

ORGANIC ORCHARD AND VINEYARD WEED CONTROL

Permacultures such as are found in orchards, vineyards, coffee groves and berry plantings pose a challenge for controlling weeds when herbicides are to be avoided. Fortunately a great many mechanical mowers and cultivators have been developed to control or eliminate weeds within the rows of trees, vines, or shrubs. Many of these tools were commercialized in the mid 1960's and have been improved in the last 40 years.



The first group are mowers designed to keep compatible covers crops clipped short to deny weed varieties a chance establishing themselves in significant numbers, and to prevent them from maturing and going to seed. The simplest form is an outrigger mounted on the side of a mower used to mow the centers.



In these the outrigger is usually a rotary mower driven by a belt or hydraulic motor and mounted on an arm that is spring loaded. A rubber bumper on the blade guard comes in contact with the trunk of the crop plant causing the outrigger to move out and around the plant. Once the blade guard, that protected plant trunk from being damaged, is no longer in contact the spring in the arm pushes the outrigger out to mow the berm area between the crop plants.

The limitations of this simple and entirely functional systems is that spring tension is constant, if one drives too fast the outrigger can bounce when contacting trunk rather than rolling around the trunk as intended. When mowing up steep hills the inertia of the outrigger makes it slower to move outward after passing a trunk and tractor driver must reduce forward speed to compensate.



A more sophisticated version of the outrigger system uses a hydraulic cylinder to deploy the outrigger and uses a wand to contact crop plant and control mower movement. The wand opens and closes a hydraulic valve to control action and impact on crop is extremely light.

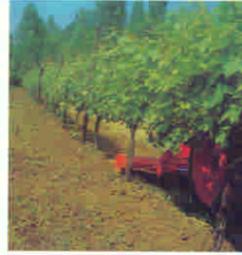
The improved control of this system makes it faster, allowing outrigger to be effective even when plants are quite close in the row. The power of the hydraulic system permits the use of a flail type outrigger as well as the rotary version.



The development of hydraulic lateral control systems permits another mower variation wherein the entire mower rotary or flail can be shifted laterally to mow under low hanging canopies or mow between plants in the row. The lateral control can be driver initiated or by automatic sensor wand. Still another variation is that these mowers can be set in front of the operator as well as behind. A front mount 3pt on more conventional tractors or when mounted on the 3pt of a bi-directional tractor gives driver better view of the operation and hence better control and is less fatiguing.



When tillage is the preferred method of weed control, there are an equally large number of options. Among the earliest systems used are the offsetting rototiller that uses a hydraulic cylinder and sensor to move then into berm area then withdraw them to avoid damage the crop plant. These tillers can be equipped with either conventional "C" or "L" tines or with straight blades that are less prone to smearing the subsoil. These rototillers can be narrow so that only the berm area and a narrow band around the crop plant are tilled or wide so that a good deal of crop row center is also tilled in each pass.



A somewhat more recent development is the offsetting power harrow that uses tines rotating on vertical axis. As with the rototiller these can be designed to do narrow bands or wide enough to do much of the row centers in each pass.



The power harrow offers the advantage of a stirring action that does not smear the subsoil or create a work pan as the rototiller can. Some models can be controlled to work shallower than a rototiller.



When maintaining grass row center is the choice there are several more options for inrow tillage, including hoes, plows and discs. The hoe consists of a cutting blade that undercuts weeds working just a few inches below the berm surface and a sensor system to rotate blade out of the row to avoid contact with crop plant. The horizontal blade can be replaced by a moldboard plow that pulls dirt away from berm and away from crop plant.



Another variation is berm disc, in these machines a small gang of discs are either hydraulically driven or ground driven to disc the berm area and then swing back away from crop plant as they pass it. As with any disc paw they pull dirt in one direction in this case away from the plant and berm line. A later pass with a reversed disc is used to through dirt back toward plant and berm. The berm disc works better than the hoes when you have heavier soil and/or when you are planted flat rather on raised berms.

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P.O. Box 1045
Gridley, CA 95948

(530) 846-6401
FAX (530) 846-0390
www.ferrari-tractors.com