

## Objectives

- **Soil erosion preventer**
  - Plant as early as possible (before Aug. 15)
  - Select winter-hardy cover crop
- **Soil builder**
  - Increase soil organic matter
  - Improve soil structure
  - Increase living organisms
- **Reduce soil moisture(wet years),conserves moisture dry years**
- N source and N scavenger
- **Grazing value**
- Weed fighter
- Diseases controller
- **Enhance wildlife/pollinators**

## Cropping system/Tillage/Location

- **No-till or conventional**
- **Current crop/next cash crop**
- **Planting window**
  - Prevented Planting (warm- and cool-season)
  - Before August 15 (warm- and cool-season)
  - After August15 (cool-season)
- Herbicide carry-over (restrictions)
- Soil type and limitations
  - Heavy clay
  - Saline



## HOW TO SELECT A COVER CROP OR COVER CROP MIX?

Dr. Marisol Berti, PI  
*Professor*  
*Forages and cover crops  
production research*  
[Marisol.berti@ndsu.edu](mailto:Marisol.berti@ndsu.edu)

**Professional  
Development Program**  
“Enhancing Soil Health  
with Cover Crops in North  
Dakota”

[https://www.ag.ndsu.edu/  
plantsciences/research/fo  
rages/cover-crops](https://www.ag.ndsu.edu/plantsciences/research/forages/cover-crops)

**Funding Source:**

NORTH CENTRAL  
**SARE**   
Sustainable Agriculture  
Research & Education

## COOL-SEASON COVER CROPS/FALL PLANTING

Cereals/ grasses	Brassicas	Legumes (Nfix)	Others
<ul style="list-style-type: none"> <li>• <b>Winter cereal rye</b> (E, S, Nsc, M)</li> <li>• <b>Winter triticale</b> (E, S, Nsc, M)</li> <li>• <b>Triticale</b> (E, S, Nsc, G)</li> <li>• <b>Barley</b> (E, S, Nsc, G)</li> <li>• <b>Oats</b> (E, S, Nsc, G)</li> <li>• <b>Black oats</b> (E,S,G)</li> <li>• <b>Annual ryegrass</b> (E, S, G)</li> <li>• <b>Winter wheat</b> (S, E,G)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Radish</b> (S, G, Nsc, Psc)</li> <li>• <b>Turnip</b> (S, G, Nsc,Psc)</li> <li>• <b>Kale</b> (S,E, G)</li> <li>• <b>Winter canola</b> (S,E,G)</li> <li>• <b>Rape</b> (S,E,G)</li> <li>• <b>Winter camelina</b> (S,E,P)</li> <li>• <b>Mustards</b> (S,E)</li> <li>• <b>Ethiopian cabbage</b> (S,E)</li> <li>• <b>Field Pennycress</b> (S,E,P)</li> <li>• <b>Crambe</b> (S,E,P)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Forage pea</b>(E, G)</li> <li>• <b>Winter Austrian peas</b> (E,G)</li> <li>• <b>Hairy vetch</b> (E, G,P)</li> <li>• <b>Crimson clover</b> (E,G,P)</li> <li>• <b>Red clover</b> (E,G,P)</li> <li>• <b>White clover</b> (E,G)</li> <li>• <b>Sweetclover</b> (S, E,G,P)</li> <li>• <b>Balansa clover</b> (E,G,P)</li> <li>• <b>Chickling vetch</b> (E,G)</li> <li>• <b>Faba bean</b> (E,G,P)</li> <li>• <b>Lentil</b> (E,G)</li> <li>• <b>Lupin</b> (S, P)</li> <li>• <b>Alfalfa</b> (S, Nsc)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Flax</b> (Psc,P)</li> <li>• <b>Plantain</b></li> <li>• <b>Chicory</b></li> </ul>

## WARM-SEASON COVER CROPS/ SUMMER PLANTING/PREVENTED PLANTING

Cereals/grasses	Legumes (Nfix)	Others
<ul style="list-style-type: none"> <li>• <b>Forage sorghum</b> (S,E,G,M)</li> <li>• <b>Sudangrass</b> (S, E,G,M)</li> <li>• <b>Sorghum x sudan</b> (S,E,G,M)</li> <li>• <b>Foxtail millet (German and Siberian)</b>(S, E,G,M)</li> <li>• <b>Japanese millet</b> (E,G,M)</li> <li>• <b>Pearl millet</b>(E,G,M)</li> <li>• <b>Proso millet</b>(E,G,M)</li> <li>• <b>Teff</b> (E,G,M)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Cowpea</b> (G)</li> <li>• <b>Soybean</b> (G)</li> <li>• <b>Mung bean</b></li> <li>• <b>Adzuki bean</b></li> <li>• <b>Sunnhemp</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Amaranth</b> (P, M)</li> <li>• <b>Buckwheat</b> (P, Psc)</li> <li>• <b>Phacelia</b> (Nsc, P)</li> <li>• <b>Sunflower</b> (P, Nsc)</li> <li>• <b>Safflower</b> (P)</li> <li>• <b>Okra</b></li> </ul>

### Mixtures: Choose cover crops with different benefits.

**Mix 1** soil builder (S) + N source (Nfix)/N scavenger (Nsc) + erosion preventer (E) + others

**Mix 2:** non-legume broadleaf + legume +cereal

**Mix 3:** Warm- and cool-seasons (before August 15)

**Mix 4:** For grazing include 5 or more species from different groups

Other ecosystem services: Grazing =G, Wildlife=W, Pollinators=P, Moisture = M, P scavengers= Psc

**PLAN AHEAD**  
**PURCHASE QUALITY SEED FROM A KNOWN SOURCE**