



## *Horticulture Program*

**PROJECT:** Comparison of Disease Control on Fresh Market Tomatoes using TOMCAST and SKYBIT to Time Fungicide Applications

**FUNDS AWARDED/UTILIZED:** \$2400 / \$2200

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**BACKGROUND:** TOMCAST, a tomato disease forecasting program, has served the Ohio fresh market tomato industry since 1996 by providing assistance in scheduling fungicides. Initially, DSV spray thresholds were adapted from processing operations to meet the quality standards necessary for fresh market product. As preliminary spray thresholds continue to be developed and tested in the field, all her concerns such as access to TOMCAST information have emerged. Over the last few years, far profit weather forecasting businesses began offering local sources of Disease Severity Values (DSV) to growers. Monthly weather forecasting contracts during the growing season may have an economical appeal to growers vs. the large up front expense of a local weather station. These alternate sources of agricultural weather require investigation for both the quality and reliability of the information broadcast.

**OBJECTIVES:** (1) TO compare the accumulation of DSV in Hillsboro, OH using a ground based CR10 datalogger versus Skybit generated values and (2) To compare the fruit quality produced by both systems following a 15, and 20 DSV fungicide schedule.

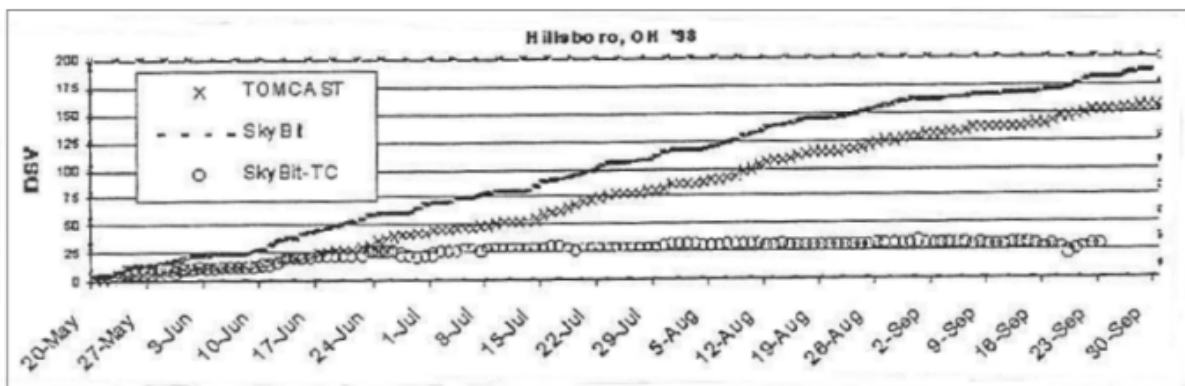
**MATERIALS AND METHODS:** A Campbell Scientific GR10 datalogger was stationed at, Hillsboro to record hourly temperature, leaf wetness, and precipitation. Specific combinations of temperature and leaf wetness are converted to DSV on a daily basis and accumulated from June 1 through harvest, typically mid September. Daily forecasted leaf wetness and temperature data were received electronically from Skybit during the same time frame, also producing a daily DSV. Fungicide scheduling trials on fresh market tomatoes were conducted in 1998 at Hillsboro, OH. There were six fungicide application treatments on tomato cultivar Mountain Spring: Skybit 15 (DSV), Skybit 20, Tomcast 15 (DSV), Tomcast 20, 7 day calendar, and an untreated check, each replicated four times. Each treatment was applied when the number of DSV accumulated by each system (Skybit or Tomcast/CR10) equaled or exceeded the Action Threshold (15, or 20 DSV), weather permitting. Fruit quality was determined on site by harvesting five feet of row per plot and analyzing the data with a two way ANOVA. Spray schedules for the site are listed in Table 1.

**RESULTS & DISCUSSION:** DSV accumulation under both systems are shown in Figure 1 for Hillsboro. The Skybit forecasting system generated a higher number of DSV than the CR10 datalogger physically measured. The maximum difference between the two curves can be seen readily by the end of June or first part of July. From this point on, the difference between the two systems remains constant or even decreases over time. Since there is no consistent pattern of accumulation, it is difficult to determine during the season when the Skybit numbers closely follow ground based observations and when they diverge. With a wide fluctuation in the accuracy of the DSV accumulations compared to ground based readings, the results were similar, especially in the area of a wide DSV gap early in the season between the two systems,

followed by unpredictable DSV accumulations later in the season. Table i. Fungicide treatment dates for Hillsboro tomato studies.

Table 1. Fungicide treatment dates for Hillsboro tomato studies. (TC = TOMCAST).

Calendar	TC 15 DSV	TC 20 DSV	Skybit 15 DSV	Skybit 20 DSV
2-Jun	2-Jun	2-Jun	2-Jun	2-Jun
22-Jun	21-Jun	21-Jun	22-Jun	22-Jun
2-Jul	2-Jul	6-Jul	2-Jul	2-Jul
9-Jul	22-Jul	22-Jul	15-Jul	22-Jul
15-Jul	3-Aug	3-Aug	22-Jul	3-Aug
22-Jul	14-Aug	14-Aug	3-Aug	14-Aug
3-Aug	28-Aug	28-Aug	14-Aug	28-Aug
14-Aug			28-Aug	
21-Aug				
28-Aug				
3-Sep				



The Hillsboro site showed no statistical separation between the treatments in the categories of Red plus Green, and Salad. Cull weight of fruit in the calendar treatment was significantly less than the cull fruit weight of Tomcast 20 DSV. Although statistically no differences were seen, the calendar fungicide program yielded the most Red plus Green fruit and the check the least. with the other treatments with very similar yields (See Table 2 below).

Table 2. Yield of Fresh Market Tomato Fruit in SKYBIT versus TOMCAST Disease Control programs.

Treatment	Fruit Wt (per 5 feet of row)		
	Red + Green	Salad	Cull
1. Untreated	16.1	4.3	2.4
2. Calendar	21.4	4.7	1.2
3. Skybit 15 DSV	19.8	2.9	3.0
4. Skybit 20 DSV	21.0	3.9	2.7
5. Tomcast 15 DSV	19.2	2.2	1.3
6. Tomcast 20 DSV	21.05	3.3	3.5
LSD 0.05%	8.42	2.96	1.96

With quality and yield being statistically no different, growers would not have been penalized for using (following) either TOMCAST or Skybit DSV accumulations to schedule their fungicides, even though the two systems accumulation curves were off by as much as 25 units at different times of the season. Part of the lack of difference may be attributed to the weather not allowing for sprays to be applied as soon as they were recommended, and the second part involves the conservative nature of the DSV calculation itself. Being "off" by a few days or a few DSV doesn't heavily affect fruit quality or yield, according to these experiments.