brownsh@ufl.edu
(239) 533-7513

The Assumed Effects of Cold Weather on the Flowering of five Ornamental Trees in Southwest Florida

Stephen H. Brown
Lee County Extension, Fort Myers, Florida

Key Words. Phenology, climate change, flowering trees

For several years, I have been documenting the advent, climax, and decent of the blooms of several species of flowering trees in Southwest Florida. The contrast between the winter of 2008-2009 and 2009-2010 gave me the opportunity to compare the effect of temperatures on the blooms of these trees. For this publication, I have chosen five such species for seasonal comparisons. There is one new term that must be understood. Intense Blooming Days (IBD) are the sum of the days when the opened flowers on a tree are 50% or more of its maximum flowering potential. The IBD is determined on the ground in full view of the tree.

The trees used to determined IBD were all located in the city of Fort Myers. These neighborhood trees were front yard assessable. IBD observations were made without control of environmental variables (cloud cover, rainfall, irrigation, fertilizer applications, temperatures, etc.). In previous years, the IBD start days of a particular species often had only one, two or three days difference. Thus, for the purpose of this report, if the IBD start dates and durations between the winters of 2008-2009 and 2009-2010 are significantly different it is assumed that these differences were due to differences in low temperatures.

The five species included in this report are *Cassia fistula* (golden shower), *Delonix regia* (royal poinciana), *Jacaranda mimosifolia* (jacaranda), *Plumeria rubra* (frangipani), and *Tabebuia aurea* (yellow Tabebuia).

A number of trees in the five species were observed in 2009 and again in 2010. The average start dates and durations of IBD are reported in this publication.

Temperatures

Temperatures below 50°F are considered 'chilling temperatures' that cumulatively affects the ability of many temperate fruit trees to flower and bear fruits. The more chilling hours the better the bloom and greater the yield. However, for tropical flowering trees, the opposite response is expected.

Fort Myers is located in USDA climatic zone 10A. That means the lowest average winter temperature is 30°F. However, the coldest days in Fort Myers only infrequently dip to 30°F or lower as these are rarely the average lows over an extended period.

In the winter of 2008-2009 there were 28 days with temperatures at or below 50°F. In the winter of 2009-2010 that number increased by 60 % to 47 days.

Table 1. Numbers of days in Fort Myers, Florida, with winter temperatures at or below 50°F, 40°F and 35°F.

Winter	Days ≤ 50°F	Days ≤ 40°F	Days ≤ 30°F
Historical Average	0	0	0
2008-2009	28	5	1
2009-2010	47	9	4

IBD Advents and Durations

Six golden showers, 10 royal poincianas, 12 jacarandas, 10 plumerias and 7 yellow tabebuias were assessed in the winters of 2008-2009 and 2009-2010. In all cases, IBD were delayed assumably by the cooler weather of 2009-2010. Royal Poinciana had the greatest setback, 22 days; followed by Plumeria, 13 days; Jacaranda, 8 days; yellow Tabebuia, 3 days and golden shower, 2 days.

The durations of IBD from the winter of 2008-2009 to 2009-2010 were reduced in all cases. For the golden shower, the duration of IBD were reduced from 25 to 23 days or 8% less days of intense flowering. For the royal poinciana those days went from 55 to 33 or a 40% decline. Jacaranda had 22% less IBD and the start of those days was delayed by 8 days. The length of the IBD for Plumeria went from 106 to 93 days or a 12% decline. For yellow Tabebuia there was a two day delay in the start of IBD and a 19% decline in the length of IBD.

Table 2. Start and duration of Intense Blooming Days for *Cassia fistula* for the winters of 2008-2009 and 2009-2010.

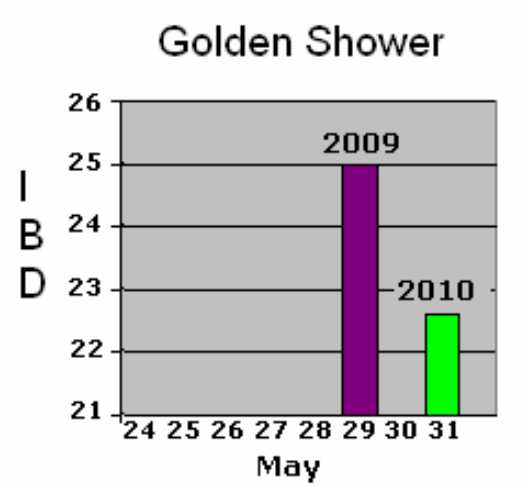


Table 3. Start and duration of Intense Blooming Days for *Delonix regia* for the winters of 2008-2009 and 2009-2010.

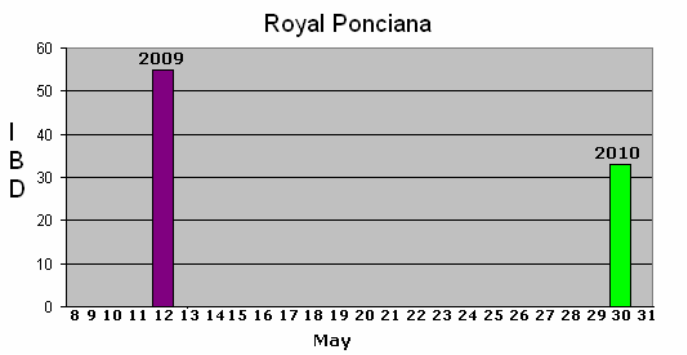


Table 4. Start and duration of Intense Blooming Days for *Jacaranda mimosifolia* for the winters of 2008-2009 and 2009-2010.

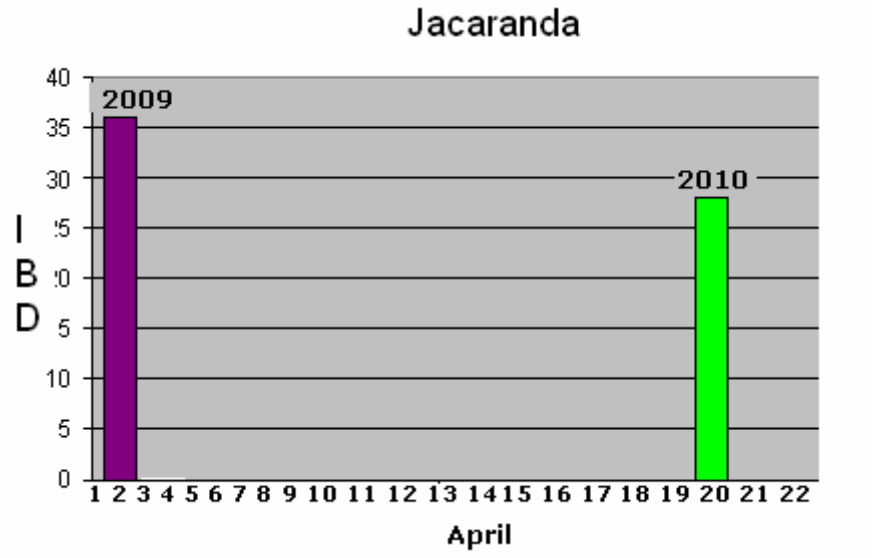


Table 5. Start and duration of Intense Blooming Days for *Plumeria rubra* for the winters of 2008-2009 and 2009-2010.

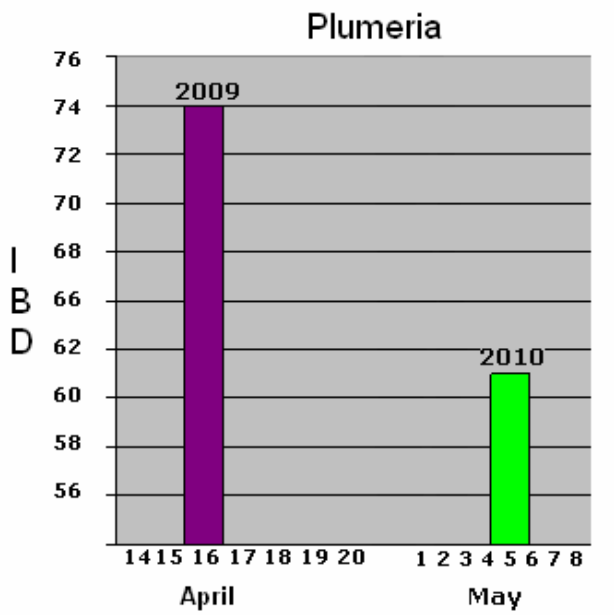
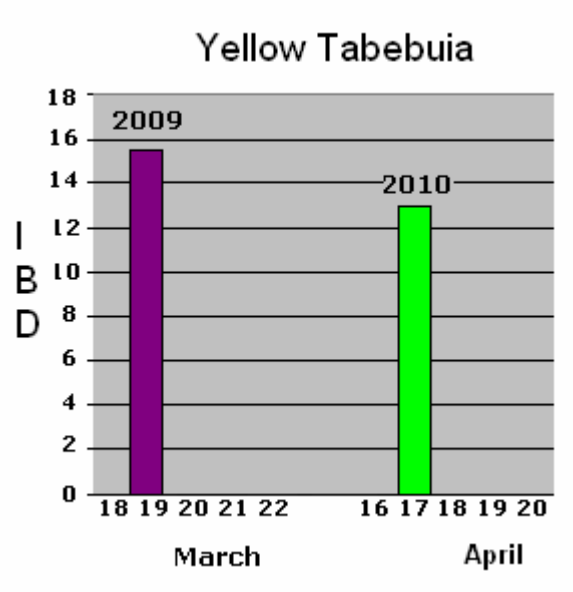


Table 6. Start and duration of Intense Blooming Days for *Tabebuia aurea* for the winters of 2008-2009 and 2009-2010.



Conclusions

These conclusions are based on my discernment rather than the scientific method.

- Trees remain quiescent until suitable temperatures for growth are experienced.
- The start of flowering of the most commonly grown tropical flowering trees are controlled by temperature.
- The start of IBD of many tropical flowering trees is affected by the number of days at or below 50°F.
- The duration of IBD is affected by the numbers of days at or below 50°F.
- A significant change in climate is expected to alter the flowering start dates, IBD dates, and duration of IBD for many ornamental flowering trees in the subtropics.