YIELD TRIAL OF EARLY HYBRIDS

TOMATO SOLUTIONS

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2013

SUMMARY

The yield, quality, and maturity of the early maturing hybrids TSH04, TSH28, and H5108 was compared under commercial conditions using twin rows (13,074 plants/acre) with the ripening agent Ethrel applied at the optimum time for each hybrid. Under the cooler conditions of 2013, maturity in days from planting to harvest was as follows: TSH04-97 days, TSH28-101 days, and H5108-104.3 days. Yield of TSH04 and H5108 were comparable when adjusted for days to harvest and soluble solids content. Yield of TSH28 was slightly lower but fruit size and soluble solids were significantly higher. TSH28 also has an intense red colour. Depending on growing conditions, yield of TSH28 could probably be boosted to the same level as TSH04 or H5108 by planting slightly higher populations in the field. All three hybrids provided good peeled quality with some minor differences. H5108 had thinner juice which will affect products such as tomato juice, sauce, or paste, but not whole pack.

INTRODUCTION AND PURPOSE:

This trial was set up for a detailed comparison of 3 early hybrids (TSH04, TSH28, and H5108) on twin rows. In our breeding program, replicated yield trial data is based on single 4' rows which is not the standard commercial spacing. Also, we do not use Ethrel due to the complications this would involve. We wanted to determine commercial yield performance using standard commercial plant spacing for these 3 common hybrids with early maturity. In particular, we wanted to establish relative maturity differences when Ethrel is used since this is the standard commercial practice.

METHODS:

The soil was very sandy and not irrigated, but followed a tillage radish crop. Initially, the trial was set up with 4 replicates, with spray rows that were not part of the trial, but planted with the same hybrids. Due to frost damage after planting, we used some of these spray rows for yield data. We were able to replant two plots completely with surplus plants, and were able to fill in a few gaps by moving plants. Final plant growth in each plot was very uniform. Plant population was 13,074 plants per acre, using twin rows 16" apart, on 60" centres. Plant spacing was 16". Chlorothalonil (Bravo or Echo) was applied every 7-10 days. Ethrel was applied at the optimum time for each plot using the same rate on all hybrids (1.18 L/acre - 78% of the label rate). Yields were excellent for these conditions as we had good uniform rainfall throughout the growing season. Harvesting commenced as soon as it appeared that the optimum stage for machine harvest

had been reached for each hybrid and planting date. We ended up with 4 replicates of TSH04, and 6 replicates of both TSH28 and H5108. No statistical analysis was done, however data was consistent between the different reps. This was an excellent year to show maturity differences which are enhanced by cooler than normal weather.

PRESENTATION OF DATA:

HYBRID	GROWING DAYS (from transplanting to harvest)	TOTAL YIELD Tons per acre	% SOLUBLE SOLIDS	TOTAL YIELD OF SOLUBLE SOLIDS PER ACRE (TONS SS/AC)	TOTAL YIELD OF SOLUBLE SOLIDS PER ACRE PER GROWING DAY (TONS SS/AC/DAY)	% RIPE	% GREEN	% ROT
TSH04	97.0	47.7	4.88	2.33	0.0240	96.2	2.3	1.4
TSH28	101.0	43.1	5.08	2.19	0.0215	93.6	2.2	4.2
H5108	104.33	52.8	4.72	2.49	0.0239	95.4	1.0	3.6

HYBRID	BOSTWICK VISCOSITY (CM) (LOWER NUMBER =THICKER VISCOSITY)	% CRACKED (4' DROP TEST)	FRUIT WEIGHT (GRAMS)	% UNDER-COLOUR AFTER PEELING	PEELED COLOUR RATING 1=EXCELLENT 9=VERY POOR	PEELED FRUIT FIRMNESS RATING 1=VERY FIRM 9=VERY SOFT
TSH04	11.1	16.6	51	10.3	2.0	2.2
TSH28	11.7	23.6	62	6.5	3.0	2.0
H5108	14.3	22.4	54	4.8	3.3	3.2

Except for 1 plot each of TSH4 and H5108, all plots were planted on May 16. The earliest applications of Ethrel were on August 5 on TSH04. Harvest commenced on TSH04 on August 22, 98 days after planting. The later planting of TSH04 on May 27 was harvested only 94 days later on August 29. Later plantings take less time to mature because of warmer weather. The same pattern was observed with H5108, so the maturity comparison between these two hybrids is exact. For TSH28 which had no late planted plot, the days to harvest would be 101 days for an exact comparison to the other two hybrids.

PEELED SAMPLE PICTURES: Undercolour fruit are in the white bucket. Fruit judged acceptable for wholepack are in the blue bucket. These fruit were used to judge overall peeled colour and firmness after peeling. Fruit were peeled in 18% lye solution for 60 seconds, followed by 60 seconds retention time, and then 5 seconds on the disc bed peel removal system. **Please note that when we grade our samples, any fruit showing any red colour is counted as a ripe fruit and all of these fruit are peeled.** Most of the under colour fruit would be removed prior to peeling by automated sorting equipment in most modern commercial peeling operations. You can judge for yourself the degree of undercolour fruit by looking at the following pictures.

PEELED SAMPLES OF TSH04

MORE PEELED SAMPLES OF TSH04

PEELED SAMPLES OF TSH28

MORE PEELED SAMPLES OF TSH28

PEELED SAMPLES OF H5108

MORE PEELED SAMPLES OF H5108

RESULTS:

The visual appearance (leaf colour) of the hybrids after application of Ethrel was very similar. There has been some debate about the relative response to Ethrel of these different hybrids, but we could not see any visual differences in this trial. Total yields ranged between 43 and 53 tons per acre, with a high percentage of ripe fruit, 93-96%. The earliest hybrid was TSH04, and when adjusted for the growing days and soluble solids content was equal in yield to H5108. TSH28 was slightly lower yielding but had the highest soluble solids levels and the largest fruit size. It is likely that the yield of TSH28 would have been improved if higher plant populations (16,000 plants/acre) had been used under these conditions, as the vine size was slightly smaller than the other hybrids. Firmness of TSH04 before peeling was better than the other two hybrids according to the drop test and the amount of cracking this caused. Because TSH28 has larger heavier fruit the amount of cracking was higher than TSH04, but about the same as H5108. After peeling, H5108 appeared to have slightly softer fruit than the other two hybrids, but was still acceptable. Juice viscosity was thinner for H5108 than the other two hybrids.

CONCLUSIONS:

Maturity differences were clear cut, and should be reliable for planning planting and harvesting schedules. Acceptable commercial yields were achieved with all 3 hybrids using twin rows. Because this was not a split plot trial with single 4' rows included, the differences between our regular replicated yield trial and this one are undetermined. However, on twin rows, it appeared that smaller vined hybrids such as TSH28 would benefit from increasing the population to a higher level, possibly 16,000 plants per acre. Since the fruit weight of TSH28 is already much higher than the other two hybrids, the slight decrease in fruit size that would probably occur with a higher population would not be a significant problem. The response to higher populations would probably depend on soil fertility and moisture levels and the resulting amount of vine growth. It is very interesting that yields that match or exceed the commercial average for Ontario of approximately 40 tons per acre were achieved with all of these early hybrids. The vine size was not excessive on this very sandy location. Also, this location has had a tomato crop every other year for about 10 years. The recent use of cover crops such as pearl millet and more particularly tillage radish has resulted in excellent tomato growth. Prior to the use of these cover crops, it was difficult to achieve good tomato growth in this location.