

# MULTI-SPECIES COVER CROP DECISION TOOL:

## ADAPTED FOR CORN SILAGE SYSTEMS

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Have questions about cover crop mixes?

Give our office a call, we are happy to help you.

There is increasing discussion of using multi-species cover crop tools as a way to optimize the soil health and conservation benefits of cover cropping. Recent work at UVM Extension supports that this practice can be beneficial, however getting good establishment of the cover crop is crucial to see the 'fruit' of these practices. The most popular cover crop used in this region is winter rye (*Secale cereal*). Farmers attempting to decide how to diversify their cover crop mixes may be overwhelmed by the abundance of options and lack of clear guidelines for our region. Additionally, 'optimum' seeding rates can be variable based on a farmer's goals. While this guide was created specifically for corn silage systems, it can be adapted to other crops such as soybeans. Ultimately farmers will have to try it out on their farm and decide what works in their conditions, with the understanding that there will be year to year variation with weather fluctuations.

### Important Considerations:

1) When will the cover crop be planted, 2) How will the cover crop be planted, 3) How will the cover crop be terminated, and 4) What are the primary goals of the mix. Cost will have to be weighed with objectives and the consideration of likelihood of success. Good seed to soil contact will make the investment pay. Broadcasting will require higher seeding rates.

### Species Considerations:

**Substituting Wheat or Triticale for Winter Rye:** Winter rye consistently provides fall and spring biomass. In harsher winters and when terminating earlier in spring, winter rye is more reliable and produces more spring biomass. In less harsh winters, winter triticale may produce more spring biomass if planted early and terminated late. Feed value of winter triticale or winter wheat may be greater but will generally mature later than winter rye.

**Type and Use of Legume:** The nitrogen-fixing properties of a legume has to be weighed against the cost, particularly when broadcast. For example, hairy vetch is better established drilling and probably isn't worth the cost if broadcasting. However, when drilling, you will want to make sure you have sufficient time after planting before hard frost for fall growth; otherwise it may not be worth the investment. Winter peas also have better success early, but should be planted for best establishment. Small seeded clovers may not visually produce as much biomass as desired, but may actually make the grass perform better than grass by itself. Surprisingly, crimson clover overwintered the second year of our trial, but typically is not winter hardy in this area.

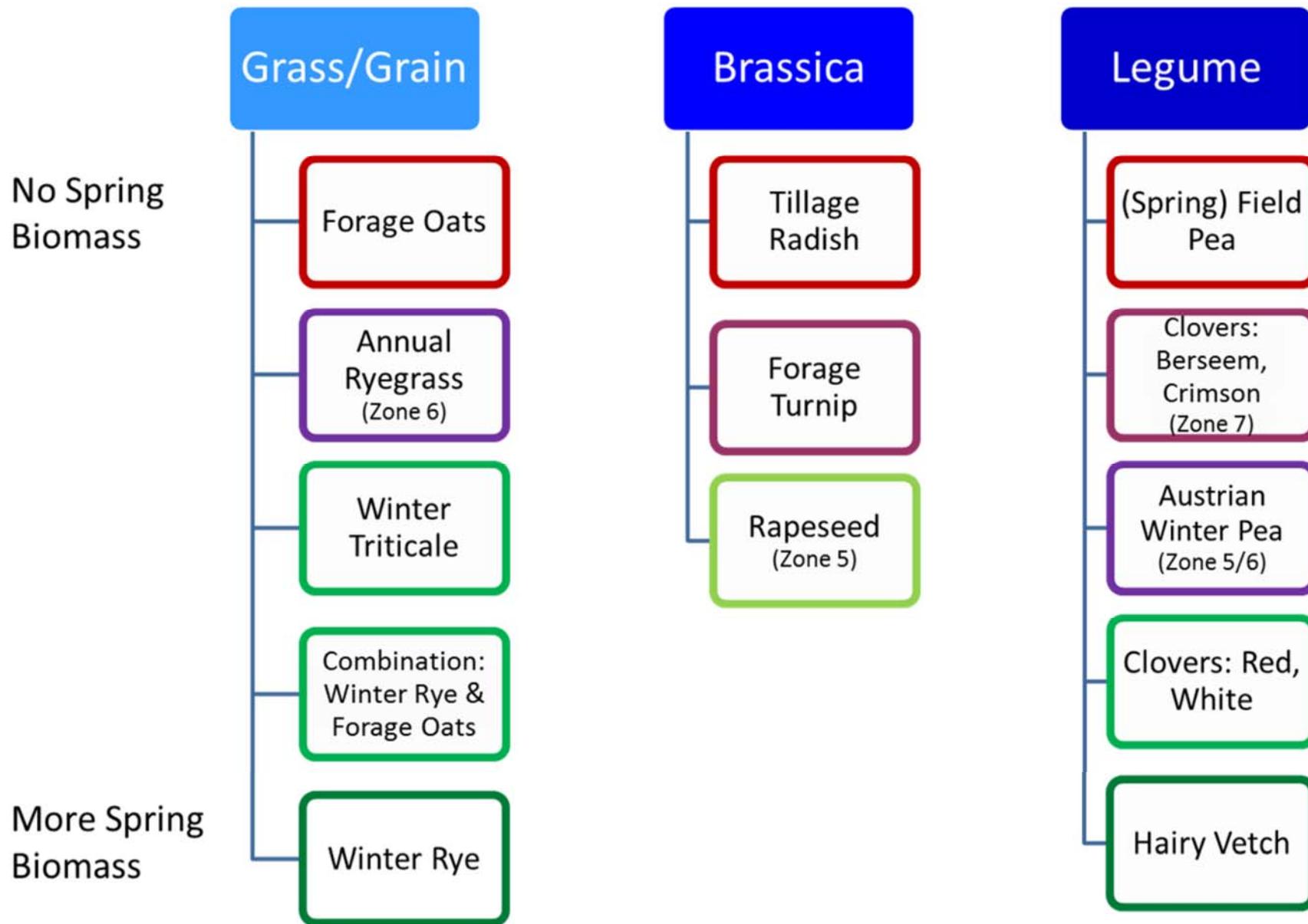
**Type of Brassica:** Radish is a winter-killed brassica in our region. Radish produces a good taproot when planted early (i.e. August), and a pencil sized root when planted later (i.e. late September). Rapeseed and forage turnip had better success than radish in our trials comparatively when broadcast, and those mixes broadcast or drilled seemed to stimulate winter rye growth in spring. Rapeseed produces more above ground biomass as opposed to below ground biomass. Both rapeseed and turnip over-wintered during the second year of our trial, which was mild. Mustard is a good brassica for the specific purpose of biofumigation, but for the purposes of soil conservation, costs more and produced less biomass in our trial.

**Annual Ryegrass Termination/Weed Concern:** In southern climates there is a concern of annual ryegrass becoming a weed. In our region we typically think of annual ryegrass as being winter-killed. However, in mild winters it will likely over-winter. Termination strategy must be considered when using annual ryegrass. When broadcasting, it has shown some promise over winter cereals with better establishment, though that can vary yearly.

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# A Relative Ranking of Select Cover Crops Based on Spring Biomass

Red: Winter Killed → Dark Green: Abundant Spring Biomass



# Drilled/Planted Cover Crop Decision Tree

## Drilled Cover Crop

How much biomass do you want in the spring?

**Winter Killed –  
No Spring Biomass**



**Moderate Spring Biomass**

Are you harvesting, grazing or rolling-crimping your cover crop?

**High Spring Biomass**

Planting by Sept 1<sup>st</sup>  
Utilizing a Legume for  
N-Fixation

Planting by Sept 15<sup>th</sup>  
Not Investing in a Legume

Planting by Sept 1<sup>st</sup>  
Utilizing a Legume for  
N-fixation

Planting by October 1<sup>st</sup>  
Not Investing in a Legume

Planting by Sept 1<sup>st</sup>  
Utilizing a Legume for  
N-fixation

Planting by Sept 15<sup>st</sup>  
Not Investing in a Legume

Forage Oats – 30 lb/ac  
Field Peas – 25 lb/ac  
Radish – 5 lb/ac

Forage Oats – 60 lb/ac  
Radish – 5 lb/ac

Forage Oats – 40 lb/ac  
Winter Rye – 40 lb/ac  
Vetch – 10 lb/ac

Winter Rye – 50 lb/ac  
Winter Pea – 25 lb/ac  
Radish – 5 lb/ac

Forage Oats – 40 lb/ac  
Winter Rye – 40 lb/ac  
Forage Turnip – 4 lb/ac

Winter Rye – 75 lb/ac  
Vetch – 10 lb/ac  
Rapeseed – 5 lb/ac

Winter Rye – 125 lb/ac  
Radish – 5 lb/ac

*If planting by  
inter-seeded  
or broadcast  
see next  
page instead.*

*\*Always consult with  
NRCS when approving  
multi-species cover  
crop rates for EQIP  
conservation  
contracts.*

# Inter-Seeded/Broadcast Cover Crop Decision Tree

## Inter-Seeded Cover Crop

How much biomass do you want in the spring?

**Winter Killed – No Spring Biomass**



**Moderate Spring Biomass**

Are you harvesting, grazing or rolling-crimping your cover crop?

**High Spring Biomass**

Utilizing a Legume for N-Fixation

Not Investing in a Legume

Utilizing a Legume for N-fixation

Not Investing in a Legume

Utilizing a Legume for N-fixation

Not Investing in a Legume

Forage Oats – 40 lb/ac  
Field Peas – 30 lb/ac  
Radish – 5 lb/ac

Forage Oats – 85 lb/ac  
Radish – 5 lb/ac

Annual Ryegrass – 15 lb/ac  
Crimson Clover – 5 lb/ac  
Radish – 5 lb/ac

Annual Ryegrass – 15 lb/ac  
Winter Pea – 30 lb/ac  
Radish – 5 lb/ac

Annual Ryegrass – 20 lb/ac  
Radish – 5 lb/ac

Winter Rye – 50 lb/ac  
Forage Oats – 50 lb/ac  
Forage Turnip – 5 lb/ac

Winter Rye – 100 lb/ac  
Vetch – 10 lb/ac  
Rapeseed – 5 lb/ac

Winter Rye – 140 lb/ac  
Radish – 5 lb/ac

\*Always consult with NRCS when approving multi-species cover crop rates for EQIP conservation contracts.

Annual Ryegrass should be planted by July for the most successful inter-seeding.  
Cereal grains should be planted in August for the most successful inter-seeding.



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