Sprayer and Platform Technology

Sprayer Technology

Sprayer technology has moved in a new direction, from airblast sprayers to Proptec and Accutech. Modern sprayers no longer use hydraulic, high-pressure nozzles, but computers to ensure accurate coverage utilizing flow controllers and no-pressure nozzles.

The Proptec 115 Mini 3 Point Sprayer features a uniform 60-70 Micron Droplet and directional air delivery with adjustable pitch blades. It has proven excellent coverage and low drift; it also has low horsepower requirements. This sprayer has multi-row application ability, a 115 gallon capacity, and comes in trailer or 3 point models. BASE PRICE: $15,500

The Proptec Orchard Tower is ideal for orchards, vineyards, citrus, and hops. It is available in 4, 6, 8, and 10 head versions. The 4 head model has a fixed boom, the others have a folding boom that clears 9.5 feet when folded, 15.5 when extended. (Other heights available on request) The tower comes with a standard walking beam axel and a 300, 400, or 500 gallon stainless steel tank that will put out 10 to 200 GPA with reduced drift and drip. This model also comes with a stainless quick remove front cover, Raven rate controller, and high flow sparge agitation. Optional equipment include, a rinse tank, chemical eductor and turning or clevis hitch options. BASE PRICE: $34,500

The Accutech Mini is designed as a vineyard boom. It has a 330 Raven flow rate controller and 300 to 500 gallon tanks. It comes with a hydraulic boom swing, rotatable sprayer heads and stainless steel air deflectors and air shear nozzles. The sprayer sits 18 ft wide, 8 ft high and 15 ft long. BASE PRICE: $21,115

The Proptec T-Boom trailed sprayers do the work of 2 conventional sprayers with only 1 tractor and 1 operator. Designed for vines, bushes and small trees, they use less water and have less drift, which means you can spray in conditions you never could before. They use 200 to 500 gallon tanks and walking beam axels. The rate controller is standard, and they have electro hydraulic control of all functions. There is a choice of a clevis/cv shaft or a turning hitch. The boom clearance is 7 to 10 ft, and fits rows 7 to 12 ft wide. The 4 and 6 head models have booms up to 20 ft wide. You can also get an optional on-board rinse tank. This model boasts production of up to 9 acres per hour! BASE PRICE:

The Accutech Sprayer uses the proven cv hitch with a 3 point hookup. They have stainless steel tanks that are held on by stainless straps connected to a frame that runs the entire length of the tank. It uses a Hypro low pressure-high volume pump with a reservoir. They also use the hydraulic agitation system and a sparger tube with an outside valve and camlock fitting. This means you can fill the sprayer with the tractor and sprayer both off. This model uses the Raven 330 spray monitor and air shear nozzles, with stainless steel fan blower housing and double roller tempken bearings. BASE PRICE: $17,995

These technologies are expensive. But being able to change calibrations quickly and accurately, without touching nozzles is a great advance! Many of the new pesticides are very expensive and require much better coverage than older materials. The small drops provide much better coverage than drops from hydraulic nozzles. The amount of water needed to spray an orchard can be reduced. NOTE: We are NOT saying that you can reduce the amount of water per acre by driving faster!!! You need the newer technology of making small, consistent sized drops, being applied at 2 mph in medium sized trees in order to advantage of the technology.

Platform technology

In Washington State, we are concerned about getting enough labor to pick cherries, pears, and apples. We are even more concerned about how many dollars are invested in labor in every box of fruit shipped.

Platforms will hopefully remove the ladder from the orchard. To make platforms useful, no limbs can be oriented into the drive row. The tree must be two dimensional; forming a precise fruiting wall down the row. It takes too much time to adjust the platform in or out, up or down. Ideally, every worker will have the same amount of work coming to them as the platform moves down the row.

Major challenges to overcome:

New orchards will have to be planted in order to fully utilize the platform's efficiencies. Orchards should consist of fruiting wall with 13 foot centers by 1.5 spacing (V-trellis) or 10 foot center by 3 spacing (Vertical systems).

1. Management will have to decide how and when to do a job so that two to eight persons working on one unit will be equally productive. It only takes a couple of persons without enough to do to render platform inefficient.

2. Most of the current platforms are made in Europe, making service & acquiring parts a challenge. We hope to encourage local manufacturers to make platforms. Several already make platforms pulled by a tractor, but the next step is to have those platforms self-propelled and self-steering. Someday the controls for the platforms will either be on a worker's belt or wrist. This will reduce the need for workers' to stop, look for the switch or lever, and turn back to the work.

Simple designs seem to have more utility. The more complex machines (hydraulic lift, in and out, front and rear steering) seem to be played with more than worked. If the crew is spending time pushing buttons, they are not pruning, tying, or picking.

Recent studies demonstrate the efficiency of the platforms for 3 common orchard operations. Results show a reduction in labor ranging from 25% to 60%. (see chart below)

	Labor Cost ($/acre)		Platform Speed (acre/hr)
Task	Platform	Ladder	
Training	81	182	0.45
Top string tying	29	89	1.31
Pruning	280	400	0.89

Cost do not include cost of machine or machine operation

Wage rate $8/hour
Data is taken off both Peterson and Jr. platforms (2 to 4 person crews)
Both upright and v systems except string tie

Workers observations and concerns:

- Some did not like the platform concept to start, but were sorry to see the machine leave
- Heat and noise can cause additional fatigue
- Tree trainers and pruners noticed repetitive motion fatigue
- Speed controls need to be easily accessed
- Workers reported soreness in feet, legs and back when working on ladders; they reported no soreness in legs or back on platforms
- All workers have acknowledged increase efficiency and productivity when working with platforms
- Platforms are unanimously preferred over ladders by workers

Grower observations:

- Work quality is better with platforms than ladders
- Jerry Haak (grower in Sunnyside, WA) calculated that a single pass over 220 acres would payback the cost of a platform

Further thoughts:

- Supervisors must monitor progress of the platform to ensure that a task is done adequately, not over or under-done.
- A change in forward speed of six feet per minute is very significant.
- The more uniform the canopy, the more the benefit of platforms.
- In uneven canopy conditions the work assignment need to assessed and adjusted to maintain efficiency; management responsibility is easy to overlook and the efficiency will not be achieved.