

## COVER CROP MULCHING, MINIMUM TILLAGE AND ORGANICS

### Key points

- Legume cover crops are beneficial for subsequent vegetable crops providing high levels of nitrogen.
- Corn and pumpkins can be very successfully sown into a mat of vetch/cereal stubble/mulch.
- Tomatoes grown in a hairy vetch cover crop mulch are very successful.
- Cover crop kill options include herbicides or mechanical means; vetch can be killed mechanically by rolling or mowing; cereals (rye) by undercutting (5 cm soil depth) or by using ongoing inter-row mowing. Without herbicides a commercial crop of zucchini can be grown successfully under cultivation or under no tillage with a vetch or subterranean clover cover crop.
- Vetch and ryecorn cover crops should be rotated.
- Cover crops increase the management requirement. Good timing and successful cover crop kill is essential.

Ed Beste, a weed specialist from the University of Maryland, USA, presented a seminar on the use of minimum tillage and cover crops by vegetable farmers, and how this technology can be used by organic farmers.

### Challenges

No tillage became rapidly adopted in Maryland in the 1970s to reduce wind blow and drifting of soils. The other challenge, especially for organic farmers, is to reduce chemical use while gaining the advantages of using cover crops and minimum tillage practices.

### Cereal cover crops

Initially gramoxone was used, then glyphosate, to kill the cereal cover crop when it was 30 cm in height. Tomatoes and melon establishment was found to be superior when planted into cereal cover crops compared with planting into cultivated ground. Rye can be used inter-row to provide shelter for vine crops. Presently there is no organic alternative to herbicide use in this method. Mowing is an option.

### Legume cover crops

Zucchini seed can be direct sown into a legume cover crop then the cover crop mulched. Mulching kills hairy vetch plants. Clover is harder to kill mechanically, although sub clover can be killed in some US systems using a high speed flail mower. Crops grown successfully after legumes include zucchini, sweet corn and pumpkin.

Vetch and oats are a successful cover crop. A straw chopper can be used to kill cereals and legumes and reduce soil erosion. Crops can then be transplanted into the residue. A roller system can also be used.

### Soil temperature

Records show that soil temperature differences at 5 cm between cultivated and cover crop/no tillage

ground were very small. Reduced heat loss at night is thought to balance lesser heat gain during the day under no tillage in very sandy soils. On heavier soils, soil temperature can be lower under cover crops but temperature fluctuations are less than unmulched. A mulch spreader can be used to move mulch away from the crop row to allow soil temperature increase.

### Moisture retention and organic matter

Cover crops should be killed two weeks before crop planting to allow moisture accumulation. If there is no rain after the cover crop is killed, irrigation is required before sowing or transplanting. The cover crop mulch provides very high moisture retention during the crop growing season. Irrigating the mulch aids the release of nutrients from the mulch and may be necessary to gain the full benefit of the mulching. Soil organic matter was higher under cover crops than under cultivation.

### Weed suppression

Subterranean clover provides better weed suppression than vetch. Nitrogen supplied by legumes is available to weeds as well as the crop. A suitable rotation should be used to avoid and deal with weed build up e.g. potatoes provide effective weed control.

### Pests

Slugs are a problem with corn but not with pumpkin. Fine lime can be applied to the crop at night to control (desiccate) slugs. (Approximately 1000 kg/ha total application.)

More information can be found at this website <http://nimss.umd.edu/homepages/home.cfm?trackID=30>

Seminar notes by Sue Cumberworth [sue@agribusinessgroup.com](mailto:sue@agribusinessgroup.com) and Tim Jenkins [tje@donaghys.co.nz](mailto:tje@donaghys.co.nz)