TIMING REST BREAKING SPRAYS FOR CHERRY

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In recent years there has been much experimentation by researchers, growers, and PCAs in using rest breaking sprays to compact and advance bloom and harvest in sweet cherry. Dormex and CAN 17 are the two most commonly used materials. The effectiveness of these materials can be quite variable depending on rate, timing, weather, orchard conditions, adjuvants and perhaps variety. Under favorable conditions they can advance bloom by 10-14 days and harvest by 7-10 days. Under poor conditions they may have minimal effect on advancing bloom and may reduce fruit set and/or kill buds or branches. This is a summary of what we know to date.

Dormex (hydrogen cyanamide) can be effective when applied at 1-4% (volume/volume) spray solution. The 1-2% rate with 0.5-1.0% Entry is commonly used. It should not be applied within 7 days of an oil spray due to potential phytotoxicity. It needs to be applied after a certain amount of chill has occurred but not within a month of bloom. Earlier work used the number of chill hours below 45^{o}F to time applications. Sprays that went on at about 550-600 chill hours gave better but still quite variable results. In more recent years, Chill portions calculated fron the Dynamic Chill Model have proved to give a better estimate of true bud maturity and tree response to these materials. Applications made between **45 to 55 Chill Portions** have been able to consistently advance bloom by 10-14 days and harvest by 7-10 days. This has been true in both Stockton and Brentwood locations.

However, in Brentwood, we have also seen a significant reduction in fruit set in some locations even with optimum Chill Portion timing. In 2005, we also saw a considerable amount of bud and limb death with later (after 54 Chill Portions) Dormex applications in both Stockton and Brentwood. This may have been related to cold temperatures and/or high humidity during the application period.

So Dormex is the most powerful rest breaking agent but also runs a greater risk of phytotoxicity and is still a bit unpredictable. It is also quite an expensive application (about $200/A) which requires a restricted materials permit and a closed cab application.

CAN 17 (calcium ammonium nitrate) + surfactant. Tank mixes of 5-45% (v/v) CAN17 and 0.5-4% surfactant have also been effective at advancing bloom and harvest. Applications of 10-12% CAN17 and 0.5-1.0% Entry are commonly used. The treatments can go on a bit later than Dormex but should not be applied within 3 weeks of bud break as there is a risk of phytotoxicity. Sprays applied after 650-750 chill hours below 45^{o}F have accumulated have been most promising but results have been pretty variable. The Chill Portions method has been a much better estimate of bloom response. Applications made between **48 to 58 Chill Portions** have consistently advanced bloom by5-7 days and harvest by 3-5 days.

So although CAN 17 is not quite as powerful a rest breaking agent as Dormex, it seems to be safer and more predictable. We have not seen fruit set reductions with this material. It does not require a special permit or application equipment and it only costs about $25/A.

Spray oils can also serve to compact the bloom period although they are less effective than these other materials. They are probably most effective after at least 50 Chill Portions have accumulated but there is less data to support exact timing suggestions. A 3% narrow range oil or 3-5% emulsion are safe and effective rates. So the oil used in a delayed dormant Cherry Leafhopper spray may also help to compact a prolonged bloom due to low chill!

Orchard Conditions will influence how well all these rest breaking agents work and how likely they are to cause damage to your trees. The **temperatures** 2-3 days after application are critical. Low temperatures (close to freezing) will negate effectiveness. Moderately high temperatures (65-70 ^{o}F) will enhance effectiveness. Even higher temperatures can give good rest breaking results but will also increase the risk of phytotoxicity. So look at the weather forecast before spraying and adjust the rates accordingly to minimize the likelihood of damage.

Young trees and **stressed trees** (such as drought) are more likely to experience phytotoxicity. Using a higher spray volume (125-150 GPA) may reduce the risk.

Chill Portions from the Brentwood CIMIS station are summarized below and now available from the Weather Services section of the Fruit & Nut Research and Information Center:
http://fruitsandnuts.ucdavis.edu/chillcalc/index2.htm

BRENTWOOD CHILL ACCUMULATION				
	2004-2005		2005-2006	
Month	Chill Hours	Chill Portions	Chill Hours	Chill Portions
Oct	NA	6	NA	0
Nov	127	24	87	7
Dec	420	47	287	23
Jan	809	72	439	47
Feb	887	87	622	62
	2006-2007		2007-2008	
Month	Chill Hours	Chill Portions	Chill Hours	Chill Portions
Oct	NA	0	NA	2
Nov	90	15	92	11
Dec	440	35	401	34
Jan	824	56	751	60
Feb	951	74	918	79