

Double Crop Soybean Final Report to the Michigan Wheat Program

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Second Crop Beans- Turning on 10-16- 2013 in St. Joseph County



Double Crop Soybeans Following Wheat

- Has potential in the southern counties to add \$250-\$350 in Net Revenue to the Wheat Rotation
- Because July and August are so dry, it is usually only successful on irrigated fields
- Growers need to be prepared to harvest wheat at the earliest possible window to allow for the longest soybean growing season possible.

2013 Growing Season for Second Crop Soybeans

- Cooler than normal temperatures delayed wheat maturity by a small amount
- Wet conditions delayed wheat harvest in S.W. Michigan slightly compared to normal, creating delays in the double crop planting window.
- Subsequent dry conditions after planting, and especially in August, demonstrated the importance of irrigation in the successful production of second crop soybeans in southwest Michigan.

2013 Second Crop Soybeans

- Earliest Wheat Harvest was around July 6-7th in S.W. Michigan.
- Second Crop Beans started going in immediately after harvest
- Approximately 10 growers in S.W. Counties planted double crop beans. Their planting dates ranged from July 6 – July 20.



1st measurable snow – 10-24-2013



Our research was conducted on Larry Walton's Farm near Nottawa

- **Wheat was harvested on July 14**
- **Straw was baled on July 15- beans were planted on July 15, July 20 and July 26th.**
- **2 maturity groups were planted :**
 - **A Pioneer group 2.5 soybean was the early variety**
 - **An Asgrow group 2.9 soybean was the late variety**
- **Beans were no-tilled into wheat stubble**
- **Irrigation was applied at regular intervals to help growth and development during the growing season.**

Frost – 10-24-2013 – taken 10-28-2013



Results:

Soybean plants were collected from each treatment in early December. Early winter weather delayed yield evaluation, plus we were interested in giving the plants as much time as possible to allow for mature coloration of the soybean seed. Yields were estimated using two different procedures:

Plants per acre x pods per plant x seeds per pod * seeds per pound

and

Plants per acre x weight of seeds extracted per plant sample converted to bushels per acre at 13% moisture.

The two different methods of yield estimation were in reasonably close agreement and the yield results for the two varieties from the July 15 planting date are shown in the table below:

	Pod Count Method	Seed Weight Method
Asgrow 2903 Soybeans	34.5 bu/acre A	30.5 bu/acre
Pioneer 2501 Soybeans	30.5 bu/acre B	29.9 bu/acre
	LSD 0.05 = 2.3	N.S.

	Seeds per Pod	
Asgrow 2903 Soybeans	2.45	A
Pioneer 2501 Soybeans	2.13	B
	LSD 0.05 = 0.14	

Harvest plants per row foot were approximately 7.5 plants per row foot (130,500) for both varieties. Planted population was 9-10 seeds per row foot calibrated several times with adjustment for seed size.

Yields on the July 20th planting are a little harder to estimate. By weight, the plots ranged from 13 to 22 bushels per acre. The challenge came from the fact that the soybeans in the upper pods failed to gain the rounded shape and full yellow coloration that we expect to see in mature soybeans. Subsequent recheck of yields showed similar results in the spring.

The July 26th planting date soybeans, while loaded with pods, would definitely not have been machine harvestable because the seeds never gained enough size before harvest, were loaded with green pumpkins and the only mature (larger seeds) were very low to the ground.

Double Crop Soybean Budget (For the July 15th Planting Date)

Median Yield: 30 bu/acre

Harvest Price: \$12.00

Gross Revenue: \$360.00

Seed Cost*: \$55.00

Herbicide: \$20.00

Irrigation: 6@ \$2.50 \$15.00

Harvest/Fuel: \$15.00

Trucking: \$ 5.00

Cost: \$110.00

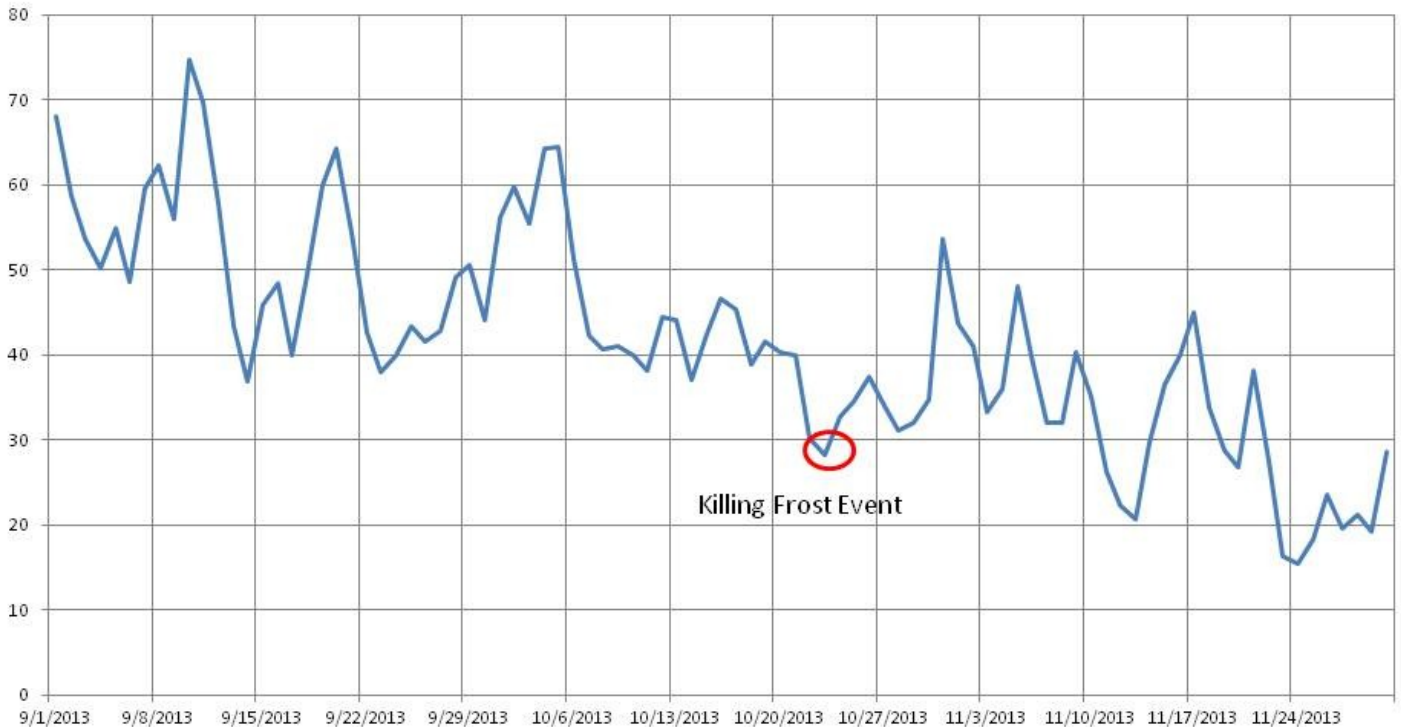
Net Revenue: **\$250.00**

Discussion:

Double cropping soybeans following wheat is a risky proposition. Success of the crop often depends upon how early the wheat crop can be harvested, the relative warmth of July, August, September and early October, and the date of the first killing frost. This year, at our research site, wheat harvest was delayed slightly by early spring cold temperatures and rainfall prior to harvest. The beans were no-till seeded into the wheat stubble immediately following straw removal. Irrigation water was added as soon as the planting was completed. Total irrigation applied was around 3.6 inches for the season. The plants were not subjected to drought stress throughout the trial. A killing frost was received on 10-24-2013, 69 days after the first beans were planted. Looking at the percentage of times that we get a killing frost by date in Southwestern Michigan, we find that we have a 10% by September 27th; 30% chance by October 7th ; 50% chance by October 15th, 70% chance by October 21st; 90% chance by November 1st. Areas closer to Lake Michigan, are less likely to have an early killing frost date, but may have challenges with more cloud cover beginning in early September and may have fewer growing degree day heat units accumulate over the summer compared to south central Michigan.

In order to estimate the risk of producing second crop soybeans following wheat in southwest Michigan, we evaluated the actual date of the first killing frost for central St. Joseph County (MI) using the MSU Enviro-weather station data that was located nearest to our plot site., which is the Mendon MAWN station. This station was established in 2004. Over the 10 year period it has been in operation, 5 of the years, growers would have been able to raise second crop soybeans easily if they were planted by July 10. During another 3 years, growers would have had a significant scare of a season ending killing frost (temperatures in the lower 30's), but the actual killing frost did not occur until between October 18th and 24th. And finally, during 2 years (2004 and 2006), we would have lost the crop because early frost would have killed the soybeans before they matured. The fall daily minimum temperatures have been included at the end of this report so that you can see how close to freezing we get in late September and early October.

Mendon Daily Low Temperatures Fall 2013



The harvest window for double crop soybeans was very short this season. Wet conditions in the fall led to early snowy conditions that persisted from late November until the end of March. Growers that raised double crop soybeans this year report yields from the mid 40 bu/acre range to simply not being able to get a harvest window until late spring. The difference in planting dates between the first and the last was not more than 12 days.

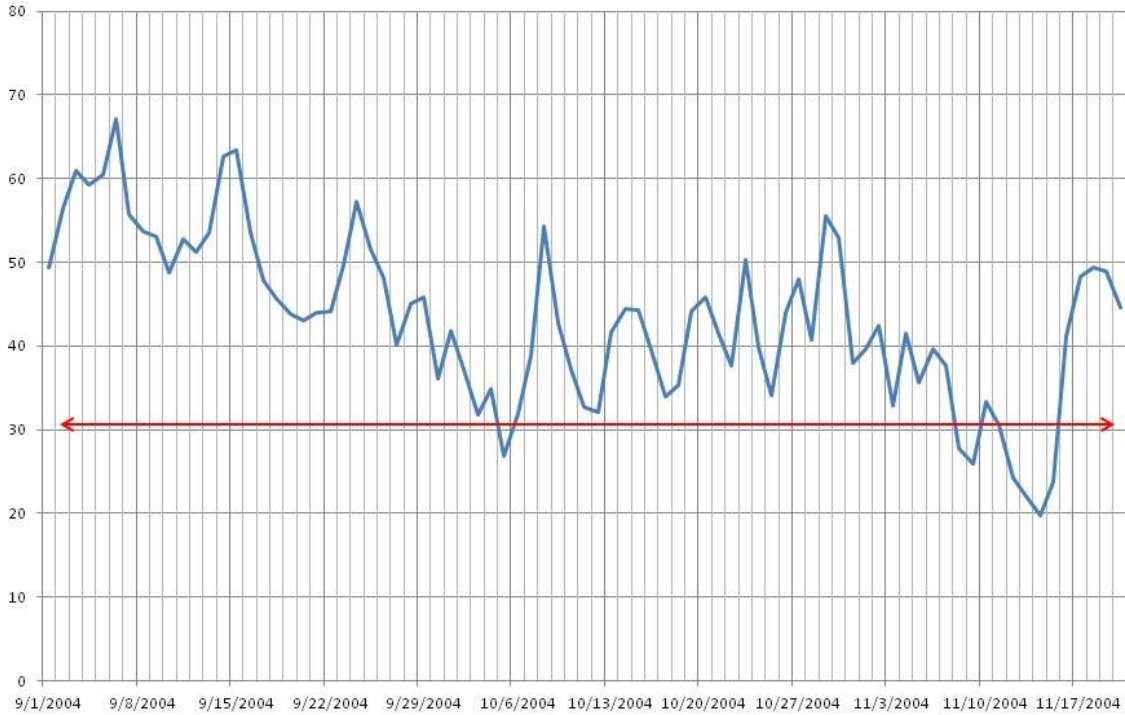
Although the yields did not show a sizable difference between the maturity groups we tested (2.9 vs 2.5), there may be an advantage for planting the shorter maturity soybeans. Soybean seed size tended to be larger, even if the number of beans per pod was significantly lower. Also the number of greenish soybeans was lower for the group 2.5 beans compared to the longer maturity variety. In a March 6, 2014 meeting, Purdue Soybean Specialist Dr. Shaun Casteel reported a similar finding in his research that showed an advantage to planting shorter maturity soybeans up to an entire group than is normally planted in the area.

Another thing to consider is that soybean seed that has been treated with insecticides and fungicides often are harder for the companies to store over the winter. Many growers report that prices on treated seed may be substantially lower during the double crop planting window. We used the seed cost from MSU's Crop Budget, and the budget included in this above does not reflect potential lower costs for planting late season treated seed. Growers need to keep in mind that soybean seed gets shipped back to the plants for storage in June, so plan ahead and visit with seed suppliers.

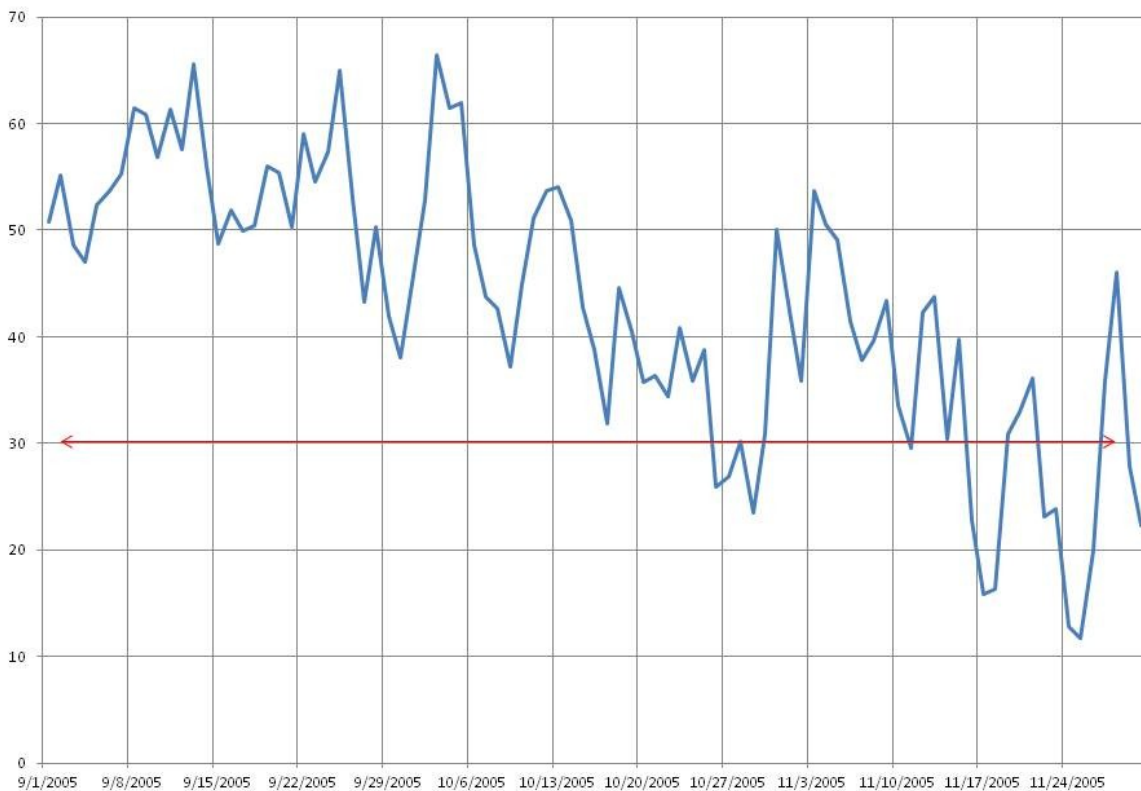
Planting second crop soybeans following irrigated wheat production in southern Michigan continues to be a risky proposition. However, the financial rewards can be significant if growers can get wheat harvested early enough to allow the soybeans to mature. Our analysis showed that the crop could have been successfully raised 70-80% of the time based on the weather in south central St. Joseph County over the last 10 years.

Daily Low Temperatures during September, October and November between 2004 and 2012 at the MSU Enviroweather Station located near Mendon Michigan

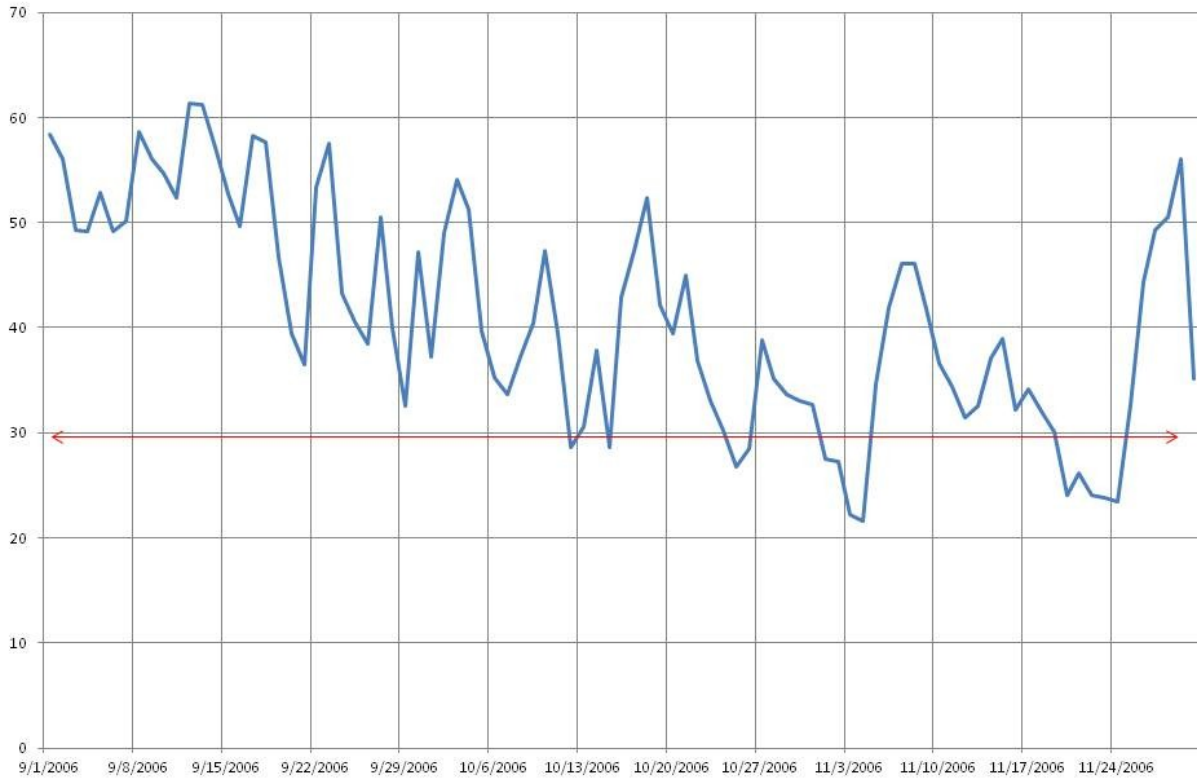
Daily Low Temperatures Fall 2004



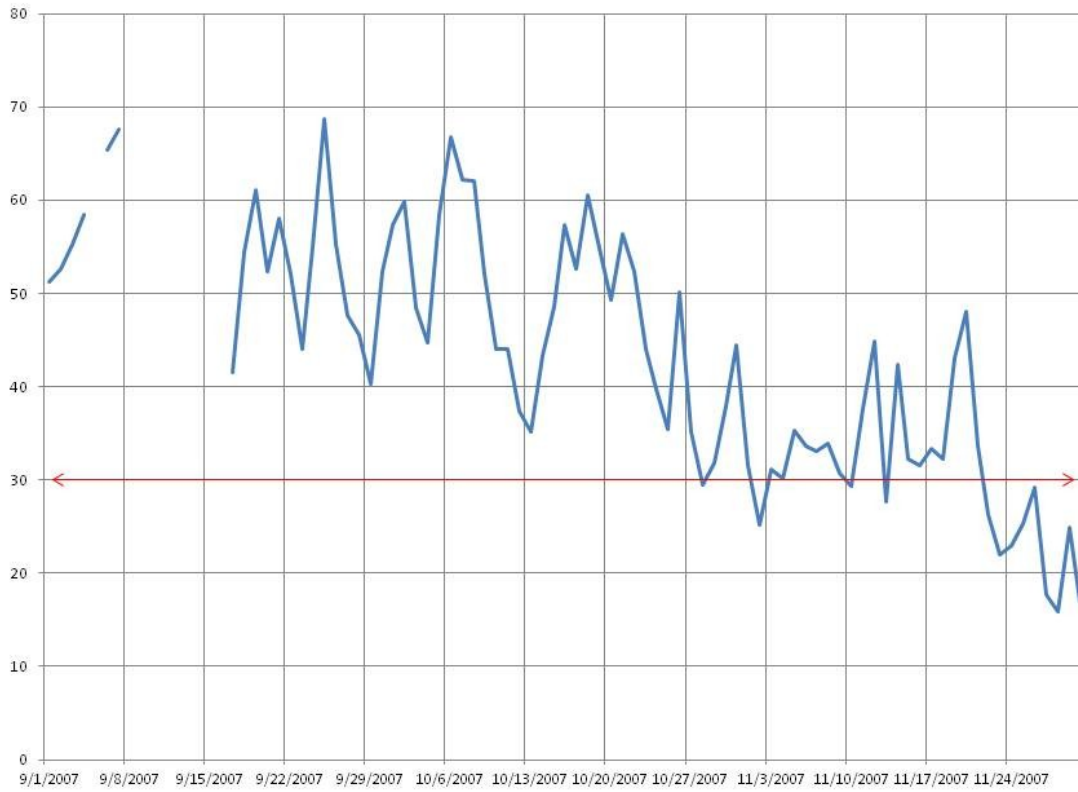
Daily Low Temperature Fall 2005



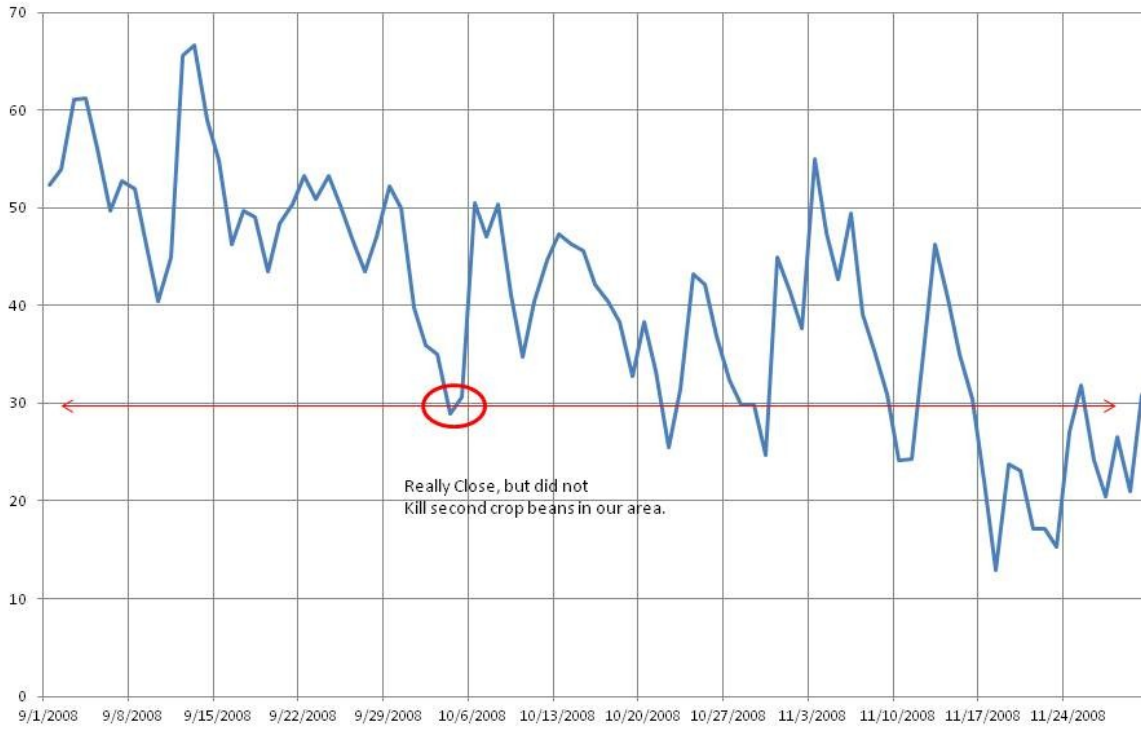
Daily Low Temps Fall 2006



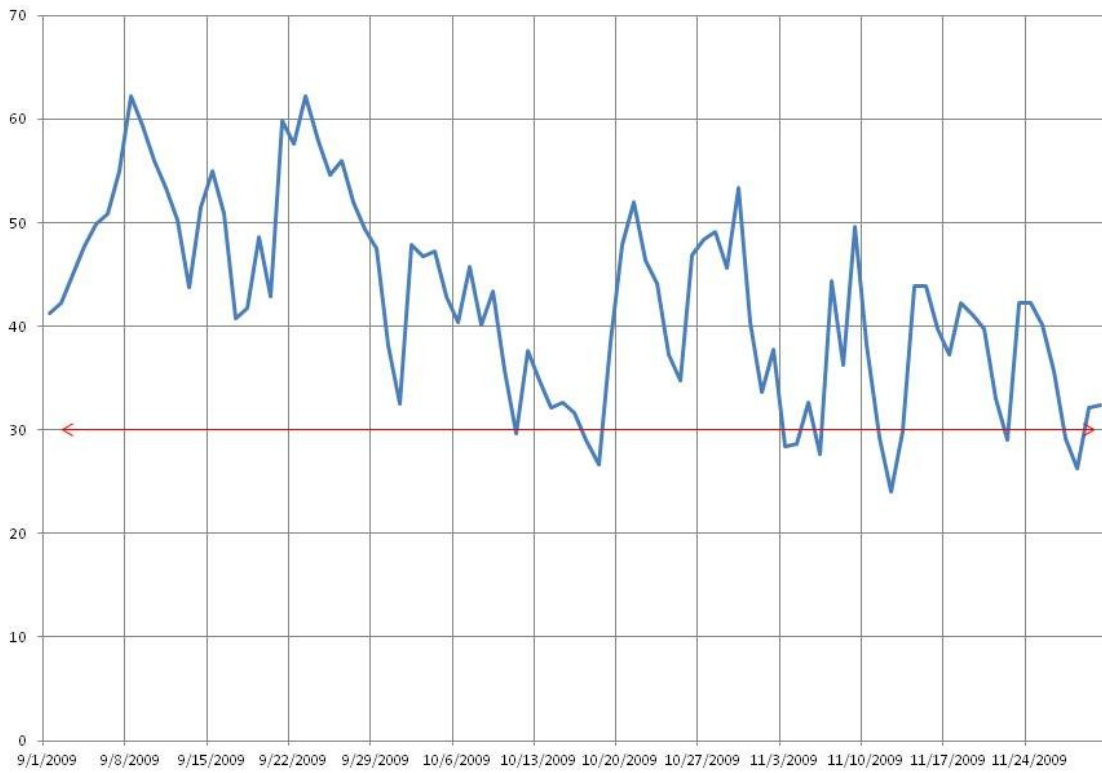
Daily Low Temps Fall 2007



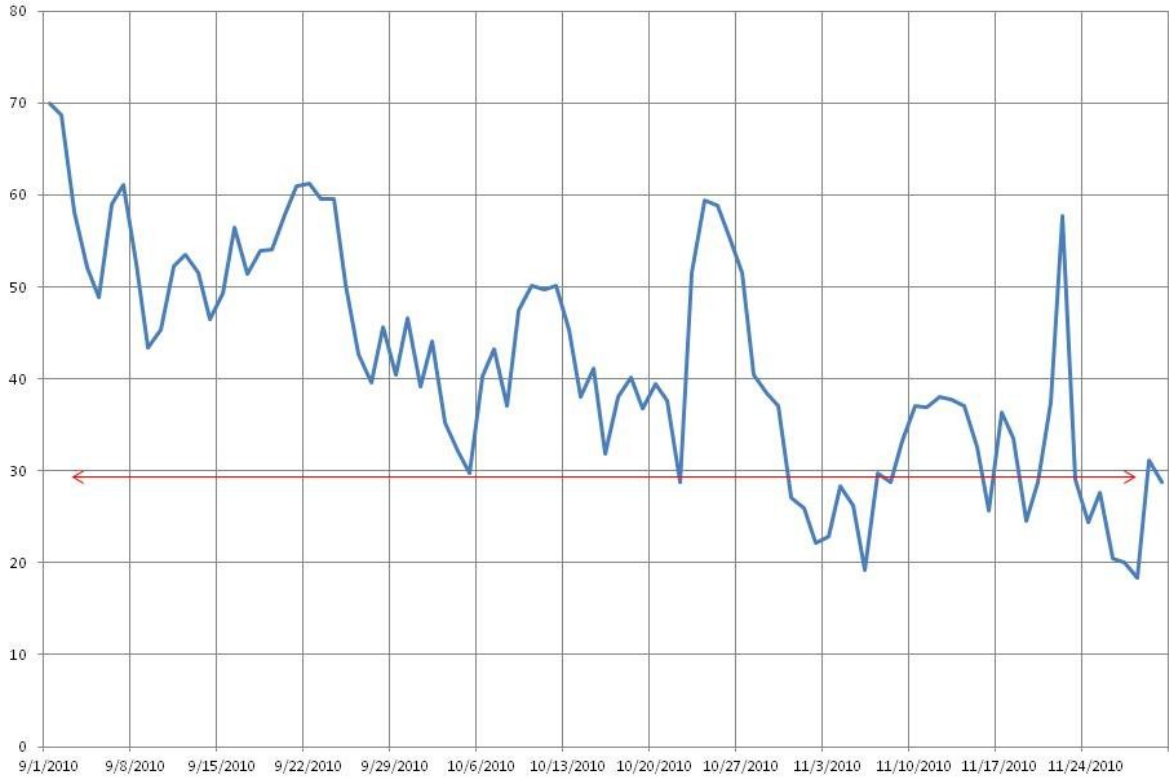
Daily Low Temps Fall 2008



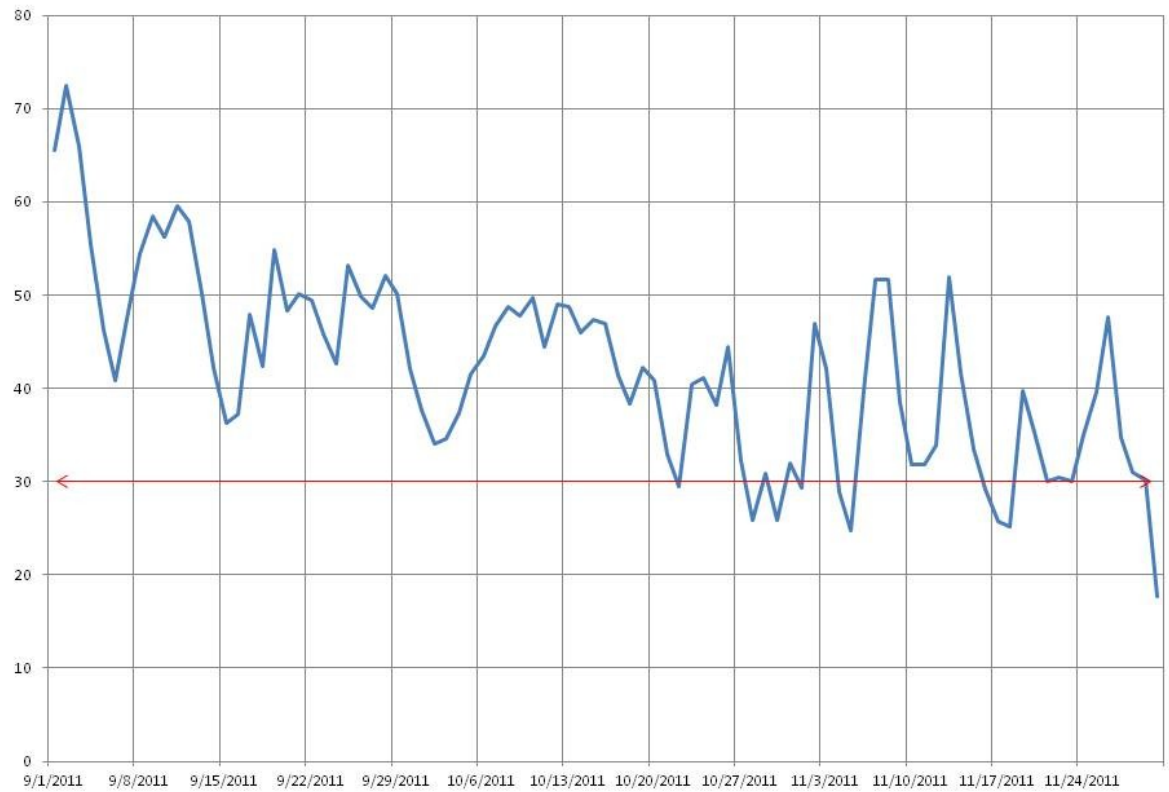
Daily Low Temperature Fall 2009



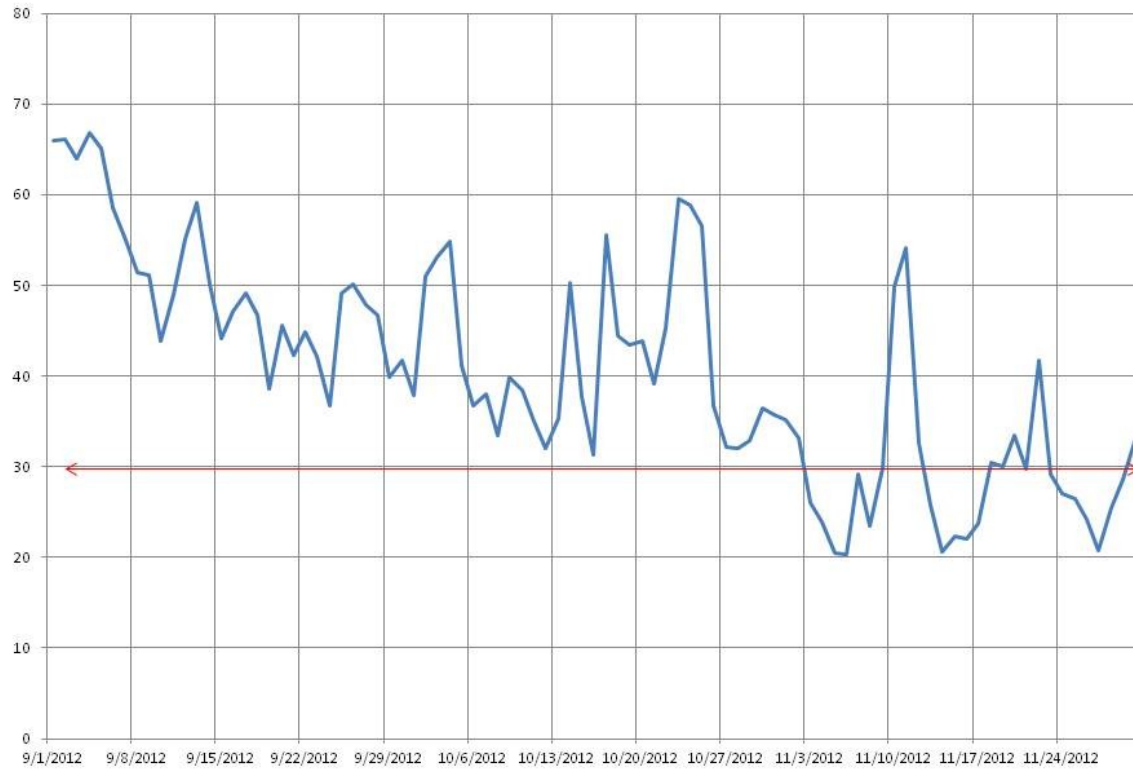
Daily Low Temperatures Fall 2010



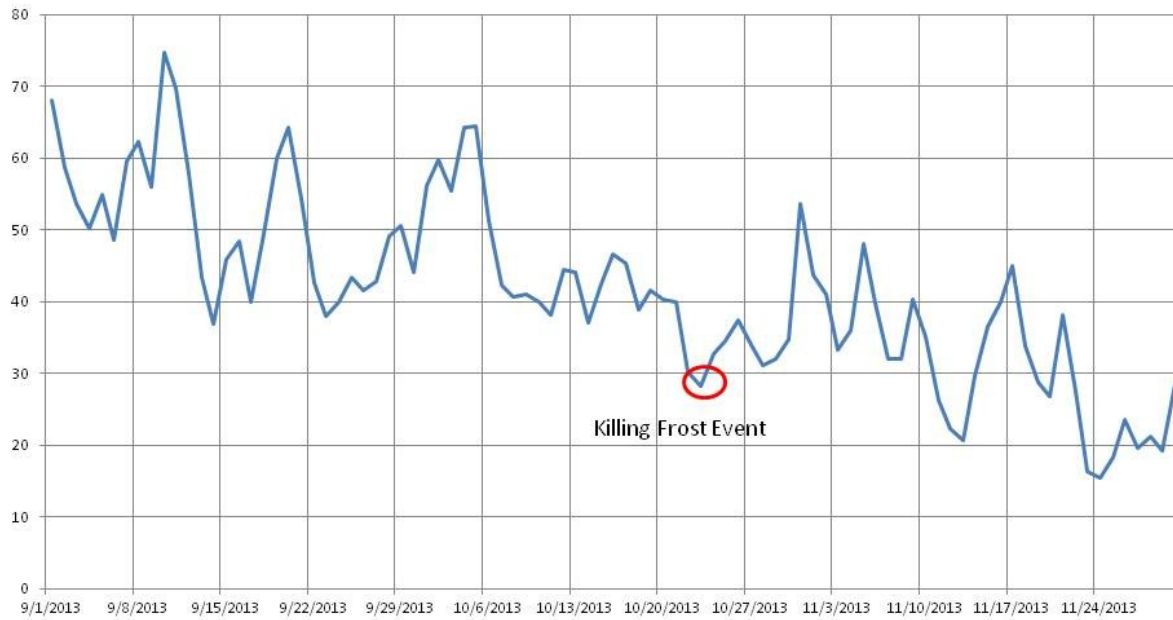
Daily Low Temperatures Fall 2011



Daily Low Temps Fall 2012



Mendon Daily Low Temperatures Fall 2013



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