Cereal Ryegrass

Use:

- Great “Foot in the door” cover crop
- Most widely used cover crop in the country
- Soil and water erosion control
- Forage
- Fights soil compaction

Pros:

- Can be planted after a late harvested cash crop (Can be planted into mid november in Southern IN)
- Deep root system
- Mines deep into soil profile for nutrients
- Helps improve water holding capacity in the soil
- Leaves a thick layer of residue on the soil surface
- Inexpensive seed cost per acre
- Fibrous roots (breaks up soil compaction)
- Low germination temperature (34°)
- Best crop at retaining residual Nitrogen (Scavenges up to 25 to 50 pounds N per year)
- Vigorous spring growth helps in weed suppression
- As cover crop dies it releases allelopathic chemicals to suppress small grass and broadleaf seeds for up to 1 month after termination
- Out yield other cereals when planted in droughty, infertile, and sandy soils
- Great harbor for beneficial insects (lady beetle)
- Helps remove excess water in the spring (as long as it is alive)
- Residue lowers soil temperature in the summer and helps retain water in warmer months

Cons:

- Can tie up residual nitrogen for next years cash crop when the cover crop gets too tall
- Large amount of residue (6 to 8 feet tall) (this is bad only when you don't know how to manage residue)

Termination:

- Chemicals (best time 12 to 18 inches tall), although fairly easy to kill no matter growth stage
- Roller crimper (boot stage or later)
- When Cereal Rye is taller than 18 inches; should Roller Crimper or other device to get it to lay down to make a mulch layer. If left standing it can shade out the cash crop early in season
- Mowing (boot stage or later); be careful not to cause clumps and areas with no residue

Planting Information:

- **Depth:** ¾ to 2 inches
- **Rate:** 46 to 140 pounds (Pure Live Seed)
- **Minimum germination temperature:** 34°
- **Drilled seeding rate:** 46 to 120 pounds (can go lower if using corn planter)
- **Broadcasting seeding rates:** 60 to 140 pounds

Information from: SARE *Managing Cover Crops Profitably*, Green Cover Seeds, and Indiana NRCS Crop Seeding Calculator

Oats

Use:

- Weed Suppression
- Forage for livestock
- Holds the soil in place
- Scavenges excess nutrients
- Adds biomass
- Nurse crop

Pros:

- Low cost cover crop that winter kills typically in a Zone 6 or colder (Great cover crop for beginners)
- Survives best in cool moist conditions on on well drained soils
- With a good stand and timely planting you can expect 2,000 to 4,000#/A of dry biomass
- Great scavenger of excess N-P-K (Studies have shown when planted in late summer can scavenge up to 70 pounds of Nitrogen per acre in the midwest)
- Quick germination make it a great smother crop
- Great nurse crop for legumes like hairy vetch, clovers, and winter pea
- Provides options for spring green manure or a companion crop
- Black oats tend to be more winter hardy than traditional Spring white oats

Cons:

- Least winter hardy and drought resistant of all small grain species
- Produce fewer tillers (More seed is needed to obtain adequate groundcover)
- Does not assist in breaking up compaction
- Overgrazing can deplete stand

Termination:

- Will winter kill in Indiana
- Mow or spray after milk or dough stage
- Rolling/crimping at dough stage or later

Planting Information:

- **Planting time:** August - September or March - May
  * Allow for 6 to 10 weeks of cool season growth if wanting forage or biomass
- **Depth:** ½ to 1 ½ inches deep
- **Rate:** 53 to 140 pounds (Pure Live Seed)
- **Minimum germination temperature:** 38°
- **Drilled seeding rate:** 53 to 110 pounds
- **Broadcasting seeding rates:** 70 to 140 pounds

Information from: SARE *Managing Cover Crops Profitably*, Green Cover Seeds, and Indiana NRCS Crop Seeding Calculator

Annual Ryegrass

Use:

- Cover Crops
- Great source for grazing (very high sugar content)

Pros:

- Produces a high amount of forage in a short amount of time
- Can tolerate multiple grazings
- Mixes well in diverse cover crop mixes (Clover and Vetch)
- Popular for interseeding into cash crops
    - Goes dormant above 85° (When cash crops are growing)
    - Germinates well on top of the soil
    - Shade tolerant
- Performs well in cool damp soils
- Annual Ryegrass tolerates wetter soils than Cereal Rye
- Deeper roots than Cereal Rye
- Mines minerals deep in the soil profile
- Great nitrogen scavenger
- Attracts few pest insects
- Provides residue on the soil surface
- Provides weed suppression

Cons:

- Hard to kill due to small narrow stem and leaf; and deep roots
- Must be established before freezing temperatures to survive
- Shows tolerance to glyphosate when not applied at proper times
- Top ten most herbicide resistant crops in the country
- Weed seed issue when seed quality small grain is desired within 2 growing periods

Termination:

- Herbicides only; make sure Annual Ryegrass is actively growing when applying herbicides
- Publication on effective Annual Ryegrass Termination:
    Annual Ryegrass as a Cover Crop, Management Considerations
    https://ryegrass.com/publications/ryegrass-management-recommendations.pdf

Planting Information:

- Two types of Annual Rye
    - Diploids: More winter hardy BUT establishes slower
    - Tetraploids: Less winter hardy BUT establishes quicker
- **Depth:** ¼ to ½
- **Rate:** 15 to 30 pounds (Pure Live Seed)
- **Minimum germination temperature:** 40°
- **Drilled seeding rate:** 15 to 20 pounds
- **Broadcasting seeding rates:** 20 to 30 pounds

Information from: SARE *Managing Cover Crops Profitably*, Green Cover Seeds, and Indiana NRCS Crop Seeding Calculator

Crimson Clover

Use:

- Large biomass and nitrogen producing legume cover crop
- Fall growth is enough to reduce soil erosion when planted early enough
- Deep taproot allows plant to scavenge excess Nitrogen in the soil profile
- Can be used as a hay or grazing forage

Pros:

- Produces large amounts of biomass
- Capable of growing at lower temperatures than other clovers (gives them ability to be planted later in the growing season)
- Grows great in a cover crop mix
- Fits well into a corn soybean rotation
- Helps inhibit the germination of small seeded weed species
- When killed creates a thick mulch on soil surface
- When allowed to bloom a great pollinator and host for beneficial insects such as lady beetles and pirate bugs

Cons:

- Susceptible to winter kill in colder regions
- When crimson clover winter kills it releases Nitrogen before future cash crop needs it
- Has the potential to attract voles due to its tap root size
- When grazed as a monoculture bloat can become an issue
- Alternative host for corn earworm

Termination:

- Chemical termination using a mixture including 2,4-D will kill a monoculture crop of Crimson Clover; Glyphosate by itself is not recommended to terminate Crimson Clover
- Make sure Crimson Clover has completely broken dormancy and is actively growing prior to spraying a herbicide mixture to terminate it.
- Roll and crimp when crop is in full flower; although rolling and crimping without a herbicide might not completely kill Crimson Clover
- A combination of chemical termination along with a roller crimper will lead to best success and will leave a thick mulch layer to protect the soil

Planting Information:

- **Depth:** ¼ - ½ inch
- **Rate:** 10 – 30 lbs/acre (Pure Live Seed)
- **Minimum germination temperature:** 42 degrees
- **Drilled seeding rate:** 10 – 20 pounds
- **Broadcasting seeding rates:** 15 – 30 pounds

Information from: SARE *Managing Cover Crops Profitably*, Green Cover Seeds, and Indiana NRCS Crop Seeding Calculator

Turnips

Use/Pros:

- Grazing livestock (High Sugar & Protein Content 20% to 25% Crude Protein)
- Extremely winter hardy
- Fast growing
- Nematode control
- Weed control
- Increasingly used as a winter cover crop for vegetables and specialty crop production
- Excellent at capturing residual nitrogen and putting it back in the soil
- Increases water infiltration by opening pore space
- Increased root penetration by next cash crop
- Acts as "natural tillage"

Cons:

- Glucosinolates (can cause thyroid enlargement if grazed too long in ruminants)
    - This is an issue in more mature forage (90 plus days old) and monocultures of brassicas (turnip, radish, etc.)
- Don't graze during breeding season or after plants flower
- Grazing immature plants by ruminates can cause nitrogen toxicity
- Do not like extremely wet soils
- Gives off a sulfur/methane smell when turnips decompose

Termination:

- A harsh winter will winterkill this crop
- Herbicides will terminate turnip; refer to a Certified Crop Advisor for recommendations
- Roller crimpers will not terminate turnips

Planting information:

- Depth: Optimum 1/4 "; Maximum 1/2"
- Minimum germination temperature: 42° to 50° Minimum soil temp
- Drilled seeding rates: 3 pounds per acre
- Broadcasting seeding rates: 4 pounds per acre
- Recommended seeding time: 1st August – Mid September
  (Can plant through the end of September in Southern Indiana)

Source Credits:

https://efotg.sc.egov.usda.gov/references/public/IN/Indiana_Seeding_Tool_Seeding_Guidelines.pdf
https://greencover.com/woo-seed/1064/
https://www.sare.org/publications/building-soils-for-better-crops/cover-crops-2/types-of-cover-crops/
https://hort.purdue.edu/newcrop/afcm/turnip.html
https://efotg.sc.egov.usda.gov/references/public/IN/Indiana_Seeding_Tool_Seeding_Guidelines.pdf

Radishes (cover crop specific varieties)

Use/Pros:

- Large tap root
- Fast Growing
- Scavenges residual nutrients
- Helps break up plow layers
- Excellent to use with manure applications when wanting to hold nitrogen for next cash crop
- Helps in spring weed control
- Tap root increases water infiltration
- Controls soil Nematodes
- Increased root penetration by next cash crop
- Acts as "natural tillage"

Cons:

- Can carry disease if the next cash crop is a brassica
- Gives off a sulfur/methane smell when radish decompose

To keep in mind:

- For NRCS or SWCD programs, cannot be a monoculture of radish (maximum allowed is 60% radish according to Indiana NRCS Cover Crop Seeding Calculator)

Termination:

- A harsh winter will winterkill this crop
- Herbicides will terminate radish; refer to a Certified Crop Advisor for recommendations
- Roller crimpers will not terminate radish

Planting information:

- Depth: ¼" - ½" Deep
- Minimum germination temperature: 45°
- Drilled seeding rates: 4 pounds per acre (@ 60% of mix)
- Broadcasting seeding rates: 4 pounds per acre (@ 60% of mix)
- Recommended seeding time: 1st August – Mid September
  (Can plant through the end of September in Southern Indiana)

Source Credits:

https://greencover.com/woo-seed/1060/
https://www.sare.org/publications/building-soils-for-better-crops/cover-crops-2/types-of-cover-crops/
https://ag.purdue.edu/btny/ppdl/Pages/POTW2017/POTW01302017.aspx
https://efotg.sc.egov.usda.gov/references/public/IN/Indiana_Seeding_Tool_Seeding_Guidelines.pdf