COVER CROP-BASED PRODUCTION OF VEGETABLE CROPS

Dr. Ron Morse, Virginia Tech Horticulture Department





COVER CROPS FOR SOIL HEALTH

RECOMMENDATION: GROWERS SHOULD CONSIDER OFF-SEASON PRODUCTION OF COVER CROPS OF <u>EQUAL IMPORTANCE</u> AS IN-SEASON PRODUCTION OF CASH CROPS (vegetable, flower and small fruit crops).

SOIL HEALTH DEFINED

"Soil's capacity to consistently produce high crop yields, using few off-farm inputs, with little or no harm to the environment."

MAINTAINING SOIL HEALTH

- SOIL HEALTH is dynamic; it can be managed.
- SOIL HEALTH declines during production of cash crops.
- SOIL HEALTH is restored when cover crops are produced during the off-season.





ROLE OF CONSERVATION AGRICULTURE (CA)

CA is a philosophy, with specific objectives and practices, designed to sustain and promote soil health.

COVER CROPPING IS PART OF ALL THREE OBJECTIVES OF CONSERVATION AGRICULTURE:

- Minimize soil disturbance (reduced tillage)
- Maximize year-round soil coverage
- Maximize farm and field plant diversity

METHODS OF ESTABLISHING COVER CROPS

Seed drills function <u>best</u> to distribute different sole or mix (cocktail) of cover crops in ADJACENT ZONES of field beds.

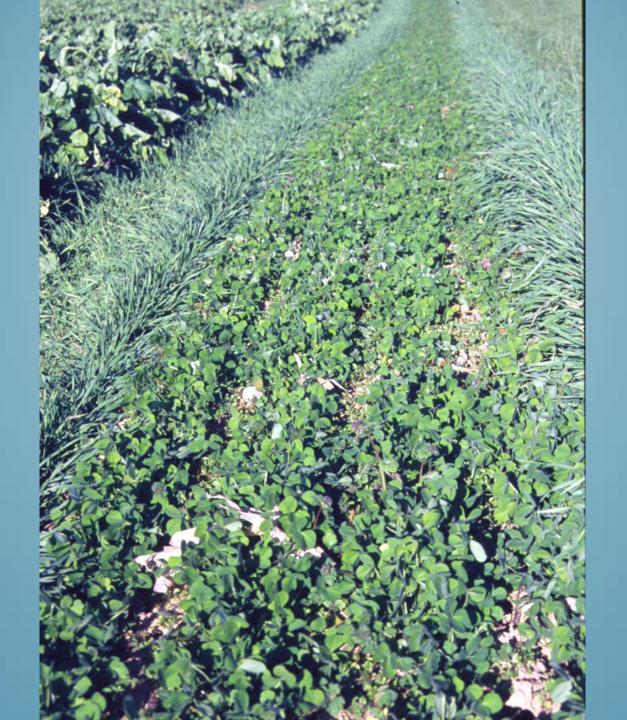


GROW ZONES AND TRAFFIC ZONES DEFINED

GROW ZONES: space (2-4 ft wide), where legume cover crops and succeeding cash crops are grown.

TRAFFIC ZONE: space (2-3 ft wide), between grow zones, where grass cover crops are grown and retained as a living or dead mulch.





COVER CROP-CASH CROP SEQUENCES

IN GROW ZONES:

- Legume-based cover crops are grown.
- Cover crops are killed and managed.
- Cash crops planted in NT or ZT systems.

- No two cover crops are alike.
- Long-term planning is important to grow the best cover crops for each type of cash crop (spring, summer or fall).

SPRING VEGETABLES: Onion, Pea, Irish potato

WINTER-KILLED summer cover crops are best:

Examples: Berseem Clover & Spring Oats, Forage Radish & Spring Oats—seeded in July or August of the previous year.





SUMMER VEGETABLES: Tomato, Pumpkin

WINTER cover crops are best.

Examples: Crimson Clover & Barley, Hairy Vetch & Rye, Austrian WP & Triticale—seeded in Sept/Oct of the previous year.







FALL VEGETABLES: Cabbage, Broccoli

SUMMER cover crops are best.

Examples: Cowpea & Foxtail Millet, Sunn Hemp & Sorghum-Sudangrass—seeded in May or June of the current year.











COVER CROP-CASH CROP SEQUENCES

Wide Zone-Till is Recommended, Because:

- Zone-till equipment is available and affordable.
- Likelihood of success is high, especially if plastic mulch is used to cover the tilled grow zones.
- Living or dead grass-based cover crop mulch is grown and retained in traffic zones.







MAKING NO-TILL WORK ON SMALL FARMS

FOUR STEPS TO SUCCESS:

ONE: Produce uniform, high-residue cover crops (3 or more tons/acre).

TWO: Kill cover crops, leaving a uniform, dense mulch.

THREE: Establish cash crops by hand, or use no-till transplanters or seeders.

FOUR: Manage weeds, using high-residue mulch, and/or herbicides.