# Branching Young Apple Trees with Plant Growth Regulators

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**Applications where PGR's can be used to increase branching on apple.**

1. **First-leaf apple trees where the leader with no buds broken but just prior to bud swell. For example, newly planted nursery tree "whips."**
   A) If dormant buds are present on one-year-old wood: Apply a high rate (5,000 ppm) of MaxCel® or Promalin® mixed in latex paint BEFORE buds break. See product labels for more details and instructions.

   B) If buds have broken, and the leaf tissue is showing on one-year-old wood: Mix 400 PPM MaxCel with water, NO SURFACTANT, or 400 PPM Promalin plus a non-ionic surfactant

Two-year-old Ruby Mac/M.9 Pajam 2 trees at UMass Cold Spring Orchard, Belchertown, MA as part of a branching trial conducted by Jon Clements. Untreated (left) and MaxCel treatment (right), one year after application. Treatment (MaxCel at 400 ppm) was applied in early July 2016, with a backpack sprayer. This was considered a late application; spur leaves were almost fully leafed out and starting to form a fruit bud. MaxCel treatment for branching is recommended once the buds break and green leaf tissue is visible.

Notching blindwood in the spring before significant bud growth.

Two-year-old non-bearing Granny Smith trees with no visible buds (blind wood). Trees were notched with a hacksaw blade (narrow, fine-toothed saw, usually used for cutting metal) just above the existing bud scar on the leader, and then the cut was sprayed immediately with a 1500 PPM solution of MaxCel. Photos courtesy of Dr. Steve McCartney, Valent BioSciences.

(NIS). Apply by spraying with a back-pack sprayer. Works best when temperatures are warm and there is enough tissue to absorb the PGR. Note: Never add surfactant to a solution of MaxCel as it is already included in the formulated product. Promalin should be combined with a NIS following the label instructions.

2. **Second-leaf apple trees where leaders have "blind wood" with no visible buds or branches.**

   A) Make a notch with a hacksaw blade (narrow, fine-toothed saw, usually used for cutting metal) just above the existing bud scar on the leader then on nonbearing trees, immediately spray the cut with a 1500 PPM solution of MaxCel.

3. **Existing young tall-spindle or vertical-axis apple orchards with limited branching in the tops of the trees: an airblast sprayer application should be considered.**

   A) If spraying non-bearing trees in second or third leaf, to increase overall branching, apply Max-Cel at 200-300 PPM using an airblast sprayer. It is best if lower nozzles are turned off and the spray is targeted to the top 1/3 to 2/3 of the tree where more branching is desired.

Second-leaf Cortland trees at the end of the season after receiving MaxCel at 200 ppm with an air-blast sprayer during bloom. Apex Orchards, Shelburne, Massachusetts.

Second-leaf Macoun trees at the end of the season after receiving MaxCel at 200 ppm with an air-blast sprayer during bloom. Apex Orchards, Shelburne, Massachusetts.

B) If spraying bearing trees in second or third leaf to increase overall branching, apply MaxCel at 200 PPM using an air-blast sprayer. It is best if lower nozzles are turned off and the spray is targeted to the top 1/3 to 2/3 of the tree where more branching is desired. Time the application to apply at bloom to petal fall to cover green tissue. This rate will help remove fruit in the top 1/3 of tree, where you do not want to allow the canopy to fill out.

**4. Nursery Trees**

A) Apples in a nursery or planted in place can be

Applying MaxCel/Promalin for branching to apple trees at Adams County Nursery, Ellendale, DE USA.

branched with applications of MaxCel or Promalin at 400 PPM (400 mg. $L^{-1}$) when leader growth reaches approximately 70 cm. or 28 inches above ground. i.e., the height at which the start of branching is desired. This treatment should be repeated at 7-14 day intervals or every 5-6" of leader growth for a total of 4 -5 applications. This rate of terminal growth on the leader will depend on temperature.

On the first application date, the central leader shoot tips should be 28 inches above ground. We suggest applying PGR'S to tree leaders with a backpack sprayer. Use a single nozzle (cone jet hollow cone spray tip), calibrated to apply 4 ml of solution per application, and directed over the tip of the leader of each tree. Any hand

TeeJet ConeJet Nozzle, pressure regulator, swivel head applying 4ML of PGR solution to apple growing tip.

Feathers starting in treated Trees at Adams County Nursery, Delaware. Trees are Macoun/M.9 NAKBT337 and received four applications of Promalin at 500 ppm to the growing tips every 7-10 days.

Feathers on Macoun/M.9 NAKBT337 trees with four applications of Promalin at 500 ppm to the growing tips. Adams County Nurser, Delaware.

pump manually operated back pack sprayer can be used but should have the boom modified to have a pressure regulator, and a swivel head attachment for the nozzle head (See Photo) so that the desired amount of spray can be applied to each tree. Parts are available from TeeJet Corporation and Gate Technologies. **Note:** A complete parts list and instructions can be obtained from the author: Win Cowgill, P.O. Box 143, Baptistown, NJ 08803 USA (wincowgill@mac.com).

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**Literature Cited**

Terence Robinson, Brent Black, and Win Cowgill. 2014. Use of multiple applications of MaxCel and Promalin to produce feathered trees. *Compact Fruit Tree* 47(1):23-28.

Duane Greene. 1983. Use of Promalin to increase branching of young trees. *Fruit Notes* 48(2):20-22.

Win Cowgill, Mike Beese, Rebecca Magron, Wes Autio, Jon Clements, and Terence Robinson. 2014. Studies and recommendations for branching young apple trees. *Horticultural News* 94(3):1-9.

**MaxCel and Promalin mixing rates**

| 200 PPM | 400 PPM | 1500 PPM |
|---|---|---|
| 128 ounces/100 gallons | 256 ounces/100 gallons | 960 ounces /100 gallons |
| 1.3 ounces/1 gallon | 2.6 ounces /1 gallon | 9.6 ounces /1 gallon |
| 10 mL /Liter | 20 mL/Liter | 75 mL/Liter |

Generic formulations of the active ingredients in MaxCel and Promalin are available as Exilis Plus® and Perlan®, respectively (both from Fine Chemical). Please note that Perlan rates are the same as those used for Promalin, but Exilis Plus has a slightly higher percent active ingredient, so the rate is about 5% lower (always check the label to be sure).

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