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Cover
Crop
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Equipment to Manage Cover Crops in Annual Rotations

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One of the challenges with incorporating cover crops into annual rotations is uncertainty about which equipment can be used to manage them, specifically around cover crop termination. Last year UCCE Farm Advisors Sarah Light and Amber Vinchesi-Vahl hosted an equipment showcase field day specifically for cover crop management. One of the presenters was Brian Park from Park Farming Organics. Brian has been managing cover crops for many years and shared some of his experience with the equipment they use. In this article we share photos and descriptions of some of that equipment for those who weren't able to make it to the field day. In this article, a range of equipment is described, some that are more widely used for row-crop farming operations, and others that are more specialized for biomass and residue management. All photos are courtesy of Brian Park.

Lopez Coulter Sled

This implement is used in the spring under light cover crop conditions (low biomass, not very stringy). The double set of coulter blades cuts material and lightly mixes soil with residue. There is a "lawn mower" style roller on the back, also known as a crumbler. It helps mix cover crop residue in with the soil and levels the bed off for the next cash crop. This implement does not work well under very wet conditions because the coulter blades are at an angle and get plugged up more easily if there is dew in the residue or the soil is wet. Normally driven at 4-6 MPH.



Unverferth Ripper Stripper

This tool covers three 60-inch beds at a time and works the center of the bed (can't be used on drip irrigated fields). It has a single coulter in the front of the chisel point and two coulters on each side, which have adjustable angles so residue can be controlled. On the back end of the implement is a crumbler/squirrel cage that crumbles any large clods that get through the disks. This tool works in most soil conditions, wet or dry, and works well at higher speeds (6-7 MPH). It is an implement that can be used in the fall and spring depending on environmental conditions and the following crop. It is typically used to prep beds prior to cash crop planting on lighter

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ground to help loosen up soil prior to planting and to ensure adequate oxygen for the next crop (usually in advance of tomato). This tool can also be useful with managing high amounts of residue in the fall or spring. Shorter shanks are substituted in higher moisture conditions to reduce excessive soil disturbance after winter rains. In the fall, when the soil is drying, a longer shank can be used to rip deeper soil. The Unverferth Ripper Stripper can be used to prep beds for planting a cover crop after a cash crop, or to incorporate cover crop residue. It does not disturb all the soil in the field, but rather the soil in the planting row, so disturbance is minimized.



Yetter Strip Till

This is a vertical tillage tool that can be used to incorporate cover crop residue in the spring during wet years. It is very efficient, and with one pass of this tool after chopping the cover crop, a bed is ready for planting a row crop. While residue will stay in the non-planted part of the beds and in the furrows, this implement provides an efficient way to terminate a cover crop and plant the following crop quickly following a wet winter/spring, when time is of the essence. Then, at a later date, the remaining residue can be managed once conditions dry down. As pictured, it is set up for crops that would be planted in two rows on a 60" bed (corn, beans, etc.) but the vertical tillage gangs are adjustable on the tool bar and can be set at different spacings.



Davis Machine Furrow Mower

This implement is helpful for managing cover crop residue in the furrow that most choppers can't reach. It is a front mount mower that chops biomass and residue in the furrow and does not disturb soil in the beds. This implement cleans up residue in the furrows to prevent plugging of subsequent equipment used for other farming operations. If the soil is wet and beds can't be worked without damaging soil structure, this will clean up furrows without affecting soil in the beds. This implement works well with green succulent covers but not so much with dry covers because the fibrous dry material wraps around the tool and it gets plugged up. Great tool to use when trying to minimize soil disturbance and reduce "plugging" of following passes. It is used in the spring to incorporate cover crops. Depending on how thick the residue is, this implement works most effectively at 3-4 MPH.

Rears Pak Flail Mower

This mower works well to cut cover crop biomass into small (2-3") pieces in the spring at termination and is the first piece of equipment to be used at termination. This mower speeds up cover crop residue breakdown because the smaller residue size has more surface area that microbes can access for decomposition. When the mower is set to a taller height, the implement can also be used to control weeds during the winter in a cover crop stand by raising the mower above the cover crop canopy. The mower can cut off the inflorescence on weeds before they set viable seeds, reducing future weed pressure. This tool can also be used to effectively chop cash crop biomass following harvest in the fall, before cover crop planting. It is most efficient when the beds are level to ensure all residue can be mowed evenly, reducing the risk that large chunks will remain in the field. Keep knives sharp to keep this mower working most efficiently. Speed depends on the amount of biomass in the field. If heavy, 2-3 MPH, and if light biomass, 4-5 MPH.



Full Bed Lilliston with Bed Knife

This implement has been set up as a Lilliston tool with a bed knife in the front and works three beds at a time. It is a light piece of equipment and won't work well with very heavy cover crop biomass. However, in the right conditions, it handles cover crop residue well during incorporation in the spring and leaves beds level. Light cover crop stands (non-fibrous materials) can be efficiently terminated at higher speeds (6-7 MPH).



GP Turbo Chisel

The GP Turbo Chisel is an implement with coulter blades in the front, followed by chiselers, and finally a crumbler in the back. It will heavily disturb soil and degrade soil structure, so shouldn't be used unless necessary but is useful for heavy ground, following rice, and when there are issues with compaction. It works well as a tillage tool in both the fall (to prep for planting cover crops) or late spring (to terminate cover crops). It can handle plant matter, loosen up the ground, and mix soil with cover crop residue in one pass. If planting on beds, re-listing is needed after running this equipment. A higher horse-power tractor (300+ HP) is needed to run this implement. It works efficiency at higher speeds (5-7 MPH).



JD 16' foot Disk

This disk has been around for a long time and doesn't have hydraulics. It is more narrow than some other comparable implements (16' wide) but is very dependable and efficient. It doesn't require high horsepower (120 HP) so you can use it with a tractor with narrower tire spacing and not drive on the beds. It has a light frame and terminates cover crops with minimal soil compaction and soil disturbance (it won't flip the soil but will lightly mix residue with soil). This implement works well when incorporating any (heavy or light) cover crop residue in the spring. Can go up to 5.5 MPH.

Horsch Joker Disk

The Horsch Joker Disk is a disc with fixed blades in the front and a roll flex packer in the back. The roll flex packer stabilizes the discs and determines disc height. The higher the packer, the deeper the discs will run in the soil. The lower the setting, the more shallow the cultivation. This tool will efficiently break up cover crop biomass. A furrowing disc can be added to the back of this implement to clean up furrows while terminating the cover crop. It is on a three-point hitch system so it can be easily turned at the edge of the field without driving over beds and transferred from field to field quickly. The joker runs best between 7-10 mph. Thus, this equipment makes for efficient and fast cover crop termination in the spring.

