



## COVER CROP PROGRAM

King's Agriseeds - ***Designing Cover Crop programs for your farming system.***

Proven Mixtures, Diverse Species, Experienced Support

### **Cover Crops for Vegetable Growers**

**Dave Wilson, Research Agronomist**

Vegetable production involves many practices that compromise soil health, and can limit productivity. King's Agriseeds' recommends that vegetable growers use cover crops to maintain soil health. Late summer is one of the best opportunities vegetable growers have to establish a legume cover crop to supply the following year's nitrogen needs. Late summer provides time for the legume to establish in the fall. Legume winter cover crops provide a great deal of nitrogen. If well managed, they can provide as much nitrogen to the next crop as fertilizer containing 50 to 100 lb. per acre of nitrogen. If let grow longer into the end of May or June these legume cover crops can contribute 75 to 125 lbs. per acre of nitrogen. Whether you are committed to raising all your nitrogen on the farm, or concerned about paying today's high prices for nitrogen fertilizer, that nitrogen contribution looks attractive. Other cover crop choices are choices to use as winter killed cover crops, Jerry Oats and Daikon will leave a winter killed mulch for the fields that need a very early spring tillage and planting. Their fall growth will help recycle nutrients and build soil organic matter before winter.

An intense vegetable cropping system removes large amounts of nutrients from the soil. Long-term fallow periods to naturally improve soil quality can be very beneficial, but are not always practical or cost effective. Therefore a crop rotation is needed that can grow the maximum amount of vegetables while including cover crops to help improve the soil quality. Vegetable growers can improve farm productivity and profitability using cover crops by improving crop rotations by planting cover crops between harvest of one crop and the planting of the next. A cropping system that includes cover crops will improve soil quality and pest management through enhanced biodiversity and nutrient recycling and enhance the long-term viability of the farm while protecting the environment from nutrient leaching. Cover crop biomass will reduce nitrogen fertilizer requirement and improve the amount of organic matter inputs into the soil for enhanced soil organic matter over the long-term. King's Agriseeds has a diverse group of cover crops to fit into your rotation for either early spring or late planting rotations.

Some of management goals that farmer use cover crops for:

- Suppress weeds
- Protect soil from rain or runoff
- Improve soil aggregate stability



#### COVER CROP PROGRAM

- Reduce surface crusting
- Add active organic matter to soil
- Break hardpan
- Fix nitrogen
- Scavenge soil nitrogen
- Suppress soil diseases and pests

After vegetable harvest plant a cover crop to compete with late summer and winter annual weeds, recycle nutrients to prevent losses and establish beneficial roots to hold the soil penetrate and loosen compacted hardpans and build soil organic matter.

Plan your cover crop in front of next years' rotation. For fields that need to go to vegetables in May or earlier use a winter killed cover crop (Sorghum-Sudangrass, Buckwheat, Jerry Oats, Daikon radish) or a vigorous overwintering cover crop (Annual ryegrass, triticale) that scavenges left over nitrogen.

Matching the seasons of vegetable crop production with the planting of the appropriate cover crop can be challenging. Vegetables such as onions, lettuce, cabbage, broccoli, radishes, beets, carrots and potatoes are planted early. Winter annual cover crops are usually not an option, with these crops a fast growing annual at the end of the previous harvest season may be an option.

**Sorghum-Sudangrass, Buckwheat, Jerry Oats, Daikon Radish** are choices to use as winter killed cover crops, Sorghum-Sudangrass, Jerry Oats and Daikon will leave a winter killed mulch for the fields that need a very early spring tillage and planting. Their fall growth will help recycle nutrients and build soil organic matter before winter.

As a cover crop, **Sorghum-Sudangrass, Buckwheat and Daikon Radish** can be sown after vegetable harvest up to mid-August. **Daikon Radish** can be planted later as well but for maximum root growth benefit it should be planted in August. **Daikon** is a good choice to break up hard pans and aerate the soil. **Jerry Oats** can be sown August through first week of September, this will produce a quick cover in fall and then will provide a winter killed residue.

If Potatoes are planned the following year, consider a break crop of **Braco white mustard**, this crop is a bio-accumulator and Biofumigant. It recycles and accumulates nutrients to the upper topsoil. When the green material is chopped and turned into the soil it will give a bio-fumigation effect to reduce nematode and rootworm pressure.



## COVER CROP PROGRAM

**Annual ryegrass** is a good cover crop for continued planting after harvest until the third week of September. Deep growing over-wintering roots help recycle Nitrogen, break up hard soil and add organic matter. It grows to compete late summer and winter annual weeds. **Marshall** and **MO1** varieties will provide winter and early spring cover.

**Triticale** and **Rye** can be planted until Mid-October after later harvested crops; they will provide winter cover, recycle nitrogen and build soil organic matter.

### **Late summer legume cover crops or mixes for overwintering**

For fields where nitrogen is needed and vegetables will be sown or transplanted in late May to mid-June the following year, then over wintering legumes will provide nitrogen for a plow down the following year. Winter annuals or perennials will work best before warm season vegetables such as sweet corn, peppers, tomatoes, sweet potatoes, cucumbers, melons, squash and pumpkins. These Vegetable crops may be planted late enough to allow some spring growth from the perennial or winter annual cover crops before tillage which will improve soil organic matter and nitrogen content of soils.

### **Hairy Vetch, Crimson clover, Three way clover mix, CARGO mix (Crimson, Annual ryegrass, oats)**

For **over-seeding** in August of late harvested vegetables "**Three way clover mix**" is the best option, it has the ability to establish in shade after broadcasting on the soil surface. If the soil is dry "**Three way clover mix**" will do better at establishment because it needs less moisture to germinate than the large seeded hairy vetch.

**Hairy vetch & Oats** should be drilled and best follows harvest and incorporation of the vegetable crop. A no-till drill can be also be used to cut through vegetable crop residue and plant hairy vetch to avoid tillage. Plant this till mid September.

**CARGO mix (Crimson, Annual ryegrass, oats)** provides a quick cover with oats, the crimson and annual ryegrass will over winter, recycle nutrients, build organic matter. Crimson clover will fix and add nitrogen. This is a great grass-legume green manure crop, used to prevent erosion and build soil. Best if drilled from August to mid-September.

**Broadcaster mix (Crimson Clover, Annual Rye Grass, Medium Red Clover, Yellow Blossom Sweet Clover and Daikon Radish)** this is a diverse mix for varying soil conditions and will adapt year to year depending on conditions. This can be broadcast into standing sweet corn or under seeded in between rows of tomatoes or other vegetables. Also it can be drilled in late summer after vegetable production. This mix can be seeded from August to the end of September in southeastern PA, in southern locations WV, VA and MD it can be planted until the end of October, early seeding being important in northern areas to ensure that the plants (primarily the crimson

clover is well established before freezing weather occurs), frost heaving is especially damaging to young clover plants, the oats and annual ryegrass should help to prevent some of the frost heaving. The mix is adaptable for broadcasting to many soil types. Use as a cover crop and/or green manure, sequester carbon and help build soil structure. Deep growing annual ryegrass roots scavenge and recycle nitrogen break up natural hardpans (fragipans) and manmade plow-pans or compacted layers; roots can grow down 3 to 4 ft. between planting time and the following spring. Compaction fighter, both deep growing annual ryegrass roots and extensive taproots of clovers grow up to 1 ft long, with branches that may penetrate 5 ft deep to aerate subsoil and lessen negative effects of compaction. Crimson clover germinates fast, grows fall cover and overwinters. Red clover will grow well in cooler and moist conditions and will overwinter. Yellow blossom sweet clover is a biennial that will grow well in cooler and moist conditions and is more droughts tolerant of other cover crops and will also overwinters.

### **Early Spring Planted**

**Spring Champion** (Hairy vetch, Oats and Field Peas) can be sewn in spring as soon as you can get in the soil to plant. This mix can grow a lot of nitrogen rich biomass to be turned under in Late May/early June before the planting of summer annuals or before the “Second planting” of tomatoes, sweet corn, and melons.

### **Short-term Crop rotation benefits**

Vegetable growers can improve short-term crop rotations by planting cover crops between the harvest of one crop and planting of the subsequent crop. During the late spring-summer months as some vegetable crops are harvested a quick growing crop of “Quick-Cover” sorghum-Sudan grass can grow 1.5 to 3.5 tons of dry matter in 35 days which can be incorporated into the soil before planting late summer brassicas or fall greens. For an easier to work summer cover crop Buckwheat can be planted and in 5 to 6 weeks then can be disked into the soil. Buckwheat makes nutrients available for the next crop and its fibrous root system is beneficial for soil aggregation.