

Implementation of Precision Chemical Thinning in NY

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Several NY fruit growers and consultants attended a precision chemical thinning workshop on May 1, 2013, at the Agricultural Research Station in Geneva and agreed to participate in an improved method of conducting chemical thinning this year called “*Precision Chemical Thinning*”. The new method utilizes both the carbohydrate model and the fruit growth model to apply a series of chemical thinning sprays to achieve a predetermined number of fruit per tree. The 2013 method uses the carbon balance model as a tool for predicting response prior to application of thinners and the fruit growth rate model for early assessment of thinning response immediately following application of thinners.

A short summary of the method is (1) select a mature orchard of either Gala or Honeycrisp, (2) count flowering clusters on 5 representative trees at pink, (3) calculate the desired number of fruit per tree based on the number of trees per acre and the yield and fruit size you expect, (4) tag 15 representative spurs per tree on each of 5 representative trees (75 total spurs) at pink or during bloom, (5) choose one of two spray protocols of thinning sprays (see below Tables 1 and 2), (6) use the carbohydrate model to adjust rates up or down based on model recommendation (model is now online at the NEWA website <http://newa.cornell.edu>), (7) measure fruit diameters on 75 spurs 6 times (3 and 8 days after petal fall spray, 3 and 8 days after 12mm spray, and 3 and 8 days after 18mm spray), (8) send the data within 24 hours after each 8 day measurement to Terence Robinson (tlr1@cornell.edu) and Mario Miranda Sazo (mrm67@cornell.edu), and (9) get back an assessment within 24 hours of thinning progress before next spray.

Table 1. Two options in 2013 for Precision Thinning of Gala

Option 1 (more aggressive and recommended for the good bloom expected for this year)	Option 2 (less aggressive)
Apply a Bloom Spray (Maxcel 96oz/acre)	Apply a Petal Fall Spray @6mm (NAA 6oz/acre + Sevin 2pt/acre)
Apply a Petal Fall Spray @6mm (NAA 6oz/acre + Sevin 2pt/acre)	Apply a 12mm Spray (Maxcel 96oz/acre + Sevin 2pt/acre)
Apply a 12mm Spray (Maxcel 96oz/acre + Sevin 2pt/acre)	Apply a 18mm Spray (Maxcel 96oz/acre + Sevin 2pt/acre + Oil 1pt/acre directed to the upper part of the tree)
Apply a 18mm Spray (Maxcel 96oz/acre + Sevin 2pt/acre + Oil 1pt/acre directed to the upper part of the tree)	

Table 2. Two options in 2013 for Precision Thinning of Honeycrisp

Option 1 (more aggressive and recommended for the good bloom expected for this year)	Option 2 (less aggressive)
Apply a Bloom Spray (Maxcel 48oz/acre)	Apply a Petal Fall Spray @6mm (NAA 8oz/acre + Sevin 2pt/acre)
Apply a Petal Fall Spray @6mm (NAA 8oz/acre + Sevin 2pt/acre)	Apply a 12mm Spray (NAA 6oz/acre + Sevin 2pt/acre)
Apply a 12mm Spray (NAA 6oz/acre + Sevin 2pt/acre)	Apply a 18mm Spray (Sevin 2pt/acre + Oil 1pt/100gallon, directed to the upper part of the tree)
Apply a 18mm Spray (Sevin 2pt/acre + Oil 1pt/100gallon, directed to the upper part of the tree)	

With whichever option chosen, you will use a stepwise thinning program of spraying and then assessing the effect before deciding on the need for the next spray. Before each spray, you will run the carbohydrate model to determine the specific thinner rate for your orchard (start with the base rate listed above in the option you chose and then adjust up or down depending on the output recommendation from the carbohydrate model). After spraying you will determine the effect of the thinning spray by using the fruit growth rate model which entails measuring the diameter of each fruit in 75 clusters on day 3 after spraying and day 8 after spraying and using a spreadsheet to calculate the thinning effect of the spray (There is a very precise methodology for these measurements and you must have some training to do this portion of precision thinning). With these results you then decide on the need for the next spray in the protocol and repeat the cycle if another spray is needed. In some cases only the first and second sprays in the protocol will be needed but in other cases 3 or even 4 sprays from the protocol will be needed to achieve the target fruit number.

An Update on Fruit Measurement Studies by May 31st 2013

Growers should use slightly reduced rates (15-30%) for the next few days. If it really gets to the 90's then growers should delay thinning until temperatures moderate.

The results of fruit diameter measurements made by several cooperating NY grower and consultants after petal fall thinning sprays around May 19th or 20th show that the sprays provided significant thinning on Gala and Honeycrisp but that additional thinning is still needed. In these blocks where fruit size was measured on day 3 and day 8 after the thinning spray, Gala and Honeycrisp fruit set on mature trees was reduced by about 70%, however the target is to reduce fruit set by 90%. Thus substantial thinning on Gala and Honeycrisp still remains to be done. This suggests another spray in these blocks. These results suggest what might be done in

similar blocks with excellent bloom and set. Of course, you know best conditions on your farm and how individual blocks respond to thinners.

The high temperatures which are forecasted are creating a moderate carbohydrate deficit which suggests reduced rates depending on how high the temperatures go. If temperatures reach 90°+ then we suggest delaying thinning sprays until temperatures moderate. Since the weather forecasts change regularly and that affects the apple carbohydrate thinning model, we suggest that growers check the model each day but especially immediately before spraying to get the best estimates of thinning effect. If the forecasted conditions aren't achieved then the thinning prediction will be wrong. This is one of the risks of having a model using forecasted data and then having growers not check it regularly.

The carbohydrate model is now available on the web at the NEWA website (<http://newa.cornell.edu>) under the crop management tab. Run the model before each thinning spray and adjust thinner rate based on the recommendation in the last column of the page. The four very simple steps are: (1) Go to the NEWA Apple Carbohydrate Thinning Model Page, (2) Choose a station and click “Continue”, (3) Enter your green tip (@ April 16-17) and full bloom dates (@ May 7-8) and click “Calculate”, (4) Move the scroll bar on the right to find today’s date on the table. The last column gives the recommended adjustment in thinning rates for today based on the model. The model is limited by the accuracy of the forecasted temperatures and sunshine, which change daily.

Note: This information was provided to growers via a biweekly publication called “Fruit Fax” produced by the Lake Ontario Fruit Program, Cornell Cooperative Extension. The presentation will include the results of 8 field studies conducted as part of a precision chemical thinning group effort during May 2013 in NY State.