PERFORMANCE OF COMMERCIALLY AVAILABLE STRAWBERRY CULTIVARS IN ORGANIC PRODUCTION FIELDS.

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A small amount of California's strawberry acreage is grown organically. In 1997, 1 % of California strawberries were produced organically. In the years since then strawberry acreage has steadily increased. According to CCOF (California Certified Organic Farmers, the leading California organic certification agency) the number of CCOF certified strawberry growers has increased from 18 to 34 (CCOF 1993, 1999), with a similar increase in total acreage in California.

The success that organic growers have experienced has been in spite of a virtual absence of scientific research and extension. Although choice of variety is very important for success, a study to determine how strawberry cultivars perform in organic production fields is non-existent and farmers are left to extrapolate from conventional systems. The overall goal of our cooperative research project is to provide farmers with research conducted in an explicitly organic setting so that they can make informed choices about cultivar selection, microbial treatments, and disease management issues. Here we report on the performance of commercial cultivars grown in organic production fields.

Methods: Older cultivars and currently available high yielding cultivars were evaluated in organic production fields in the central coast region of California. Cultivars Aromas, Capitola, Carlsbad, Diamante, Douglas, Hecker, Irvine, Pacific, Pajaro, Seascape, Selva, and Sequoia were evaluated. Experiments were conducted during two growing seasons at three locations. The sites were located in Monterey, Santa Cruz and San Benito Counties. Experiments were designed and analyzed as Randomized Complete Block experiments with four replications of each cultivar. Planting material was obtained from California nurseries. Planting dates for each cultivar differed so that each cultivar received optimum chilling as recommended by the nurseries from which they were obtained. Plants were planted in certified organic production fields in the fall of 1999 and harvest began in April 2000. Berries were harvested once a week with cull and market quality fruit being weighed separately. Yield was evaluated on 20 plants for each replication. Throughout the production cycle plants were evaluated for disease. Data from the 2000-2001 field season is still being collected and analyzed.

Results and conclusions: Aromas, Pacific, and Seascape consistently performed the best in trials conducted in organic production fields (Table 1). Aromas was one of the top three performing cultivars in all experiments. Yields from Pacific and Seascape placed them among the top four or five performing cultivars in all experiments. Yields from Selva also placed this cultivar in the top five performers in all three experiments but Selva was never the top or second highest yielding cultivar. Diamante was the highest yielding cultivar in one experiment but was fifth and eighth in the two additional

experiments. According to the average of the rankings across all experiments, Aromas, Pacific, and Seascape were the best performers in organic production fields in the 1999-2000 production season.

At location 1 Diamante performed best followed by Aromas, Selva, Pacific, and Seascape (Figure 1). There were no significant differences in yield among cultivars Diamante, Aromas, Selva, Pacific, and Seascape at this location. Diamante is the cultivar that this grower uses in his conventional operation and his growing methods may be adapted for success with this cultivar. This location had been certified organic for only three years and the grower had the least experience with organic production.

At the second location, Seascape had the highest yields followed by Pacific and Aromas (Figure 2). Market and total yields for Seascape were significantly higher than the market and total yields for Diamante. The yields for Aromas Pacific, Seascape and Selva did not differ significantly. The grower at location 2 is one of the premier organic strawberry producers in California and has been producing organic strawberries for over 10 years.

At location three, Aromas had the highest yields followed closely by Pacific (Figure 3). These two cultivars had significantly greater market and total yields than Selva and Diamante. Diamante's yield was significantly lower than the Selva's. Market and total yields did not differ greatly in this location because this organic grower sells directly to his customers and sells berries that would deteriorate if shipped. This location has been managed organically for 10 years and the grower used a broccoli rotation prior to planting strawberries. The other growers did not use a broccoli rotation prior to strawberries.

Soil was evaluated for the presence of soilborne pathogens at the beginning of the season. In the 1999-2000 growing season, *Verticillium dahliae* was not detected in soil at any of the locations prior to planting. Each location either had a long rotation or a broccoli rotation prior to the strawberry planting. During the season no plant loss due to disease was detected in these fields. At most two plants died or stopped bearing fruit in a given plot. *Verticillium dahliae* was not detected when we attempted to isolate the pathogen from weak plants. The plants that did die were lost at the beginning of the season and the loss was primarily due to transplant problems or gophers.

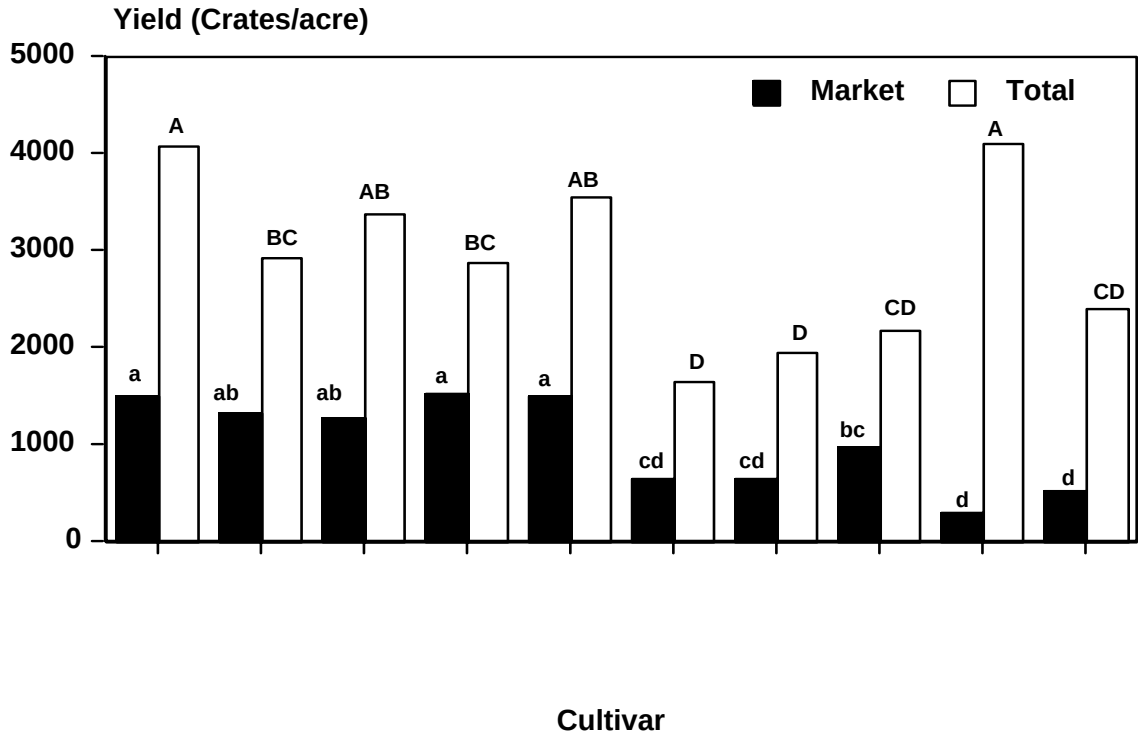
There were very low incidences of fruit and foliar diseases at all locations so these problems were not systematically evaluated. Location 3 had a short and inconsequential outbreak of powdery mildew late in the season. No abiotic disorders were detected in these fields during the season.

Table 1. Ranking of top five cultivars in organic production.

	Location 1	Location 2	Location 3	**Total of rankings**
Aromas	2	3	1	**6**
Pacific	4	2	2	**8**
Seascape	5	1	3	**9**
Irvine	NT	NT	4	**NT**
Selva	3	4	5	**12**
Diamante	1	5	8	**14**

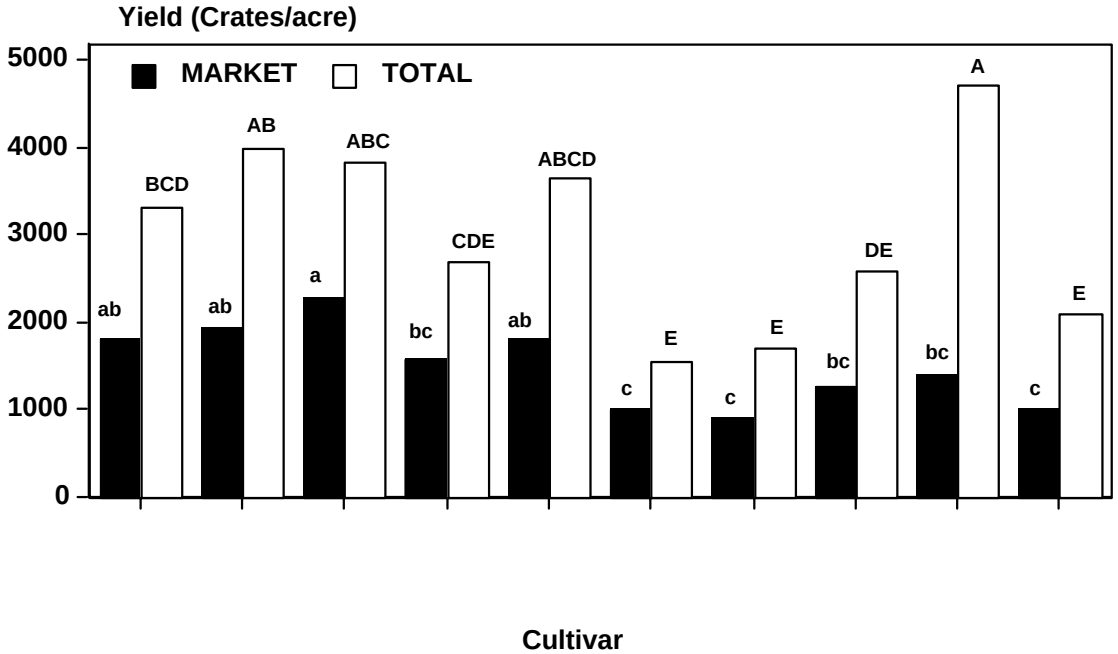
A rank of 1 indicates the highest yielding cultivar.
NT = Not tested
Cultivars with the lowest total rankings performed best under organic production conditions.

Figure 1. Yield of strawberry cultivars grown under organic management, location 1.



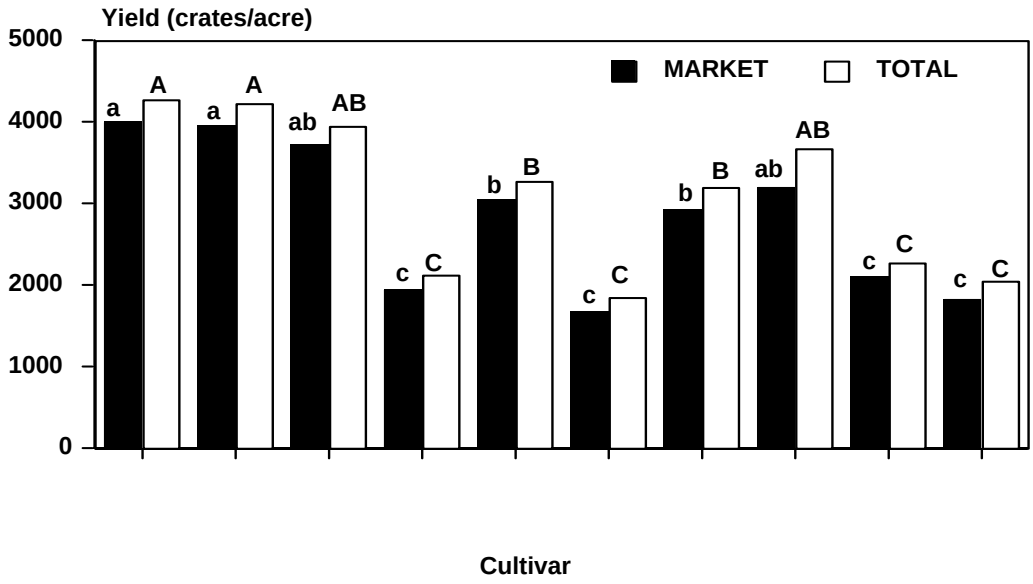
Market and total yields were analyzed separately.
Means having the same letters were not significantly different at the *P*=0.05 level according to Tukey's HSD.

Figure 2. Yield of strawberry cultivars grown under organic management, location 2.



Market and total yields were analyzed separately.
Means having the same letters were not significantly different at the *P*=0.05 level according to Tukey's HSD.

Figure 3. Yield of strawberry cultivars grown under organic management, location 3.



Market and total yields were analyzed separately.
Means having the same letters were not significantly different at the *P*=0.05 level according to Tukey's HSD.