High Clearance Tractors


Image 1

Waverly Farm settled into its current site in 1997. We previously grew on a smaller site laid out with the intention of harvesting only with a conventional tree spade requiring well spaced plant material to accommodate a skid steer. I felt such a circumstance wasted a lot of ground and wanted to secure a different harvesting system of which many were available. We settled on the European style machine that had an exceedingly small footprint with large ball size capacity.

High clearance tractors have been around for decades. Many were simply 'lifted' tractors made by ingenious farmers to accomplish a variety of tasks. The ability to travel above the crop made activities such as pruning, spraying, cultivating, and later harvesting different row crops more functional and efficient. The development of these machines may at the time have been as innovative as we now see other advances in agriculture such a GPS auto steer. (See image 1)

Plant production nurseries usually seek to utilize their land as efficiently as possible within the constraints of the plants grown. Shade trees require spacing that allows for in the range of 500 or more trees per acre while some shrubs can achieve planting density of 2,000-3,000 plants per acre. Delivering required services to this diverse planting density in an efficient manner requires many different types of equipment.

We chose the small, tracked machine that could navigate narrow rows and select dig any plant we wanted. We bought a machine in 1996 before laying out Waverly to make sure it could do the job. Proving


Image 2


Image 3


Image 4


Image 5

the system, we started planting. (See image 2)

The next unrealized problem to solve was weed control. As the block of plants above shows, weed control in a tight spacing requires special consideration. One solution is to spray over-the-top of the block with pre-

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emergent herbicides: almost always a disappointment. Generally, those weeds listed on the label will be controlled for a period – never long enough. Weeds not on the label will thrive. With over 400 different plants in production, few herbicides can be applied over-the top due to the potential for plant injury. (See image 3)

The photo of the drop spreader, (See image 4) allows us to mix up the chemistry for pre-emergent materials but we still get break though weeds that need to be controlled.

Over the top pre emerge application from two sides of the planting block to avoid 'plant shadows' easily delivered uniform applications but again there will always be breakthrough for unlabelled weeds. You guessed it; the yellow is Prodiamine combined with Gallery. (See image 5)

For post emerge we have used the spray cap seen below with a very narrow tractor. It works great but cannot control weeds between the plants, a failure to meet the objective of a 'weed free' nursery. (See image 6)

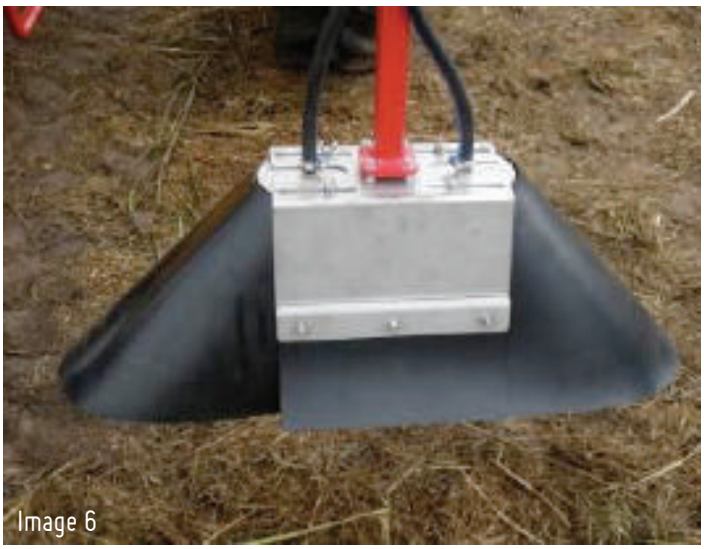
Image 6

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IT'S TIME FOR SHARING (Continued)

For over two decades we have fought hard to be weed free to eliminate the weed competition and to provide the esthetic of a well-maintained nursery – good marketing. We have failed the goal on many occasions. Our solution has been to use pre-emergent herbicides aggressively followed by directed, shielded, hand spraying of post emergent herbicides combined with different chemistry pre-emergent materials. Even with the more modern, long lived pre-emergent chemistry now available, we never solved the problem to my satisfaction. And with horrible labor costs.

Me being stupid. While visiting nurseries in Europe in 1998, I saw the high clearance tractor that would solve the problem. Outfitted with shielded sprayers, the nursery operator could apply pre-emergent and post-emergent herbicides of any chemistry to achieve near perfect weed control. I dismissed what I saw as not practical and probably too expensive. I could have bought the machine with a few years of labor and chemicals saved along with reduced frustration.

Front View

Rear View

Last year, we made the decision to go forward with the high clearance tractor concept.

As you can see, this machine is equipped with three shielded spray heads. The spray heads flex in and out as it encounters plants so that the spray is delivered between plants, not just the aisle. What you can't see is the machine's ability to spread the rear wheels two feet on either side to accommodate various row spacing; we adjust it hydraulically while driving to spray from four-foot to seven-foot rows. The machine is equipped with two sets of spray heads, 50" and 60" wide. The unit has a 210 gallon (800 liter) main tank for what I call the base mix. It also has 2 Dosatron injectors that can add additional chemicals to the main spray stream. This is all managed by a computer that maintains constant gallons per acre regardless of travel speed. The computer monitors travel speed with a sensor mounted to a wheel and injects chemicals from the Dosatrons as a percentage of the final desired spray. Several calibration tests show perfect accuracy of the computer driven delivery system. For example, if we want to use a generalist post emergent herbicide that will kill most weeds but come across a patch of thistle or nutsedge; we can add one or two additional chemicals on a spot treatment basis.

Clearance is 7-8 feet. We still have limitations for example as with shade trees. However, 90% of what we grow is 7-8 feet or less in the shrub offerings. As plants mature to harvest size, the rows become too close for the machine but provide enough shade to limit weed development.

I have been the only lab rat to test out and learn how to use the machine. At first it was totally nerve racking. With mirrors and two cameras we added I have good visibility front and back, but I still had to learn which

blocks of plants I could use the machine in. More vertical growth habits are perfect. More mature plants with low branching are a problem. Of course, I killed and wounded plants but the number was low. After day one, I wanted to put the machine up for sale. After a few days, it feels like driving any other tractor, but constant vigilance is required.

In Europe, labor is scarcer than here and is much more expensive. Typical agricultural land costs $80,000 per acre. Cost control at every level is their watch word. There are many manufacturers of over the top, high clearance tractors. Many nurseries use a high clearance tractor to accomplish many tasks and reduce labor costs significantly.

The machine we chose is manufactured by Damcon in The Netherlands. The basic machine is considered a tool carrier, called a Multitrike, https://www.damcon.com/machine/high-clearance-tractors/, to which many different attachments can be added. Beyond weed control they make digging, pruning, many different spraying systems, cultivation tools, Christmas tree cutting saws, and more.

Some added benefits to using the machine include working in any reasonable wind environment, keeping chemicals off the plants, and delivering all the chemical to the soil surface. The machine navigates like a zero-turn lawn mower; it can turn around with the wheels extended in about 20 feet.

Our second major anticipated use will include shearing of finished hedges. We started the finished hedge program several years ago to be able to deliver mature hedges to our customers. The long story might make a future article. For now, some of the 500-foot-long hedges require regular pruning for shape and density. Although Damcon has not delivered the two different shearing units ordered at this writing, we anticipate we will be able to use them this season. Pictures below are of developing hedges. We have about 4 miles of hedge in production with many being Betulus and Fagus. (See image 9 and 10)

I anticipate a three year pay back from reduced labor and chemical costs for weed management. It is nearly impossible to control chemical usage when hand


Image 9


Image 10

spraying. I do not have enough experience with the cost of shearing hedges manually, but the bottom line is we cannot grow miles of hedges without a mechanical shearing capability.

Now that we have the basic machine it is likely we will add additional tools in the future as we learn how to take advantage of more labor-saving mechanization opportunities.

Check back in a year to see if we are still happy with this purchase.

Jerry Faulring
Waverly Farm
1931 Greenfield Road
Adamstown, MD 21710
310-874-8300