



# Field Notes

Vegetable and Row Crop Newsletter

142A Garden Hwy., Yuba City, CA 95991 ~ Tel (530) 822-7515 ~ Fax (530) 673-5368

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### 2003 COMPARISON OF DIRECT-SEEDING AND TRANSPLANTING, ACROSS 18 VARIETIES

The Colusa extension office has been conducting field tests on the interaction between tomato varieties and the method of planting (direct-seeded versus transplanted) for several years. Earlier test results indicate that direct-seeded crops often have higher yields than the same variety transplanted under very similar (but not necessarily identical) growing conditions. In 2003, field tests were initiated in two commercial production fields (one direct-seeded, one transplanted) in southern Colusa County.

Four one hundred foot long replicated plots of the same 18 varieties were planted in both locations (Table 1). Technical and practical problems complicate direct comparisons in the same field, so the tests were in separate fields, but geographically close and grown

by the same farmer (Poundstone Brothers). The direct-seeded field emerged in late-March and the transplants were placed in the field in early-May. Fruit from both test sites were taken to a State Grading Station 1-2 days prior to harvest for quality analyses. Both tests were harvested with a commercial harvester to collect yield data. The direct-seeded test was harvested on August 18 and the transplant test on September 16. Both tests experienced production-related problems. The direct-seeded test was infected with bacterial speck early in the season and subjected to unseasonable rainfall later. The transplant test experienced the same untimely rainfall, but then received high air temperatures, as well. The data should be examined with caution, because of soil, environmental, etc. differences. However, considered in the context of previous information and looking at trends rather than absolutes, may provide useful information.

**TABLE 1.** YIELD AND FRUIT QUALITY RESULTS FROM 2003 COLUSA COUNTY DIRECT-SEEDED AND TRANSPLANTED MID-MATURITY VARIETY TEST

<u>VARIETY</u>	<u>YIELD/ACRE</u>		<u>SOLUBLE SOLIDS</u>		<u>FRUIT COLOR</u>	
	<u>(TONS)</u>		<u>(%)</u>		<u>(LED)</u>	
	<u>TRANS</u>	<u>DIRECT</u>	<u>TRANS</u>	<u>DIRECT</u>	<u>TRANS</u>	<u>DIRECT</u>
H 2801	36.3	25.5	6.4	6.1	21.5	22.5
PX 849	34.8	25.0	5.6	6.3	26.3	25.3
H 8892	34.7	26.6	5.4	5.7	23.0	23.5
H 2501	34.6	24.2	6.1	5.8	24.0	23.8
AB 5	34.1	29.0	5.8	6.2	24.0	26.0
U 941	33.7	23.9	5.4	6.1	23.5	24.0
H 9780	30.9	29.2	6.0	5.8	24.0	25.3
AB 2	29.8	28.2	5.9	6.1	23.5	25.3
PS 296	28.9	33.0	6.0	5.3	25.8	27.3
Halley 3155	27.7	26.3	6.0	6.1	25.5	25.5
HM 0830	26.1	27.7	5.7	6.2	24.3	26.0
H 2601	25.2	22.6	5.5	5.6	22.8	26.3
CXD 222	24.8	26.0	5.9	5.7	22.3	24.3
CPL 155	23.3	29.6	6.4	6.1	25.3	27.8
NDM 0098	23.2	30.1	5.7	5.6	22.5	24.0
CXD 221	21.3	25.4	6.5	6.2	24.3	25.5
La Rossa	21.2	20.7	5.8	5.6	23.3	24.8
LSD <sub>0.05</sub>	5.9	6.4	0.3	0.4	1.7	1.6
C. V. (%)	14.4	17.5	3.3	5.0	5.0	4.5
<b><u>AVERAGE</u></b>	<b><u>28.9</u></b>	<b><u>25.8</u></b>	<b><u>5.9</u></b>	<b><u>5.9</u></b>	<b><u>23.8</u></b>	<b><u>25.2</u></b>

**discussion:** *yields*- In these tests, on the average, transplants slightly out-yielded direct-seeded varieties. It is interesting to note the differences between relative rankings of the 17 varieties within each of the tests. The top yielding variety in the transplant test (H 2801) was only “middle-of-the-pack” in the direct seeded test. Conversely, the top yielder in the direct-seed test (PS 296) was in the middle of the yields in the transplant test. The yield rankings are very different for many varieties. That suggests different varietal responses indifferent growing or planting situations and may be useful information. One variety, La Rossa, did relatively poorly in both locations. That variety is a pear-type, which have not historically performed well under our growing conditions.

*soluble solids*- The average soluble solids were the same for both locations. However, as for yields, it is interesting to look at relationships both within and between tests. Generally, we expect an inverse relationship between fruit yield and soluble solids (*i.e.* - if one is high, the other is low). However, there are some notable exceptions here. The highest yielding variety in the transplant test (H 2801) was also among the highest soluble solids. This is desired, as there are rewards for both the grower (high yield) and the processor (high solids). A more usual situation is CXD 221 in the direct-seeded test, with the highest solids and one of the lower yields. Another interesting comparison is the solids of the same variety in the different tests. PX 849 is a good example, having low solids in the transplant test and high solids when direct-seeded.

In many cases, the varieties respond differently, while in some they are consistent.

*fruit color*- This is a measurement made by the grading station and is reported as a numerical value. Lower numbers indicate more “redness” than higher numbers. Differences between the same variety in the two different tests are relatively small. In general, the direct-seeded test had poorer fruit color than the transplant test, which may be partially a function of the time of fruit maturity.

**summary:** Both transplanting and direct-seeding are commonly used for stand establishment in the local area, with transplant usage increasing. Each have appropriate applications, depending on environmental conditions, production technology, planting time, delivery scheduling and other factors. It is likely that specific varieties will respond differently to the planting method used and seed companies, growers and processors need to take advantage of these differences.

## OPPORTUNITY KNOCKS

Sometimes we learn things from field test plots that we did not set-out to discover. Such was the case in the direct-seeded variety test described above. This field received substantial rainfall on multiple dates during the early growth period (late-April). A result of this untimely moisture was the development of significant visual symptoms of bacterial speck (*Pseudomonas syringae*) throughout the field, including the variety test area. Interestingly, the field variety (H9557) is touted as having speck resistance. The speck organism is known to mutate to new races which have not been included in plant breeding programs, and that is likely what occurred here. Based on disease symptom severity, a copper fungicide test was initiated. There were no resulting fruit yield or quality differences between treatments, but we also rated the variety test entries for speck symptoms. Extension Plant Pathologist, Mike Davis, blind-rated the plots, using subjective categories of low, medium and high disease visual symptoms. No attempt was made to statistically analyze the ratings, and they should be viewed with this in mind. They did fall into several groupings, which may be useful information.

**TABLE 2. 2003 MID-MATURITY DIRECT-SEEDED VARIETY TEST BACTERIAL SPECK RATINGS.**

*Low symptoms\** (rating of <2); AB5, H2801, CXD221, AB2, H2501, U941, Halley 3155

*Medium symptoms\** (rating of 2-4); H2601, H9780, NDM0098, PS296, PX849, CPL 1558

*High symptoms\** (>4); SUN 6119, HM830, H8892, La Rossa, CXD222

\*Rated late-August using a subjective scale of 0-5; 0= no symptoms present, 5= foliage covered with lesions.

MIKE MURRAY  
ROW CROP ADVISOR