

Brief Recap of a 'Close Call' on Easter Weekend 2021

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At Cottle Farms in Faison, North Carolina, we experienced a cold spell in early March 2021 that could have been quite serious, but with strawberry blossoms being so much later this year, having three (3) consecutive nights days of temperatures in the mid-20s, beginning on the night of March 6th did not pose a real problem with the crop being in mostly a pre-bloom condition. In 2020, we were already picking by mid-March in this same location.

However, as our crop (finally) reached full bloom towards the end of March and early April, we were understandably concerned when we received an alert from the NC State's Strawberry Grower Information Portal on March 31st that an advective freeze event was setting up for our area for Thursday (April 1) night through Friday (April 2) morning (<https://strawberries.ces.ncsu.edu/2021/03/awis-weather-forecast-widespread-freeze/>). In addition, dewpoints were expected to fall into the 20s, and some areas would possibly experience dewpoints in the teens.

We read in the advisory that we should apply row covers on Wednesday (March 31) and leave them on until freeze conditions had passed. The advisory also mentioned the possibility of even double-covering, or perhaps using sprinkler irrigation on top of the covers. Many of the more senior strawberry plasticulture growers reading this article may recall that for the Easter Freeze of 2007 (April 7-8), it was the combination of row covers and sprinkling on the covers that helped to save much of the strawberry crop in North Carolina and Virginia (Fig. 1).



Fig. 1. Sprinkler irrigation combined with row covers can protect a strawberry crop even in windborne freeze conditions, such as the one experienced in the mid-South on April 7–8, 2007. The unseasonable warmth preceding the Easter weekend in 2007 caused the strawberry crop to bloom two weeks earlier than usual, and crop destruction in crops such as peaches and grapes was catastrophic.

For our specific situation in Faison, we did apply a 1.25 oz row cover, but we did not have at our disposal any additional covers (for doubling up). Further, we did not have the option of sprinkling on the covers because all of the irrigation ponds and sprinklers were going to be dedicated to protecting the blueberry crop (Figs. 2A-2C).



Fig. 2-A. A minimum of 29 F was reached on Saturday morning shortly before sunrise in the blueberry fields, and a similar low was recorded in our strawberry research plots. Fig. 2-B. Overhead sprinkling was utilized to protect the blueberry crop at Cottle Farms on the night of April 2-3, 2021. Fig. 2-C. Closeup of blueberry blooms encased in clear ice (all photos provided by Ron Cottle). Because of the very low dewpoints, it was VIP start sprinkling before the wet bulb reached 33 F.

Fortunately, one thing that Cottle Farms has done with success in recent years has been to run their drip irrigation system under the row cover during frost events, and though there is not a lot of written information about this procedure, I am aware of growers both in Florida and NC, who run their drip systems under radiation frost conditions to add some extra warmth, and they are satisfied it works. In our situation, Ron Cottle started the drip at 2 am, and ran it continuously through the early morning hours until after sunrise. I personally believe that running the drip helped with strawberry blossom protection we achieved on the morning of April 3rd. We have a weather station next to the strawberry research plots, and it showed a low air temperature at 6 am of 29.59 at the weather shelter height of 2 m (6.56 ft). We had two temperature sensors under the row covers, and they showed lows of 39.42 and 40.14 at the same time. Needless to say, we were very pleased that the blooms beneath the covers were in the 39-40 F range. We did not have an outside air temperature sensor at the strawberry canopy level, but with a DP in mid-20s, it is likely the air temperature near the ground that morning dropped to around 27 F. Thus, I think we may have achieved as much as 12 F protection with the 1.25 oz cover + drip heating (39 F beneath the cover – 27 F estimated air temp at the canopy level).

So, it definitely came as surprise to me when I returned to our research plots on April 9th and saw that some Ruby June blossoms, as well as green fruit, had been ‘touched by the frost’ of Easter Weekend! These injured blooms and green fruits were relatively few and far between, but it appeared that in each case these flowers and green fruits were in direct contact with the row cover above the canopy.



Fig. 3A. Frost damaged bloom of Ruby June – photo on April 9th (left photo). Fig. 3B. Some of the Ruby June ‘green fruits’ were also in touch with the row cover, and were damaged – not the discolored area on the tip of the berry. Fig. 3C. Split berry of Ruby June. Overall, the covers gave very good protection, and relatively few blooms and green fruit were damaged by this cold event.

Two interesting characteristics of Ruby June which could make it more prone to this type of frost injury are: 1) Ruby June’s very upright flowers, and 2) Ruby June, a relatively early ripening variety, also blooms a week or so earlier than Chandler and most other varieties.

As a further observation, during our harvest period from April 19 – May 25 (9 harvests), we also observed a number of ‘split’ berries in Ruby June (see Fig. 3C). In the 2020 spring harvest, we saw virtually no splits, and it was also the case that in spring 2020 we had virtually no frost issues in Faison.