

## Weed Competition and Dust control in Organic Permaculture

As with medicine the first requirement is to do no harm. That means avoiding herbicides that are destructive at their worst and largely ineffective at their best.

The establishment of a diverse cover of vegetation is a vital part of a healthy thriving permaculture. Cover cropping provides a sustainable method of fertilizing and soil building that improves water infiltration and recycles nutrients. Mixtures of plants provide the environment to support beneficial organisms be they bacteria's, funguses, insects and worms that form the web of soil life needed for the long term success of surrounding permanent crops. Nitrogen fixing plants such as clovers, subclovers, vetches and trefoils are essential, as are grasses and other pollen producers to support pollinators and other beneficial insects. The timing and level of mowing are just as important as pruning and training of the trees and vines themselves.

Efficient effective beneficial control of vegetation begins with the choice of the tractor. The ideal tractor needs even weight distribution to minimize compaction. Weight and traction proportionate to actual traction required minimizes compaction and improves fuel efficiency. A low profile allows close work and maximum maneuverability and maximum visibility giving maximum driver improved control and efficiency.



Ferrari Dual Steer Vega 75 (64 HP) shown with BCS Muster double rotor flail mower, weight of tractor and mower equally divided over four equal size drive wheels.



Dual Steer is unique steering system that combines conventional front axle steering with an articulated chassis to give 70 degree turns.



Muster mowers have 2 flail rotors to reduce vegetation to fine mulch and can offset to work under overhanging plants and around obstacles. The Muster can be used in front or behind tractor.



Antonio Carraro SRX 8400 articulated 63 HP bidirectional tractor shown with a rotary mower with manually controlled parallelogram hydraulic offset.

Three makes of tractors offer all these features in their Isometric bidirectional models. Ferrari offers all these features in models from 35 HP to 90 HP Antonio Carraro offers all these features in models from 63 HP to 90 HP. Goldoni offers one model at 65 HP.

Weed and dust suppression by mowing is facilitated by placing mower in front of operator so that grass is mowed before being trampled by the tractor tires. Closer work to trees and vines are possible because mower is where driver can see where mower is at all times. Mowers with manual control hydraulic offset can allow mower to be adjusted to deal with overhang of branches or trellises.

There are a number of mowers designed to mow centers, under tree skirts, as well as the interrow spaces between trees and vines. These can be flails or rotary mowers equipped with outrigger with rotary mower heads. In their simplest form they have a rubber bumper on a rotating guard system so that outrigger can



Bidirectional Goldoni Maxter W70 REV with A.Spedo berm disc



Dutch Perfect Rotary Mower

Note low profile with rounded surfaces of Dutch made Perfect Rotary Mower with outrigger.



Another Perfect designed to reach under large low overhanging canopy.

roll around base of tree or vine. They are mounted on a spring loaded arm that causes outrigger to move back into interrow space after the guard passes tree or vine.

Mounting a more sophisticated flail or rotary mower with a hydraulic sensor, the mower can reach in and mow berm area between trees or vines in the row. These units withdraw from interrow when the sensor wand touches tree or vine. The sensor's touch is so light that bark is not damaged.



Falc Sonar Shredder is a heavy duty flail mower that offsets 16 inches automatically when sensor wand touches tree. All hydraulics are self contained and unit can be used either front or rear mounted. Shown on Antonio Carraro Bidirectional tractor.



Fischer SL90—Front mount rotary mower with sensor controlled rotary outrigger.

and around trees and vines there are many options including berm discs, hoes, tillers and power harrows. As with the mowers the ideal mount is in front of the driver of a bidirectional tractor to facilitate accurate steering and close monitoring of tillage operation, again as with the mowers, rear mounted versions of the same tools are available in many sizes. A few versions can be mid mounted placed just in front of rear wheel of tractor so that operator can look down to monitor operation.

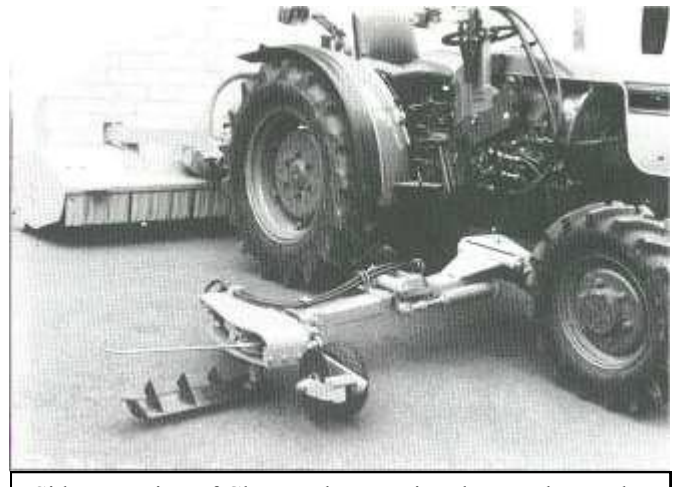
All these same types of mowers can be had in rear mount versions including some able to do inrow mowing in (2) rows at a time. Still other variations can carry spray tanks that time a burst of spray so that it is applied at base of tree only When your cultural practices call for tillage between





Clemens hoe mounted on front of Goldoni tractor leaves 3 pt. free to run mower simultaneously.

The first of these articulating tillage tools to be adopted is the “vineyard hoe” a horizontal blade that cuts an inch or two below the soil surface to kill weeds. Brands like Clemens and Braun led the way. These units work best on lighter soils and where raised berms require them to merely clip tops of raised berms.



Side mounting of Clemens hoe version that reaches under wide canopy to till berm.

The next articulated tiller on the scene is the side-shifting rototiller. Celli was one of the

first in U.S. market followed by Maschio and dozens of others. Generally these have been rear mount but Rinieri offer a front mount version.

Next on the scene is the berm disc tillage led by A.Spedo. These tools consist of a small gang of 17” diameter disc with hydraulic sensor that moves in and out of the berm area to tear up grass. Now that these disc gangs are hydraulically powered not just ground driven, they are very aggressive to take out even the most well rooted plants.



Gramegna articulating rototiller



Rinieri FS-A Front mount rototiller



Rinieri powered berm disc cutting deep.



A. Spedo TPE powered berm disc showing aggressive weed control



Close up of A.Spedo mounted side of tractor working in close planted trees.

The most recent addition to inrow tillage options is the power harrow designed to take out weeds and leave soil flat with little lateral soil movement. Rinieri is the dominant supplier in the type of tillage with front mount and rear mount in dozens of sizes and configurations including models that can do two rows simultaneously.



Rinieri EL 140 tilling berm area. Note sensor has finer sensitive touch.



Rinieri EP works like the EL but works deeper and wider.



Rinieri E-Due is the ultimate in sophistication. It works two rows per pass and has extra sensors that keep machine centered in row by making small lateral adjustments of the entire machine automatically.

Still another berm tillage tool is the Pellenc “Sunflower” that uses a rotary plow that digs just (2) inches deep to uproot weeds. It does not use a sensor system, instead a rotating star shaped plastic guard system contacts trunk and moves spring loaded arm back until cutting head passes plant. Unique shape of guard allows it to work within an inch of vine trunk. Two choices of cutters allows it to work at surface to take down tall weeds or to cut (2) inches deep much like the power harrow.



No sensor is used to go around the vine

Pellenc Sunflower showing smoother shielding and unique guard system.



Pellenc Sunflower shows single rotor with plows