance intrudes into this level
UCIAMS-127385	PSU-5603	EG64	Unit 19, level 21, stratum IIc	Zea mays cob (charred)	2270 \pm 20	2346 – 2182	Situated in intrusive charcoal concentration, may be contaminated
UCIAMS-108395	PSU-5058	EG26	Unit 10, level 2, stratum Ia, looting disturbance	textile, painted	2255 \pm 25	2344 – 2158	Level disturbed by looting of Classic period occupation

Lab no.	PSU no.	Sample ID	Provenience	Sample material	14C BP	Cal BP (2σ)	Reason for omission
UCIAMS-108396	PSU-5059	EG27	Unit 13, level 10/11, stratum Ia	petate-grass	2220 ± 20	2319 – 2153	Level disturbed by looting of Classic period occupation
UCIAMS-127383	PSU-5601	EG62	Unit 1, level 12, stratum III	Zea mays cob (charred)	2175 ± 20	2306 – 2120	Level disturbed by looting of Classic period occupation
UCIAMS-112158	PSU-5184	EG42	Unit 10, level 16, stratum II/III-IV interface	squash seed husk	2020 ± 20	2037 – 1900	Level disturbed by looting of Classic period occupation
UCIAMS-90936	PSU-4735	EG16	Unit 6, level 28, stratum IVa	quid	1950 ± 20	1948 – 1830	Date too early for stratum; probably contamination from upper profile
UCIAMS-173157	PSU-6953	EG87	Unit 18, level 3, stratum Ib	Zea mays cob	1775 ± 15	1733 – 1619	Poor model agreement (A<60%); may represent ephemeral Terminal Formative/Early Classic occupation, but date is not corroborated in this study
UCIAMS-108392	PSU-5055	EG23	Unit 4, level 15, stratum IVb	single wood	1685 ± 15	1683 – 1547	Sample context mixed with looting disturbance

Fig. S4. The effect of the Hallstatt Plateau on dating the Middle-Late Formative transition. The bottom sum probability distribution is created from 151 hypothetical dates generated at 20-yr intervals from 4000–1000 B.P. Calibration curve plateaus have a constraining effect on ^{14}C probability distributions, as illustrated by the prominent spikes on either side.

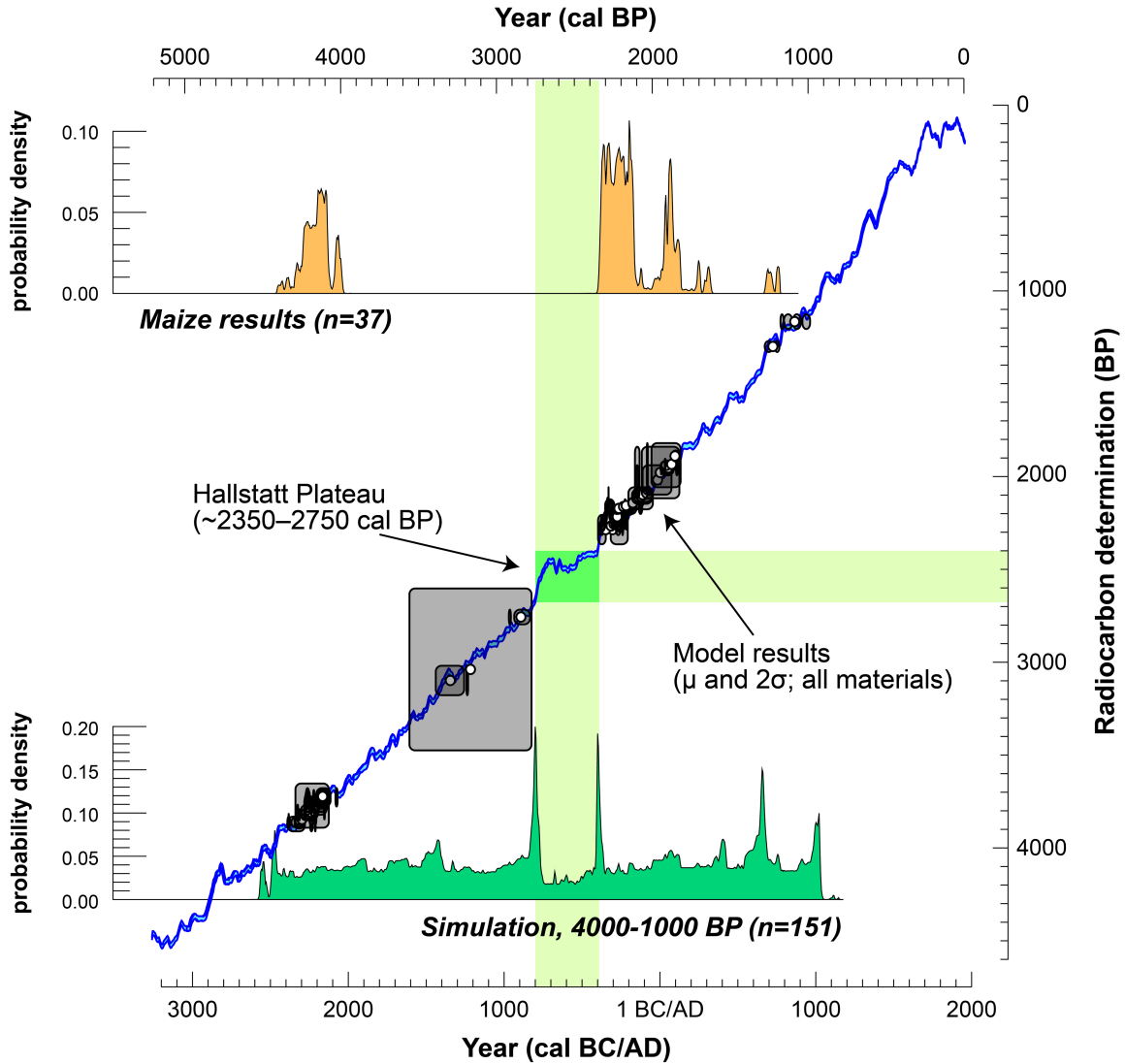


Table S4. Principal component analysis of El Gigante maize specimens.

a. Component matrix

Variable	Component 1	Component 2	Component 3
Row number	0.102	-0.872	0.219
Rachis diameter	0.706	-0.579	0.257
Rachis segment length	0.659	0.453	-0.116
Cupule width	0.839	0.248	-0.289
Cupule length	0.151	0.650	0.416
Cupule depth	0.046	0.287	0.856
Cupule wing width	0.775	0.235	-0.082
Cob diameter	0.842	-0.359	0.091

b. Total variance explained

Component	Initial Eigenvalues		
	Total	% of variance	Cumulative %
1	2.982	37.276	37.276
2	2.053	25.662	62.938
3	1.131	14.137	77.075
4	0.656	8.197	85.273
5	0.467	5.834	91.107
6	0.429	5.367	96.474
7	0.168	2.106	98.579
8	0.114	1.421	100

c. Communalities

Variable	Initial	Extraction
Row number	1	0.818
Rachis diameter	1	0.901
Rachis segment length	1	0.653
Cupule width	1	0.849
Cupule length	1	0.618
Cupule depth	1	0.817
Cupule wing width	1	0.663
Cob diameter	1	0.846

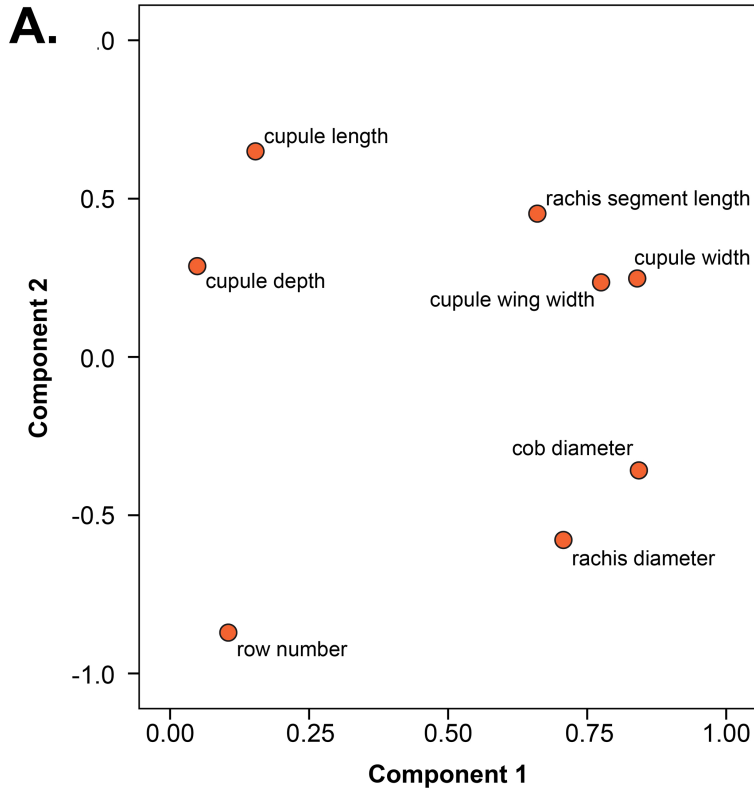


Fig. S5. Results of a principal component analysis examining eight morphological variables. A – plot of variables by component, summarizing the relationship between measured characteristics; B – factor loadings plot, illustrating patterning based on individual sample scores.

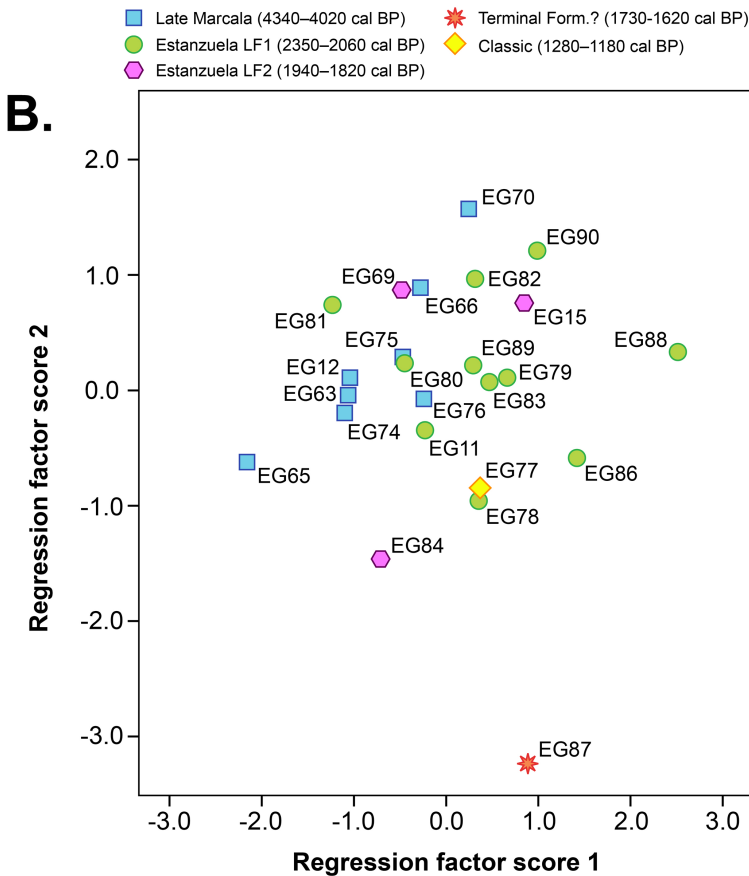


Table S5. Comparison of El Gigante and El Riego maize assemblages.

	Row #	Rachis diam.	Rachis seg. length	Cupule width	Cupule length	Cupule depth	Cupule shape index	Cupule wing width	Cob diam	Rachis/cob index
El Gigante – Late Marcala (4340–4020 cal BP)										
μ	13.33	9.31	3.66	4.02	1.68	1.19	0.42	0.99	13.95	0.68
σ	1.00	1.10	0.49	0.57	0.39	0.30	0.12	0.24	2.84	0.12
σ^2	1.00	1.20	0.24	0.32	0.15	0.09	0.01	0.06	8.05	0.02
n	9	9	9	9	9	9	9	9	8	8
El Riego – Late Archaic (~4250 cal BP)										
(n=1)	---	6.41	3.20	3.47	---	---	---	---	---	---
El Riego – Early Formative (~3650–3530 cal BP)										
μ	---	6.61	3.13	3.62	---	---	---	---	---	---
σ	---	0.68	0.20	0.61	---	---	---	---	---	---
σ^2	---	0.46	0.04	0.38	---	---	---	---	---	---
n	---	2	2	2	---	---	---	---	---	---
El Gigante – Estanzuela Late Formative (2350–1820 cal BP)										
μ	13.20	10.23	3.91	5.08	1.67	0.92	0.31	1.32	17.14	0.60
σ	1.66	1.88	0.59	0.78	0.28	0.23	0.11	0.31	3.00	0.07
σ^2	2.74	3.52	0.34	0.61	0.08	0.05	0.01	0.10	9.01	0.01
n	15	15	15	15	14	15	15	15	15	15
El Riego – Late Formative (~2290–1800 cal BP)										
μ	---	8.80	3.26	4.77	---	---	---	---	---	---
σ	---	2.19	0.45	0.90	---	---	---	---	---	---
σ^2	---	4.80	0.21	0.80	---	---	---	---	---	---
n	---	4	4	4	---	---	---	---	---	---
El Gigante – Terminal Formative/Early Classic (1730–1620 cal BP)										
(n=1)	22	16.33	3.52	4.60	1.22	1.00	0.27	0.95	22.91	0.71
El Riego – Early Classic (~1720–1410 cal BP)										
μ	---	8.15	3.36	4.50	---	---	---	---	---	---
σ	---	1.01	0.40	0.94	---	---	---	---	---	---
σ^2	---	1.02	0.16	0.89	---	---	---	---	---	---
n	---	10	10	10	---	---	---	---	---	---
El Gigante – Late Classic (1280–1180 cal BP)										
(n=1)	16	13.59	3.51	4.44	1.94	1.00	0.44	1.13	18.63	0.73
El Riego – Postclassic (~930–380 cal BP)										
μ	---	8.62	3.02	5.78	---	---	---	---	---	---
σ	---	4.39	0.42	2.00	---	---	---	---	---	---
σ^2	---	19.28	0.17	4.00	---	---	---	---	---	---
n	---	3	3	3	---	---	---	---	---	---
El Riego – Historic (~160 cal BP)										
(n=1)	---	8.14	3.19	6.28	---	---	---	---	---	---

Table S6. El Gigante Maize cob measurements.

Lab no.	PSU no.	Sample ID	Rows	Rachis diameter	Rachis segment length	Cupule width	Cupule length	Cupule depth	Cupule shape index (l/w)	Cupule wing width	Cob diameter	Rachis/cob index	Cupule hairs?	Cob shape	Fasciated?
UCIAMS-90933	PSU-4732	EG10	12	7.40	3.30	4.10	1.90	1.15	0.46	0.60	---	---	N	conical	N
UCIAMS-128441	PSU-5630	EG70	12	9.00	4.20	4.70	2.00	1.75	0.43	1.50	14.80	0.61	Y	lancelot	Y
UCIAMS-128444*	PSU-5633	EG73	14	4.50	1.80	2.40	1.80	0.75	0.75	0.70	5.80	0.78	N	conical	N
UCIAMS-127387	PSU-5605	EG66	14	9.69	4.40	4.20	2.20	1.00	0.52	1.10	12.48	0.78	N	lancelot	N
UCIAMS-127384	PSU-5602	EG63	14	9.17	3.00	4.00	1.80	1.25	0.45	0.90	14.00	0.66	Y	lancelot	N
UCIAMS-127386	PSU-5604	EG65	14	6.60	3.10	3.20	1.10	0.75	0.34	0.70	10.41	0.63	N	tapered	N
UCIAMS-130720	PSU-5693	EG74	14	9.40	3.60	3.80	1.30	1.00	0.34	1.10	10.00	0.94	N	conical	Y
UCIAMS-130721	PSU-5694	EG75	12	9.73	3.50	3.90	1.80	1.25	0.46	1.00	17.81	0.55	Y	lancelot	N
UCIAMS-93254	PSU-4754	EG14	14	10.10	3.60	4.50	1.50	1.50	0.33	1.00	---	---	Y	conical	Y
UCIAMS-130722	PSU-5695	EG76	12	10.21	4.10	4.70	1.30	1.00	0.28	0.80	17.06	0.60	Y	tapered	Y
UCIAMS-93253	PSU-4753	EG12	14	9.93	3.40	3.20	2.10	1.25	0.66	0.80	15.00	0.66	N	lancelot	Y
Beta-159055**	---	S04	---	---	---	---	---	---	---	---	---	---	---	---	---
UCIAMS-127385*	PSU-5603	EG64	12	8.40	4.10	5.00	2.10	1.00	0.42	1.10	---	---	N	conical	N
UCIAMS-173149	PSU-6945	EG79	12	11.25	4.02	5.59	1.52	0.75	0.27	1.30	18.02	0.62	Y	tapered	N
UCIAMS-128443*	PSU-5632	EG72	14	7.10	3.60	3.20	1.90	0.75	0.59	0.60	9.70	0.73	N	conical	N
UCIAMS-90934	PSU-4733	EG11	14	9.71	4.10	4.00	1.40	1.00	0.35	1.00	18.00	0.54	N	lancelot	N
UCIAMS-90935	PSU-4734	EG13	---	---	---	---	---	---	---	---	---	---	---	---	---
UCIAMS-173151	PSU-6947	EG81	12	8.03	3.68	4.02	1.94	0.75	0.48	0.84	11.04	0.73	N	lancelot	N
UCIAMS-128442*	PSU-5631	EG71	14	9.00	4.00	4.70	2.10	1.00	0.45	1.00	14.10	0.64	N	conical	N
UCIAMS-173153	PSU-6949	EG83	12	11.12	3.83	5.29	1.33	1.00	0.25	1.43	16.73	0.66	N	lancelot	Y
UCIAMS-173150	PSU-6946	EG80	12	9.15	3.22	5.26	1.47	1.00	0.28	1.14	13.98	0.65	N	conical	N
UCIAMS-173159	PSU-6955	EG89	14	10.55	3.81	5.16	1.63	1.50	0.32	1.22	16.92	0.62	Y	lancelot	N
UCIAMS-127383*	PSU-5601	EG62	12	7.40	4.10	3.60	2.30	1.00	0.64	0.60	9.70	0.76	N	conical	N
UCIAMS-173156	PSU-6952	EG86	14	13.90	4.08	5.87	1.41	1.00	0.24	1.43	20.71	0.67	Y	lancelot	N
UCIAMS-173158	PSU-6954	EG88	14	13.07	4.76	6.26	1.79	1.00	0.29	2.04	23.11	0.57	Y	lancelot	N
UCIAMS-173160	PSU-6956	EG90	10	11.16	4.35	6.19	2.13	1.00	0.34	1.02	20.15	0.55	Y	lancelot	N
UCIAMS-173148	PSU-6944	EG78	16	11.16	3.95	4.86	1.46	0.50	0.30	1.22	18.06	0.62	Y	tapered	N
UCIAMS-173155	PSU-6951	EG85	14	8.46	4.28	3.93	---	1.00	0.00	1.81	15.10	0.56	Y	conical	N

Lab no.	PSU no.	Sample ID	Rows	Rachis diameter	Rachis segment length	Cupule width	Cupule length	Cupule depth	Cupule shape index (l/w)	Cupule wing width	Cob diameter	Rachis/cob index	Cupule hairs?	Cob shape	Fasciated?
UCIAMS-173152	PSU-6948	EG82	12	10.04	3.67	5.30	2.09	1.00	0.39	1.46	15.23	0.66	N	conical	N
Beta-171701**	---	S03	---	---	---	---	---	---	---	---	---	---	---	---	---
UCIAMS-93255	PSU-4755	EG15	14	9.00	4.70	5.10	2.00	0.75	0.39	1.50	18.44	0.49	Y	conical	N
UCIAMS-127388*	PSU-5606	EG67	14	7.60	2.90	3.30	1.40	0.75	0.42	0.80	10.42	0.73	N	tapered	N
UCIAMS-127389*	PSU-5607	EG68	14	7.53	2.70	3.50	1.20	0.25	0.34	1.00	9.52	0.79	N	conical	N
UCIAMS-128440	PSU-5629	EG69	12	6.60	3.80	5.30	1.70	0.75	0.32	1.10	14.09	0.47	Y	tapered	N
UCIAMS-173154	PSU-6950	EG84	16	10.18	2.35	3.99	1.44	0.75	0.36	1.22	17.55	0.58	Y	lancelot	N
UCIAMS-173157	PSU-6953	EG87	22	16.33	3.52	4.60	1.22	1.00	0.27	0.95	22.91	0.71	Y	lancelot	N
UCIAMS-173147	PSU-6943	EG77	16	13.59	3.51	4.44	1.94	1.00	0.44	1.13	18.63	0.73	Y	lancelot	N
Beta-171701**	---	S03	---	---	---	---	---	---	---	---	---	---	---	---	---
UCIAMS-93255	PSU-4755	EG15	14	9.00	4.70	5.10	2.00	0.75	0.39	1.50	18.44	0.49	Y	conical	N
UCIAMS-127388*	PSU-5606	EG67	14	7.60	2.90	3.30	1.40	0.75	0.42	0.80	10.42	0.73	N	tapered	N
UCIAMS-127389*	PSU-5607	EG68	14	7.53	2.70	3.50	1.20	0.25	0.34	1.00	9.52	0.79	N	conical	N
UCIAMS-128440	PSU-5629	EG69	12	6.60	3.80	5.30	1.70	0.75	0.32	1.10	14.09	0.47	Y	tapered	N
UCIAMS-173154	PSU-6950	EG84	16	10.18	2.35	3.99	1.44	0.75	0.36	1.22	17.55	0.58	Y	lancelot	N
UCIAMS-173157	PSU-6953	EG87	22	16.33	3.52	4.60	1.22	1.00	0.27	0.95	22.91	0.71	Y	lancelot	N
UCIAMS-173147	PSU-6943	EG77	16	13.59	3.51	4.44	1.94	1.00	0.44	1.13	18.63	0.73	Y	lancelot	N

All measurements reported in millimeters

Reported values for rachis segment length, cupule width, cupule length, cupule depth, and cupule wing width represent the average of measurements from at least 3 separate ranks