

STUDY OF AGRONOMICAL BEHAVIOR AND QUALITY CHARACTERISTICS OF SOME SEED-GROWN GLOBE ARTICHOKE CULTIVARS (*CYNARA SCOLYMUS* L.) IN THE SOUTHEAST OF SPAIN.

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INTRODUCTION

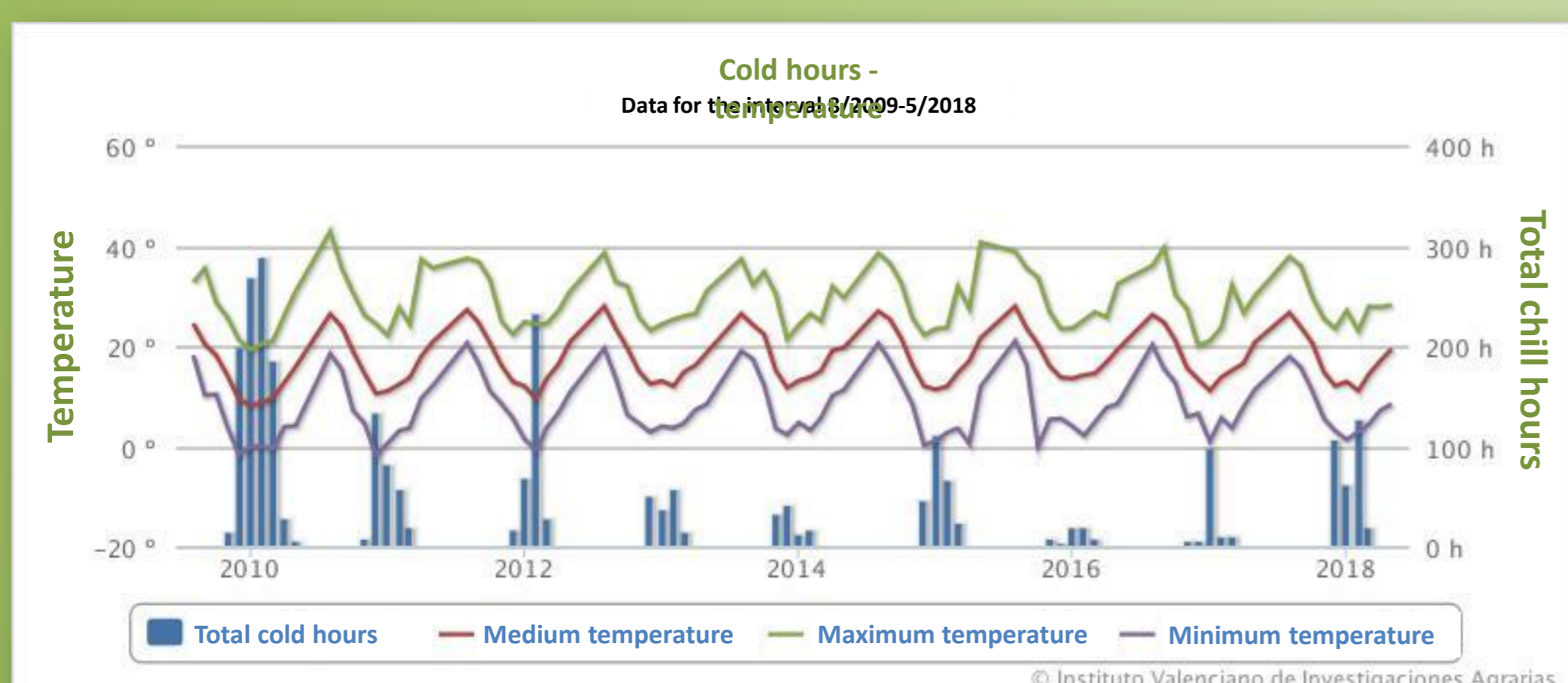
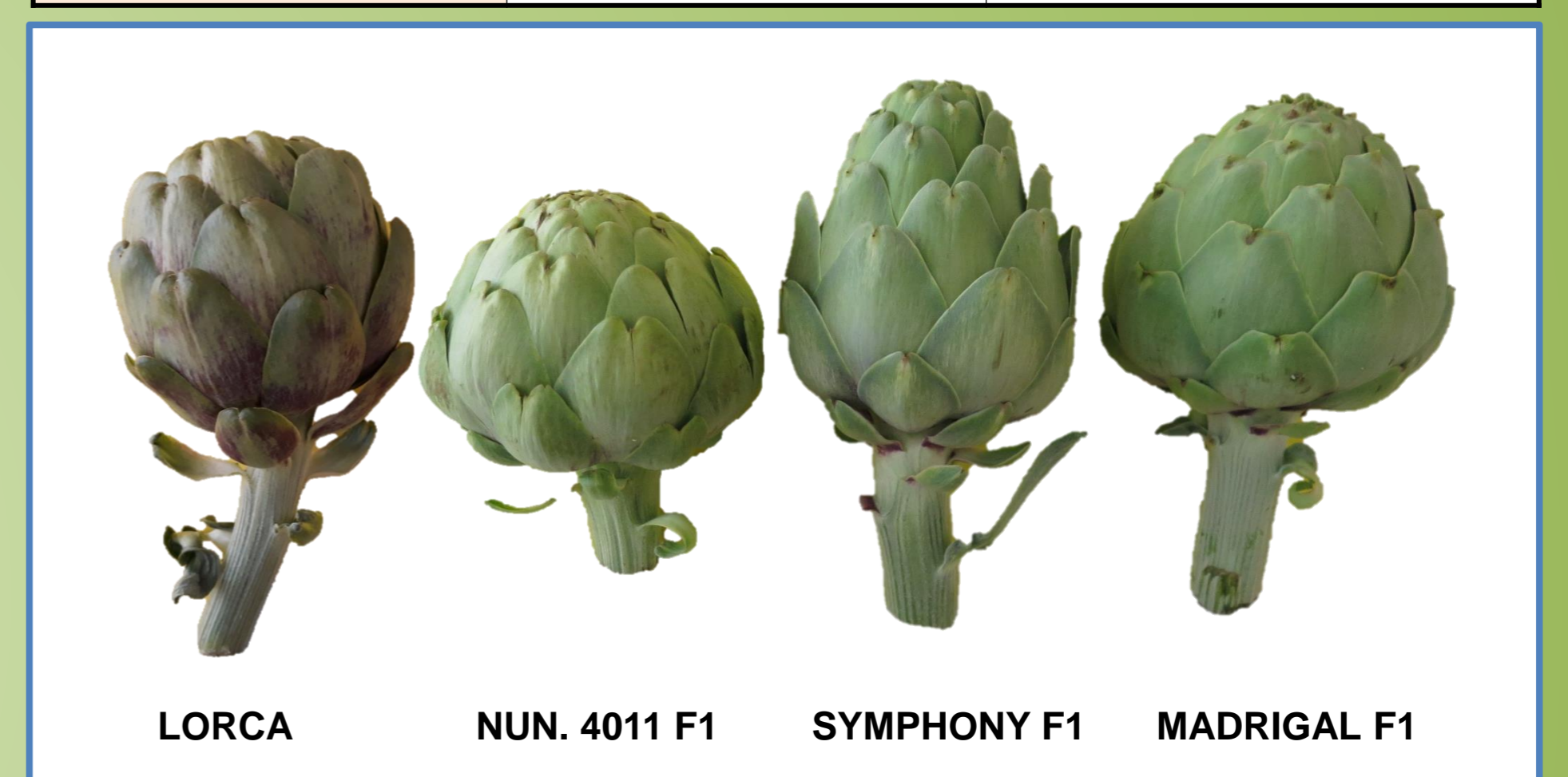
Artichoke is a perennial herbaceous plant native to the Mediterranean region, from which it has spread into other parts of the world that have mild or moderate climates. The top globe artichoke varieties cultivated in Spain ,are 'Blanca de Tudela' (the most planted) and 'Calico' (late and big size variety), vegetatively propagated, mainly for export purposes. During the last decades the total cumulative yields at the end of the cycle are descending due to the plants tend to lose vigor after years of regrowth and high level of soil fatigue. Recently, some larger commercial companies have developed interesting new seed-propagated genotypes, but to initiate bud development, plants require sufficient chilling exposure, which is generally 250 to 500 hours; although bud formation must be artificially induced to produce artichokes with the use of Gibberellic acid (GA). The aim of this study is to compare agronomic and quality characteristic of seed grown varieties cultivated in the agronomical conditions of southeast Spain.

MATERIALS AND METHODS

An eight years experiment (2009-2018) located in the Agricultural Experiment Station of Elche (Alicante, Spain; 38° 11' N 0° 41' W). was carried out with four globe artichoke cultivars (Table 1). Field experiments were in single row of plants, in-row spacing of 80 cm and widths between rows of 1.67 m. The most significant meteorological data during the study period were obtained from the same agro-meteorological station (Fig 1). Plantation was made last week of July. Plants were sprayed was treated three times (every 14 days) with Gibberellic acid (GA3) with a concentration of 30 mg.L⁻¹ in early varieties (Lorca and Nun.4011) and 60 mg.L⁻¹ in medium-late varieties (Symphony and Madrigal) for stimulating plants to enhance precocity. Treatments started when plants had 7-8 leaves. Number and weight (g) of heads harvested weekly were determined.

Table 1:

VARIETY	TYPE	SEED PRODUCER
LORCA	Open pollination	RAMIRO ARNEDO
NUN. 4011 F1	Hybrid	NUNHEMS
SYMPHONY F1	Hybrid	NUNHEMS
MADRIGAL F1	Hybrid	NUNHEMS



*Chilling hours ($t^{\circ} < 7^{\circ}C$)

Figure 1: Maximum, minimum and mean monthly temperatures and chill hours in Elche (Spain) during the period 2010-2018

YEAR	CHILL HOURS	YIELD			UNMARKETABLE	
		Kilos	Heads	Weight (g)	Kilos	Heads
2009-10	989,5	4,22 a	23,33 a	182 b	0,21 d	2,96 d
2010-11	298,5	4,10 a	19,79 bc	206 a	0,43 bc	4,43 bcd
2011-12	345,5	3,55 b	21,86 ab	162 cd	0,18 d	2,66 d
2014-15	250,0	3,37 b	19,74 bc	170 bc	0,45 bc	5,00 bcd
2017-18	315,0	3,09 bc	17,50 cd	178 b	0,57 ab	6,21 ab
2013-14	102,0	2,73 cd	20,30 bc	137 e	0,28 cd	4,16 cd
2012-13	160,0	2,49 de	15,39 de	164 cd	0,25 d	4,49 bcd
2015-16	56,5	2,19 e	14,19 e	153 d	0,63 a	7,63 a
CV		16,58	15,49	8,27	42,64	43,08
MDS		0,54	2,96	14,02	0,16	2,03

Figure 3: Comparison between the annual accumulation of chill hours using hourly temperature and of annual yield (kg/plant) and number of heads in globe artichoke.

*Means followed by the same letter are not significantly different according to LSD-test at $P \leq 0.05$.

RESULTS

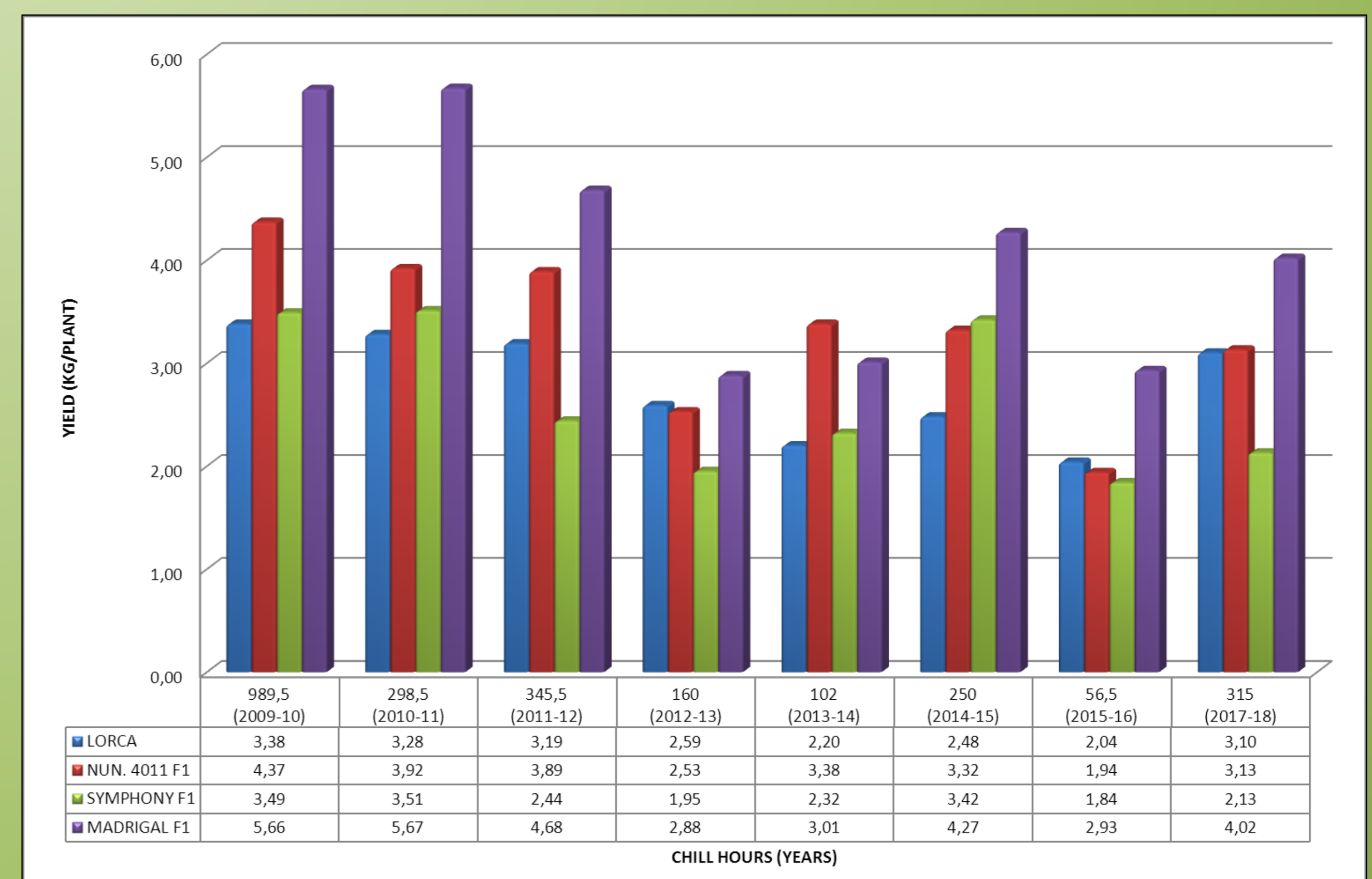


Figure 2: Annual yield (kg/plant) of globe artichoke cv. 'Lorca', 'Nun.4011', 'Symphony' and 'Madrigal' cultivated in Elche, Spain.

CONCLUSIONS

The total cumulative yield at the end of the cycle was significantly correlated with chilling hours, especially in Madrigal F1. Gibberellic acid treatment improved synchronicity in the earliest season varieties. On the basis of our results some selected F1 hybrid globe artichoke varieties will be able to increase their market share in Spain.