

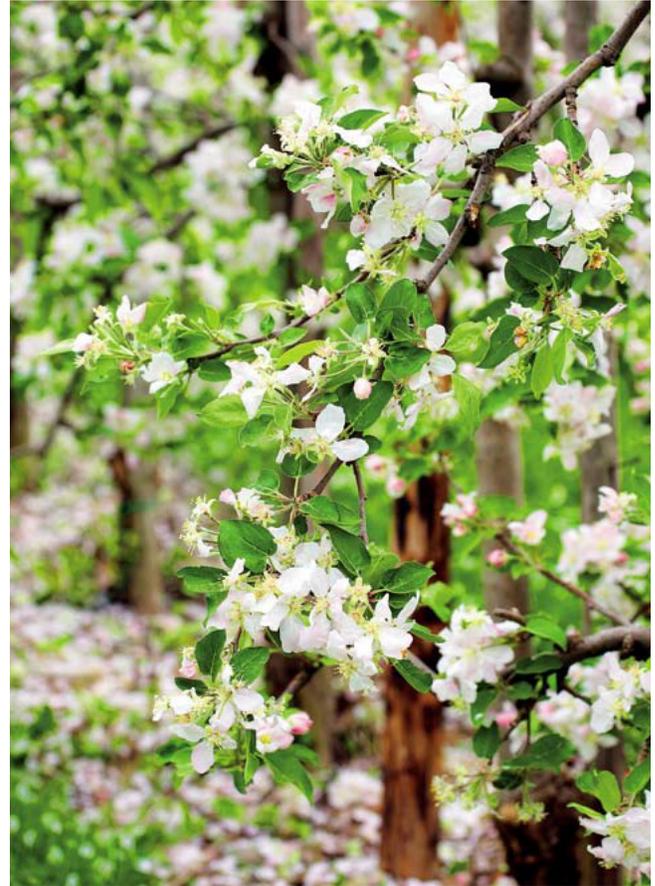
mechanical blossom thinner



ENSURE PROFITABLE HARVESTS WITH INCREASED FRUIT QUALITY AND REDUCED LABOUR BILL!

- Effective chemical-free thinning
- Reduces biennial tendencies
- Better fruit size and quality by increasing the availability of carbohydrates to fewer fruit
- ONLY FEED THE FRUIT YOU ARE GOING TO SELL!
- See the results of your thinning right away
- Fast travel speed ensures high treated area per hour
- Thin in all weather conditions (warm, cool, rainy, night time)
- Can be used for all varieties of tree fruit and their cultivars

Excellent fruit size and quality achieved by mechanically thinning with the **DARWIN PT**



Mechanical thinning with **Darwin** is safer and can be more effective than thinning with chemical substances. It's also quicker and less labor intensive than manual thinning.

The chemicals used to thin pome fruit are costly, and the success of the thinning depends very much upon weather conditions, the ambient temperature and many other unpredictable factors. A second round of chemical thinning is often necessary and is usually followed thereafter by manual thinning. **There are currently no reliable chemical thinning techniques used in stone fruit.**

With **Darwin** you can see your thinning results immediately. You can adjust the level of thinning achieved the first time through the orchard to best fit your production goals.

The machine is powered by the hydraulic system of the tractor. It requires at least 25 l/min. (6 US gal/min) of oil flow to run properly. The hydraulic adjustment of the spindle inclination allows the adaptation to the tree form or to the ground.

The tractor drives closely along the tree rows with the front-mounted spindle directly in the canopy of the tree, and will indiscriminately remove random buds, flower clusters, or individual blooms – leaving behind your desired amount of flowers to set fruit.

Darwin was developed from practical experience and in its almost 20 years of evolution has constantly been optimized and adapted to our customers' requirements. So today you can benefit from a patented, mature system that can help you to produce quality harvests with reduced labor costs and minimized environmental impact year after year!

Research and Development of the DARWIN PT

The PT design was developed by the Fruitec company, but was inspired by questions and comments posed by mid-east US growers and researchers from PSU. The first prototype was produced for research purposes for PA growers in 2007. Because many growers still employ an 'open vase' style training system, the original Darwin was not very useful and needed to be re-designed to be able to thin the tops of trees. The 4th generation model now available is dubbed the "Darwin PT" or Darwin Peach Thinner.

The 'PT' and parent 'Darwin' have been used in research trials and/or grower trials in every major stone fruit growing state in the United States and Canada (ON, QC, BC, NY, MI, PA, NJ, WV, NC, SC, GA, CA, WA, OR, CO).

This research was lead by a team of growers and researchers under the SCRI Banner (Specialty Crops Research Initiative), funded by the USDA and various grower groups, and lead by Dr. Paul Heinemann, PSU.

Shown in the above table are results from 2 years of study in Pennsylvania showing the net economic impact that using the 'Darwin' mechanical blossom thinner can have on peach production.

Grower feedback is quite consistent between growing regions. If the machine is used properly, growers are claiming 50% labour reduction in hand thinning, and a fairly dramatic pack-out difference in size and overall quality.

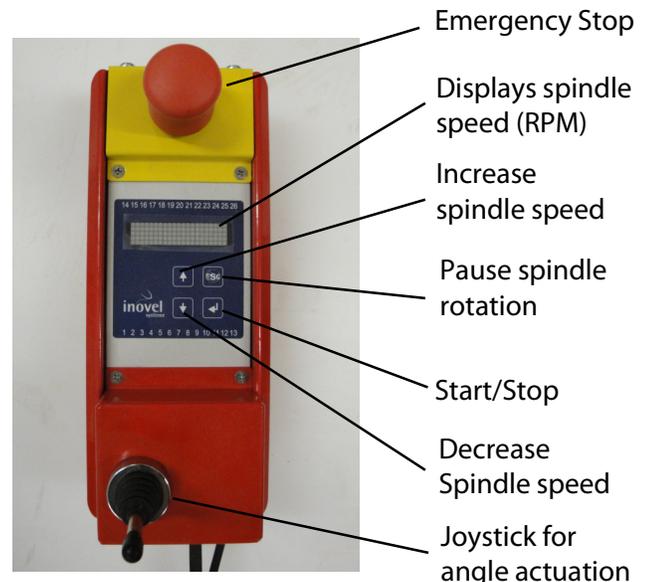
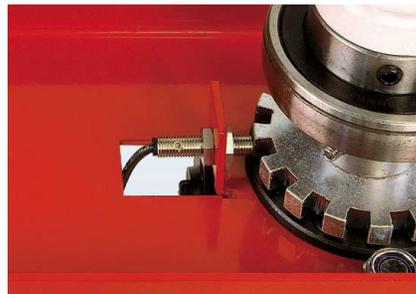
Thinning treatment	Follow-up hand thinning cost (\$/ha) ^z	Thinning savings (\$/ha) ^y	Net economic impact (\$/ha) ^x
<i>'Sugar Giant', 944 trees/ha 2008</i>			
Pink	956	232	876
20% FB*	652	536	1368
80% FB	706	481	1106
Petal fall	657	530	1309
Hand thinned control, 35 DAFB ^y	1186	—	—
<i>'Sugar Giant', 944 trees/ha 2009</i>			
Pink, 150 rpm	178	37	850
Pink, 120 rpm	203	13	462
80% FB	202	13	1031
Petal fall	148	67	154
Hand thinned control, 35 DAFB	249	—	—
<i>'Arctic Sweet', 897 trees/ha 2008</i>			
Pink	1104	151	738
20% FB	953	299	617
80% FB	790	464	1184
Petal fall	840	415	588
Hand thinned control, 35 DAFB	1255	—	—
<i>'Arctic Sweet', 897 trees/ha 2009</i>			
Pink, 120 rpm	321	(9)	205
Pink, 150 rpm	363	(51)	248
80% FB	268	45	149
Petal fall	310	3	123
Hand thinned control, 35 DAFB	345	—	—

^zFollow-up hand thinning cost is based on a labor rate of \$8.50/h in 2008 and \$8.75/h in 2009.
^yThinning savings includes reduced follow-up hand thinning inputs and added mechanical thinner, tractor, and labor inputs. Mechanical thinner cost is based on a 15-year useful life of equipment and 8% interest rate. Tractor cost is \$12.00/h; equipment operator cost is \$12.00/h.
^xNet economic impact (realized economic savings) is defined as cost or benefit beyond hand thinning alone and takes into account reduced hand thinning inputs and increased value of fruit in higher size categories. Values in parentheses are negative.
 *FB = full bloom; DAFB = days after full bloom.

T.A. Baugher, J. Schuup, et al. 2010. Mechanical String Thinner Reduces Crop Load at Variable Stages of Bloom Development of Peach and Nectarine Trees. HortScience 45(9):1327-1331.

The innovative control unit for the DARWIN PT

The Darwin PT is powered by the tractor's hydraulics. The flow of oil is monitored by getting RPM feedback from a sensor at the base of the spindle (below). The oil flow can be increased or decreased from the tractor seat using the digital control unit (shown at right). The joystick on the control unit is used to alter the angle of the spindle. Only one set of hoses is required to power both the spindle, and the cylinder that alters angle. There is a hydraulic flow diverter that moves some of the oil flow from the motor that rotates the spindle to the cylinder that changes the angle.



DARWIN PT mechanical blossom thinner in action



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YouTube Check out our videos on www.youtube.com/mattpetersbartlett to see the machine in action!