Introduction to cover crop selection

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How do I know what to use?
What are cover crops?

- A tool to address specific resource concerns.
- Not the “silver bullet”
- Can be annuals, biennials or perennials.
- Greater the diversity the greater the response from soil microbes and higher environmental stress tolerance.
What do I want to use cover crops for?

- Provide crop diversity
- Provide soil surface armor
- Build soil aggregates
- Improve water cycle
- Integrated pest management
- Build soil organic matter
- Promote nutrient cycling
- Encourage pollinators
- Adjust carbon : nitrogen ratios
- Provide food and shelter for wildlife
- Integrate livestock
Resource concerns
Major Crop Types

• Cool season grasses – small grains, annual ryegrass
• Cool season broadleaves – clovers, field peas, vetch, brassicas
• Warm season grasses – sorghums, sudangrass, millets, corn
• Warm season broadleaves – Cowpea, sunflower, buckwheat, soybean
Cool season grasses

• Fiberous root systems
• Mid to hi range C:N ratio, slower release of N
• Can be made into hay or haylage – typically at boot
Cereal or Winter Rye

- Hardest of cereals
- Can plant up to Nov. 1
- Matures rapidly in spring
- Must have termination plan
- Low fall yield
- Overwinters well
Annual or Italian Ryegrass

- Some shade tolerance
- Can utilize hi N levels
- Excellent forage
- Typically frost terminated in MN.
Oats

- Can be planted throughout growing season
- Best for fall tonnage
- Plant before Sept. 10
- Excellent forage
- Winter kills
- Commonly planted with brassicas for fall grazing
Barley

- Spring or fall seeding
- Cannot take wet areas
- Plant mid-July to late August for fall grazing.
- Very palatable.
Wheat

• Most useful in “succotash”
• Great in crop rotation
• Prefers heavier soils
• Plant mid-July to Oct. 1 as fall cover
Triticale

• Wheat x rye hybrid
• Excellent feed quality
• Spring or fall
• Winter variety may not overwinter in MN.
• Has allopathic affect on corn
• Commonly mixed with hairy vetch, crimson clover, annual ryegrass, brassicas and lentils.
• Plant mid-July to mid-October as fall cover.
Cool season broadleaves

• Can be planted in spring and fall blends
• Some are legumes, some not.
• Low C:N ratio = Rapid decomposition and rapid release of nitrogen.
• Brassicas do not have AMF associations
• High CP values
• Most highly digestible
Field Peas

• Excellent CP source
• Excellent N fixers (Inoculate)
• Likes cool weather
• Typically planted with small grains
• Can add brassicas for diversity
• Pollinator habitat
Vetches

- Hairy and Common
- Typically planted with rye
- Have termination plan for Hairy
- Excellent N fixers (legume)
- Common often winter kills
- 10% hairy “hard seeded”
- Can provide pollinator habitat
Lentils

- Winter kills
- N fixer (legume)
- Blend with small grains and brassicas for fall cover
Clovers

• Crimson, Berseem, Red
• N fixers (legume)
• Spring or fall plantings
• Crimson and Berseem will winter kill
• Some “hard seeded”
• Red not shade tolerant
Diakon radish

- Large bulb
- Excellent scavenger
- Decomposes quickly in spring
- 40% of bulb above ground
- Not preferred forage
- Suppresses nematodes
Purple Top Turnips

- Hi number seeds/pound
- Good late season feed
- Cattle prefer after freeze
- Readily available
- Works well in blends
- Winter kills
Appin forage turnip

- High leave to bulb ratio
- Quick maturity
- Regrows when grazed
Kale

• Cold tolerant
• Multi-cut
• Needs longer season than other brassicas for growth (plant in spring)
Rape Seed

- Cold hardy
- For sheep and cattle
- For summer or fall forage
Hybrid Brassicas

- Bred as forages
- Multi-cut
- Hi seed count/pound
- Winfred most cold tolerant
- T-Raptor and Pasja – summer brassicas
- Also Hunter, Vivant and Barkant
Phacelia

- Fiberous root
- Pollinator habitat
- Blossoms hold into late fall.
- Need very little in blends
- Lo C:N ratio
Warm season grasses

• All need at least 60º F soil temperature for germination.
• Do not handle frost
• Handle heat and drought well
• Most have substantially lower nutrient and water requirements than corn.
• Generally high C:N ratio – slow N release
Pearl Millet

• Similar to sorghum x sudan
• Multi-cut
• No prussic acid
• Handles sandy and acid soils
German Millet

- Fine stemmed
- Leafy
- Single cut
- Drought tolerant
- Can be used for hay
Japanese Millet

- Fine stems, wide leaves
- Multi-cut
- Handles wet sites
- Can be used for hay
- Requires more N than other millets
Siberian Millet

- Quickest growth
- Drought tolerant
- Most hardy millet
- Can be cut for hay
Sudangrass

- Available in BMR
- Multi-cut
- Preforms on sandy, acidic, low fertility soils
- Suppresses nematodes
Forage sorghum

- Single cut
- Available in BMR
- Hi energy feed
- Reduces soil phosphorus loads
Sorghum x sudan

- Available in BMR
- Multi-cut
- Productive on marginal lands
- Reduces soil phosphorus loads

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Teffgrass

- Multi-cut
- Good for hay
- 1.3 million seeds/pound
- Must plant shallow in firm seed bed
- Difficult to use in blends
Grazing or Haylage Corn

- BMR = High energy
- Generally use 1 -2 #’s in blends
- Can use hybrids or OP in blends
Warm season broadleaves

• Some are legumes, some not
• Variable C:N ratio
Buckwheat

- Quick growth
- Pollinator habitat
- Plant June 5 – August 15
- Can reseed itself.
- Handles low fertility soils
- Lo C:N ratio
Sunflower

- 1-2 #'s/acre in blends
- Strong taproot
- Hi C:N ratio
- Pollinator habitat
- Use long day to avoid seed production
- Typically plant after mid-June in blends
Cowpea

• Legume
• Often planted with millets, sudangrass and sorghum x sudan.
• Need 65°F soil temperature for germination
• Like hot and moist conditions
Soybean

- Legume
- Often planted with corn or sorghum blends
- Adds CD and tonnage to mixes.
- Needs 55°F soil temperatures for germination
Sunn hemp

• Legume
• Needs 70° F soil temperatures for germination
• Suppresses nematodes
• Drought tolerant
Other considerations

• Field cropping history
• General soil type
• Cover crop termination
  – Herbicide
  – Tillage
  – Grazing
  – Roller crimp
  – Mowing
  – Frost
Mandan USDA-ARS

Cover Crop Chart

GROWTH CYCLE
A = Annual
B = Biennial
P = Perennial

RELATIVE WATER USE
💧 = Low
💧💧 = Medium
💧💧💧 = High

PLANT ARCHITECTURE
𝒰 = Upright
𝒰𝒰 = Upright-Spreading
𝒰(choice) = Prostrate

Cool Season

Warm Season

---Grass---
A Barley
A Oat
A/P Ryegrass
A Wheat
A Cereal rye
A Triticale
A Annual fescue
A/P Mustard

---Grass---
A Pearl millet
A Foxtail millet
A Proso millet
A Amaranth
A Buckwheat
A Proso millet
A Annual fescue
A Mustang

---Broadleaf---
A Phacelia
A Flax
A Spinach
A Turnip
A Field pea
A Berseem clover
A/P Medic
A Chickpea
A Sunflower
A Sudan grass

---Legumes---
A Radish
A Lentil
A B/P Red clover
A/P Birdsfoot trefoil
A Cowpea
A Safflower
A Teff

A Kale
A A/B Beet
A Lupin
A White clover
A Sainfoin
A Soybean
A Squash
A Grain sorghum

A A/B Carrot
A A/B Vetch
A A/B Sweetclover
A Alfalfa
A Mung bean
A Chicory
A Corn

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Additional Information
Resources

• Green Cover Seed

https://smartmix.greencoverseed.com/