Supplementary Material

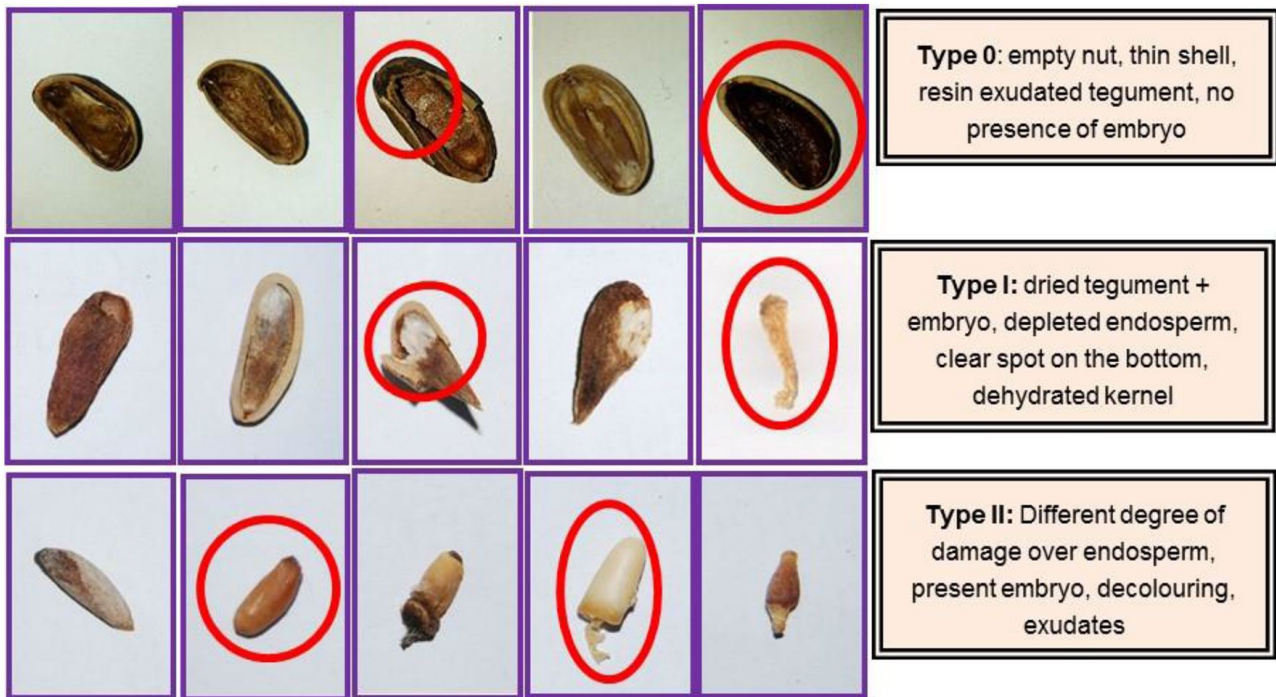**Tab. S1** - Main ecological attributes of the four analysed regions.

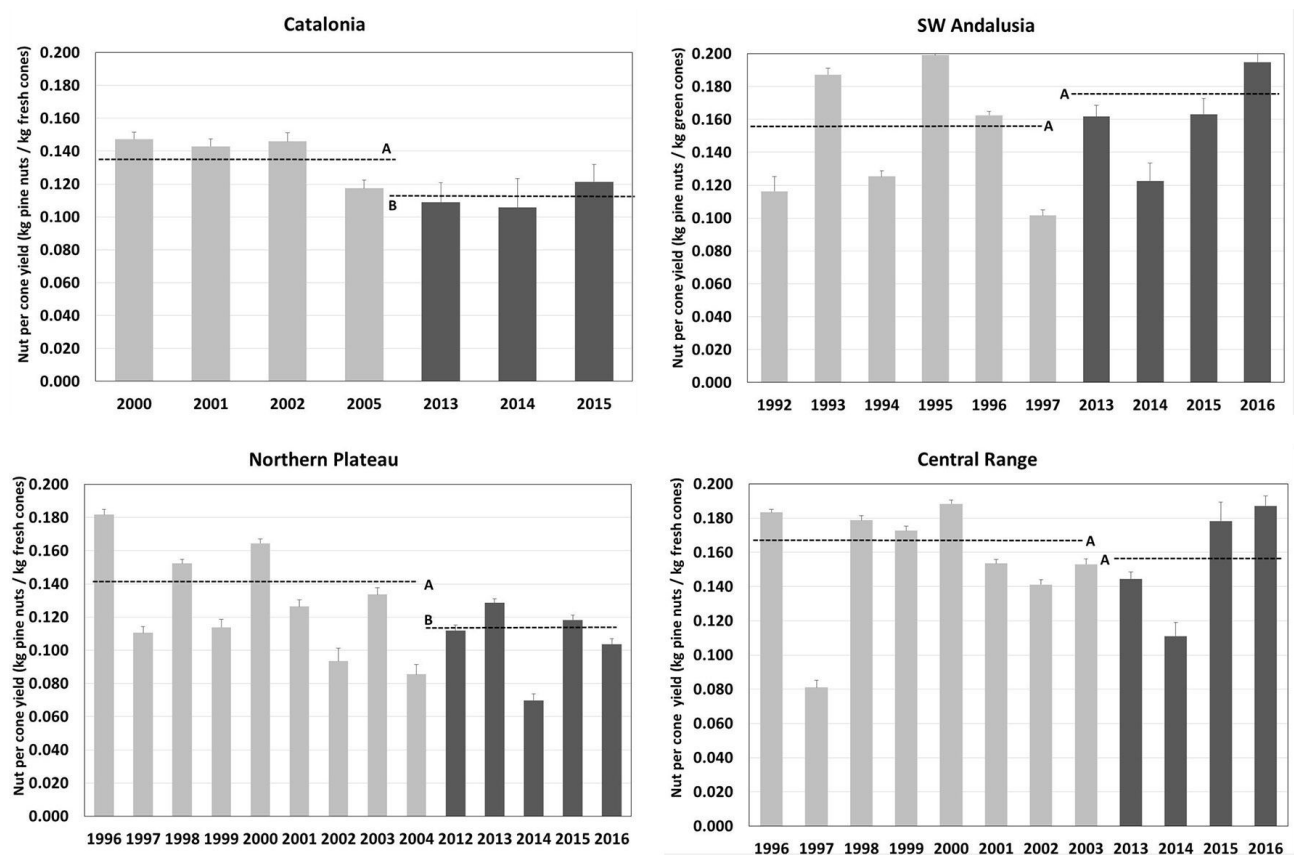| Attribute	Catalonia	SW Andalusia	Northern Plateau	Central Range
Total area occupied by the species(ha)	50,000	100,000	70,000	30,000
Altitude (m)	0 – 600	0 – 200	600 - 900	600 – 1000
Annual rainfall (mm)	600 – 850	450 – 750	350 – 600	500 – 1000
Average annual temperature (ºC)	11.7 – 16-7	16.0 – 18.5	10.5 – 13.5	12.2 – 15.3
Soil type	Sandy	Sandy	Sandy Lime	Sandy, with abundant rocks
Lithology	Granitic	Marine & alluvial sediments	Alluvial & eolic sediments Limestone	Granitic
Orography	Steep slopes	Flat areas	Flat areas	Steep slopes
Forest structure	Mixed Multiaged	Pure Even-Aged	Pure Even-Aged	Mixed Multiaged
Main ownership	Private	Public	Public	Public
Traditional use	Timber production	Timber production Soil protection	Timber & Cone production	Cone production Livestock

Tab. S2 - Number of plots annually sampled and sets annually processed for the four regions in both historical and recent surveys. (*): kernel content analysis was not carried out.

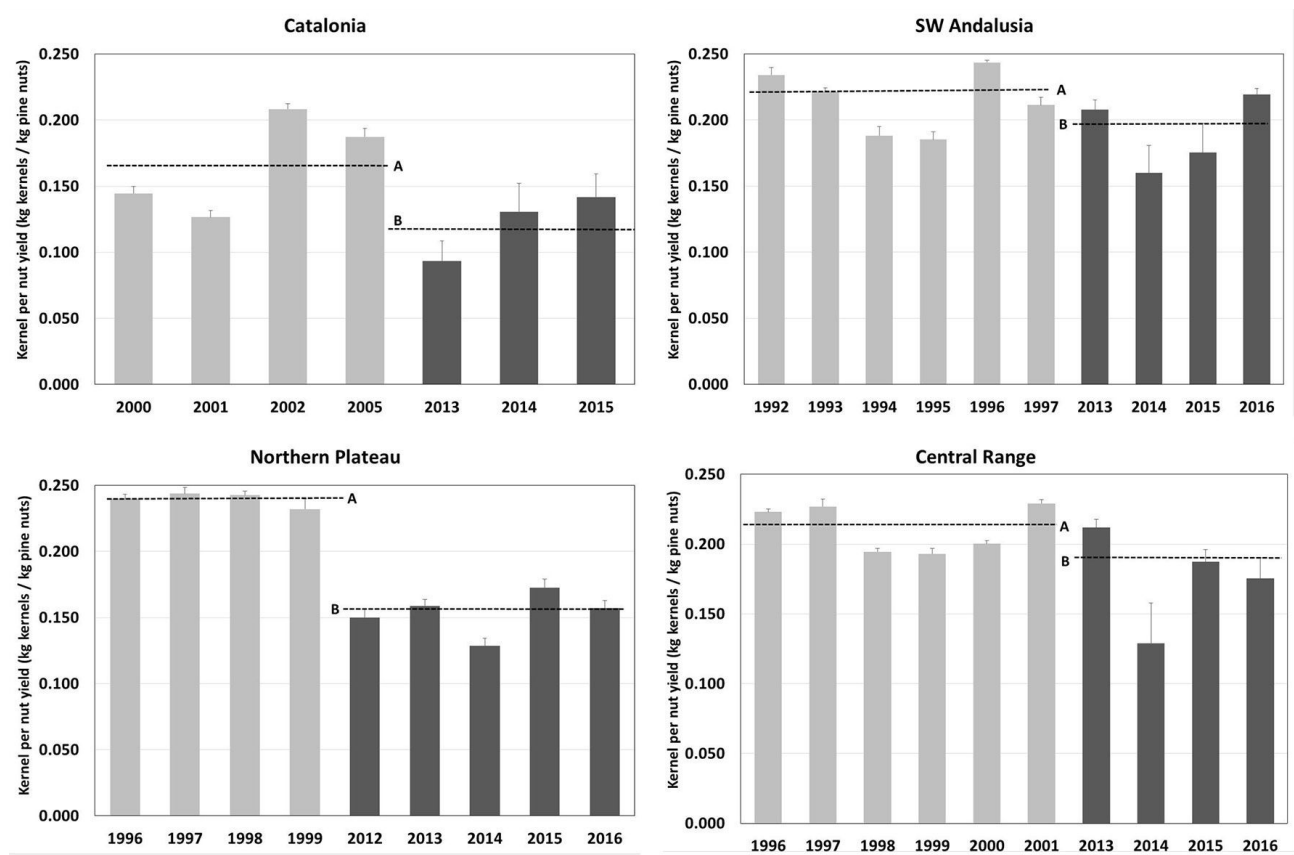| Surveys	Period	Catalonia		SW Andalusia		Northern Plateau		Central Range	
		Plots	Sets	Plots	Sets	Plots	Sets	Plots	Sets
Historical surveys	1992-93	-	-	17	76	-	-	-	-
	1993-94	-	-	18	104	-	-	-	-
	1994-95	-	-	28	128	-	-	-	-
	1995-96	-	-	33	214	-	-	-	-
	1996-97	-	-	44	351	22	148	49	208
	1997-98	-	-	39	167	22	121	36	108
	1998-99	-	-	-	-	20	105	43	140
	1999-00	-	-	-	-	15	47	45	179
	2000-01	32	123	-	-	19	100*	48	223
	2001-02	28	92	-	-	19	77*	45	171
	2002-03	26	92	-	-	15	50*	42	172*
	2003-04	-	-	-	-	17	64*	41	174*
	2004-05	-	-	-	-	14	42*	-	-
	2005-06	28	115	-	-	-	-	-	-
	Average	28.5	105.5	29.8	173.3	18.1	83.8	43.6	171.9
Recent surveys	2012-13	-	-	-	-	20	100	-	-
	2013-14	6	12	6	13	30	165	10	32
	2014-15	5	9	5	10	37	122	3	6
	2015-16	8	15	6	6	36	93	3	9
	2016-17	-	-	5	10	31	108	3	9
	Average	6.3	12	5.5	9.8	33.5	122	4.8	14

Fig. S1 - Different typologies of damaged pine nuts and kernels.

Fig. S2 - Interannual differences in Nuts per Cone Yield for each studied region. Light grey bars refers to historical campaigns, dark grey bar to recent campaigns. Dashed line indicates average value for the period. Uppercase letter indicate differences between periods for the same region.

Fig. S3 - Interannual differences in Kernel per Nut Yield for each studied region. Light grey bars refers to historical campaigns, dark grey bar to recent campaigns. Dashed line indicates average value for the period. Uppercase letter indicate differences between periods for the same region.

Fig. S4 - Influence of Cone Fresh Weight on number of pine nuts per cone. Black lines represents recent campaigns, while grey lines represents historical campaigns. ***, **, * represents significant differences at p-value < 0.0001, <0.01 and <0.05 respectively, between periods for a given class of cone fresh weight. "n.s" indicates nonsignificant differences between periods for a given class of cone fresh weight.