Horticultural Performance of Native White Chilean Strawberry in San Pedro, Metropolitan Region of Chile

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During the 2001–02 growing season, a field experiment was planted in the winter in the county of San Pedro, Metropolitan Region (33° 58'S; 71° 29'W), where 40% of the commercial strawberry (*Fragaria* × *ananassa*) production is

concentrated in Chile. The aim of the experiment was to evaluate the horticultural performance of native white Chilean strawberry (*F. chilensis*) to establish the possibility of introducing this species as a new crop for small land owners.

Materials and Methods

Three widely grown commercial strawberry varieties ('Camarosa', 'Seascape', and 'Selva')

Table 2. Fruit yield per plant (fresh weight in g) and number of crowns per plant in five *Fragaria* genotypes [three cultivars of *F. ×ananassa* (Duch.) and two accessions of *F. chilensis* (L.) Duch.]. Values are average of four replications per treatment.

Table 1. Dry matter per plant (DMPP) and proportions (%) partitioned into leaves, crowns, roots, flowers/fruit, and stolons in five *Fragaria* genotypes [three cultivars of *F. ×ananassa* (Duch.) and two accessions of *F. chilensis* (L.) Duch.].

Germplasm	DMPP ^z (g)	Proportion of dry matter (%) ^y				
		Leaves	Crowns	Roots	Flowers/fruit	Stolons
<i>F. ×ananassa</i>						
Camarosa	56.7 a ^z	69.1	11.9	14.8	4.2 b	0 c
Seascape	35.5 b	68.2	13.1	12.9	5.8 ab	0 c
Selva	26.4 b	63.0	15.9	13.1	8.0 a	0 c
<i>F. chilensis</i>						
97PUR 1-A	20.5 b	65.8	15.1	12.9	0.4 c	5.8 b
94 BAU 1-A	32.6 b	62.7	12.8	13.0	0.6 c	10.9 a
Significance	*	NS	NS	NS	**	**

^zValues are average of four replications per treatment.

^yAnalysis based on data transformed through the arcsin V (%) function.

^zAverages followed by different letters in a column differ statistically by Duncan's test.

NS, **, *Nonsignificant or significant at $p \leq 0.05$ or 0.01 , respectively.

Germplasm	Yield/plant (g)	Crowns/ plant
<i>F. ×ananassa</i>		
Camarosa	9.2 b ^z	5.0 a
Seascape	9.9 ab	3.8 ab
Selva	12.5 a	3.5 ab
<i>F. chilensis</i>		
97PUR1-A	0.8 c	2.3 bc
94BAU1-A	2.0 c	1.8 c
Significance	**	**

^zAverages followed by different letters in a column differ statistically by Duncan's test.

**Significant at $p \leq 0.01$.

Fig. 1. Seasonal fruit production per plant in five genotypes of *Fragaria* [three *F. ×ananassa* cultivars ('Camarosa', 'Seascape', and 'Selva') and two *F. chilensis* accessions (97 PUR1A and 94 BAU 1A)].

and two accessions of *F. chiloensis* grown by small farmers in southern Chile (97PUR-1A and 94BAU-1A; Lavín and Maureira, 2000), were evaluated for growth, fruit quality, carbohydrate partitioning, and fruit production throughout the season. Ten plants in each of four replications were set in the field in May 2001 on 30-cm-high and 80-cm-wide beds at 40 cm distance among plants. A plastic mulch (80 µm in thickness; white on top, black on the bottom) was used to preclude weeds. Plants were drip irrigated according to needs established through a Class A evaporimeter. Standard horticultural practices used for growing commercial strawberries in Chile were employed throughout the season (Villagrán, 2001). No major pest or diseases were detected. Fruit were collected every 3 to 5 d, from six plants in the central sector of each replication. Stolons were removed throughout the season within one week of their emergence. In each replication, five plants were removed from the field in May 2002, separated by plant part and the dry weight of each group was determined after drying in a forced draught oven at 72 °C until constant weight.

Results and Discussion

Even though clones of *F. chiloensis* have

been reported as having higher photosynthetic rates than *F. ×ananassa* (Cameron and Hartley, 1990), in our experiment, the Camarosa variety (*F. ×ananassa*) had the highest dry matter production and there were no differences among other *Fragaria* genotypes. These results might be explained by the effect of fruit load on total carbohydrate production, since research on *F. ×ananassa* (Choma et al., 1982; Lenz, 1974) has shown that the presence of fruit induces higher photosynthetic rates. The *F. ×ananassa* cultivars assigned a significantly higher proportion of carbohydrates to flowers and fruits while most carbohydrates in *F. chiloensis* were partitioned towards the stolons (Table 1); this might be an ecological strategy of *F. chiloensis* to occupy the available space (Lavín and Maureira, 2000). Stolon removal in *F. ×ananassa* with propensity for runnering has been shown to significantly increase early yields (Albregts and Howard, 1986). Fruit and crown production, as well as fruit size were significantly higher for *F. ×ananassa* varieties (Table 2); Hancock (1999) has mentioned that fruiting restricts dry matter accumulation in other organs. Soluble solids levels were statistically similar for all *Fragaria* genotypes (from 9.3 to 10.2 °Brix; data not presented). *F. ×ananassa* cultivars had a fruit production

season of about 6 months as compared to 6 to 7 weeks in *F. chiloensis* genotypes. Commercial strawberry cultivars had two fruit production peaks, while *F. chiloensis* accessions had only one (Fig. 1).

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