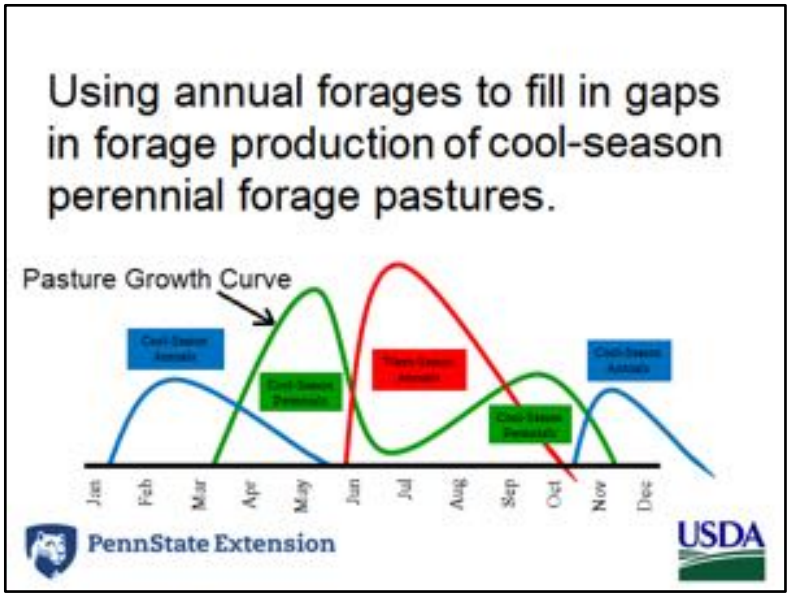
Session 4 – Getting the Most out of Winter Grazing by Forage Species Selection/Management and Grazing Management

Jessica Williamson was also moderator of Session 4 and its first speaker as with Session 1. Amanda Grev was the session leader that organized this session and arranged to have 3 speakers for it. Amanda, however, being the pasture specialist for Maryland Extension had Maryland grazing conferences that were scheduled as a long standing commitment the same week as our Conference, so she had to bow out as session 4 moderator.

Jessica Williamson presented "Interseeding Forages into Corn to Extend the Grazing Season". Kathy Soder, USDA-ARS Animal Scientist, co-authored the presentation with Jessica. Grazing annual forages bridges the "gap" in cool season perennial pasture production during mid-summer and in late fall and early spring in the Northeast and reduce stored and harvested feed needs and costs associated with filling those gaps that occur when perennial pastures are dormant. The diagram below illustrates where these gaps occur and how annual forages can fill those gaps.



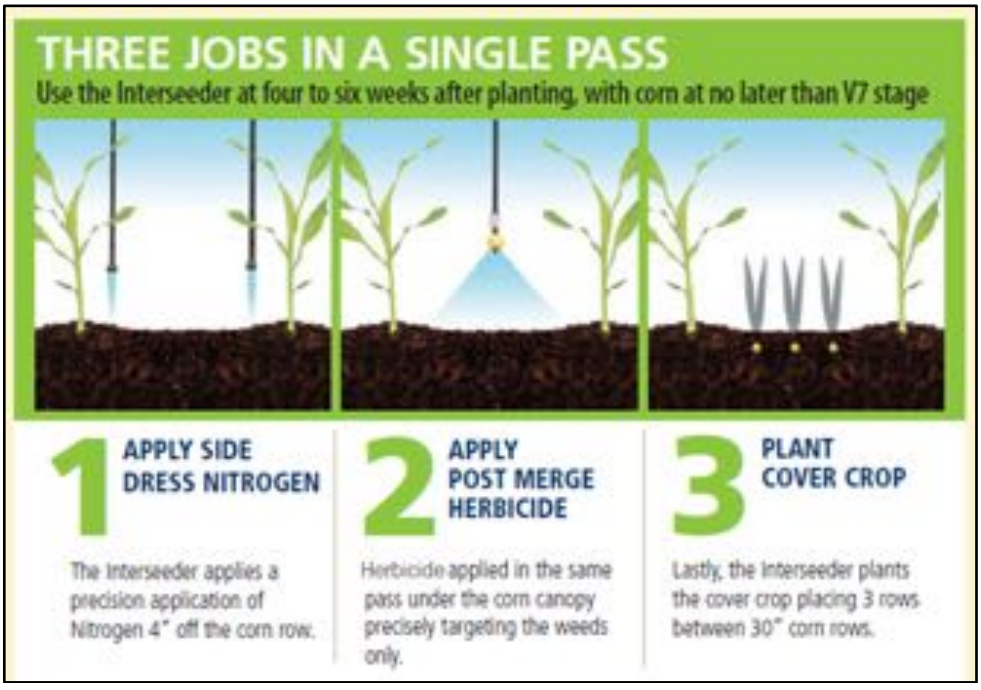
The pasture growth curve is the green line showing the peaks and valleys of forage growth on perennial cool-season grass pastures in the southeastern portion of the Northeast. Hardy cool season annual forages growth curves are depicted by the blue lines that precede the pasture growth curve or peak in late fall – early winter after cool-season perennial forage pastures go into winter dormancy. The red line is the warm-season annuals growth curve. These forages are planted in May and peak in growth by July, and if grazed to allow regrowth, may furnish grazable forage until mid-October unless an early killing frost occurs.

To get a cool-season annual forage off to a good start in a corn field, an interseeder has been developed that prepares a good seedbed for the annual forage/cover crop and sows it between rows of corn. A picture of it is shown below. The procedure for doing this involves these steps:

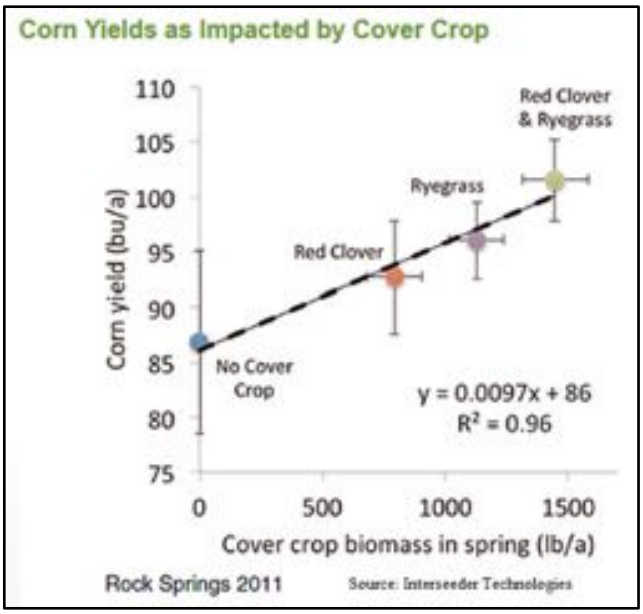
1. Plant corn as usual.
    - Can harvest as grain or silage
2. When corn reaches V4-V7 stage, drill in interseeded forages.
    - No more than 18" tall
3. Forages grow slowly under the canopy of the corn.

4. When corn is removed, forages "take off" in growth, because they already germinated and have developed a root system and some leaf area.

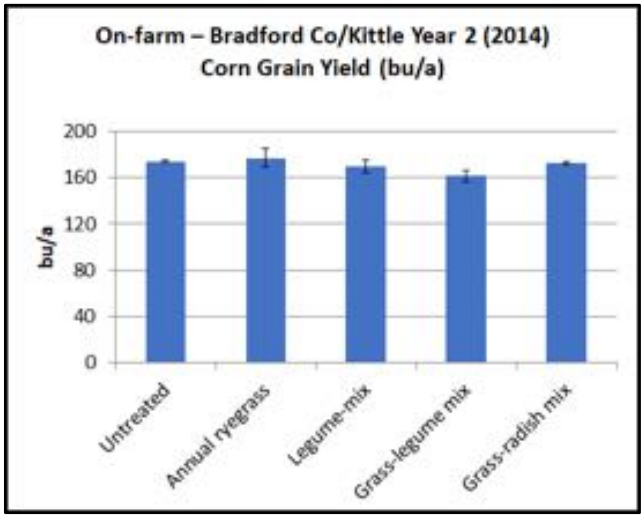
Interseeder used to seed a cover crop between rows of corn.



A research trial done in 2011 at the Rock Springs Experiment Farm near University Park, PA looked at corn yield differences from a control of no cover crop and 3 incorporated cover crops - sowed red clover alone, ryegrass alone, and a red clover and ryegrass binary mixture into a growing corn crop using the interseeder. Corn yields that year were all depressed in the trial probably due a drier and hotter July than usual. However, the more biomass incorporated into the soil, the higher the corn yield was.



The graph to the left shows a straight line increase in corn yield as more cover crop biomass is incorporated into the soil before corn planting in the spring. Red clover does not produce as much biomass as ryegrass as it is slower to grow in the spring previous to corn planting. The combination of red clover and ryegrass produced the most cover crop biomass and the highest corn yield. These cover crop treatments were not grazed. If a corn crop had been raised on the same trial plot the previous year, the residual nitrogen leftover from growing that corn crop would have benefited the ryegrass and as it decayed fed the residual nitrogen to the 2011 corn crop.

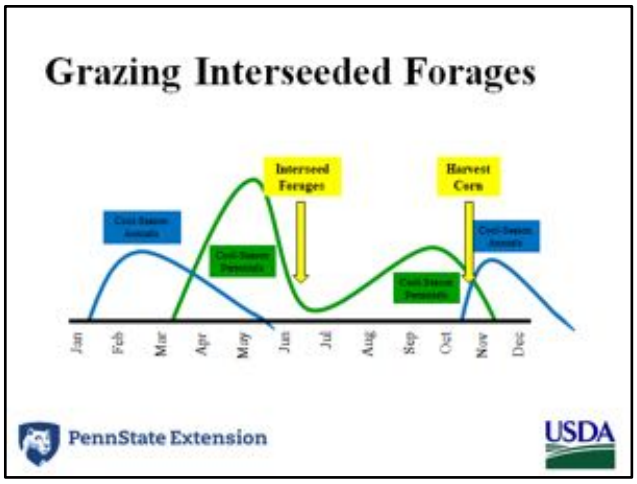


In this on-farm trial done in 2014, all treatments yield essentially the same, a few bushels over 160. This is good in that the use of cover crops did not interfere with the corn yield in any meaningful way if done to avoid depleting soil moisture while the cover crop is still live and growing prior to planting the corn. It also is probably better on cold soils in spring to incorporate cover crop biomass rather than leaving it on the soil surface, as the mulch will slow soil warming. This can hinder early corn growth and delay maturity.

For livestock farmers that have corn acreage that is used for grain and/or silage, inserting a cover crop into the growing corn can also be used as a forage crop, either grazed or harvested for silage. If grazed, the livestock need to have easy access to shelter if weather conditions are cold, windy, and wet. The hardier the livestock are, the better this system will work for grazing in late fall to early winter, provided that the cover crop planted grows enough after corn harvest to be grazable. Short maturity corn is likely to be better than a later maturing variety to get the cover

crop released from the corn overstory sooner so that it has more sunlight to grow enough for late fall-early winter grazing. Harvesting the corn as silage would be ideal to get the cover crop released even sooner. The cover crop also would give the soil protection from over winter soil erosion as corn stubble left after corn silage harvest leaves little soil cover. Ryegrass grazed in the fall does not regrow much the following spring prior to corn planting. The second year of the grazing trial, the researchers switched to cereal rye.

The diagram to the left shows the rough time to interseed a cool season cover crop into a standing corn crop. This will vary depending on when the corn reaches the V7 stage or 18 inches high. Stalk damage may occur if it is taller than 18 inches as the tool bar of the interseeder and tractor axles will be reached. This diagram also shows an approximate date for corn harvest. Ideally it would be best to move that back to corn silage harvest time to get more cover crop growth for late fall grazing.



Interseeded ryegrass cover crop in grain corn near harvest time. This is a nice grass stand with enough height to be grazed. Corn harvest will wheel track some of it down, but it depends how much is tracked down by the size of the cornhead used to harvest the corn. Weather conditions will greatly vary cover crop growth. Some years can limit cover crop progress by corn harvest time, such as drought or a late killing frost keeping corn canopy alive well into the fall.

The 2017 Integrating Grazing Livestock and Cropping Systems through Interseeded Forages trial used 102-day relative maturity corn at 26,000 seeds per acre. Ryegrass was interseeded at the rate of 25 pounds per acre when the corn was at V4-V5 stage. 60 dairy heifers, 10 per paddock, grazed the trial plots from December 11-21, 2017. Due to the lateness of grazing, there were some weather issues.

In 2018, the researchers planted cereal rye at 2 bushels of seed per acre instead of ryegrass. They also planted an earlier maturity corn variety (98-day). The cover crop was grazed earlier in the year, in mid-November instead of mid-December, using beef cows instead of dairy heifers. They also had the beef cows graze the cover crop in the spring of 2019 since the cereal rye produced

enough spring regrowth for grazing. The cereal rye grew quickly and graze-out required more grazing pressure than was done in the fall of 2018 to allow spring regrowth.

2017 Fall Forage Yield

- Total Forage Availability (Corn residue and ryegrass)
  - 4,950 lbs. DM/ac (100% utilization)
  - 3,300 lbs. DM/ac (65% utilization)
  - 2,475 lbs. DM/ac (50% utilization)
- Ryegrass Availability (NO corn stover)
  - 1,750 lbs. DM/ac (100% utilization)
  - 1,135 lbs. DM/ac (65% utilization)
  - 875 lbs. DM/ac (50% utilization)

Potential Extension of the Grazing Season in FALL (Corn residue and ryegrass)

- **65% utilization**
  - 132 day/AU/ac @ 2.5% BW consumption (3,300 lbs. DM/ac / 25 lbs./AU/day)
  - Example: A herd of 30 beef cows (~1200 lbs. each) could graze 73 days on 20 acres w/ 65% utilization
- **50% utilization**
  - 99 d/AU/ac @ 2.5% BW consumption
  - Example: A herd of 30 beef cows (~1200 lbs. each) could graze 55 days on 20 acres w/ 50% utilization

2018/2019 Extension of the Grazing Season

- Grazed Nov. 14 – Dec. 4 (20 days)
  - 24 cows @ ~1450 lbs.
  - 6 acres total
- Grazed April 29 – May 17 (20 days)
  - 16 cows @ ~1450 lbs.
  - 6 acres total

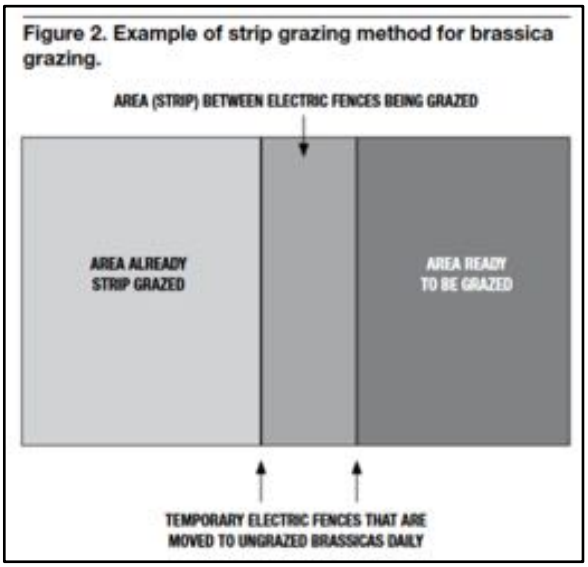


Figure 2. Example of strip grazing method for brassica grazing.

The diagram to the right shows how to strip graze an interseeded cover crop in a corn crop once the corn is harvested. It is done the same way brassicas are grazed, by strip grazing. Two temporary electric single wire fences move forward on a daily basis. The forward fence is moved ahead to open up a new area for grazing, while the back wire fence is used to keep the livestock from regrazing the area already grazed (Editor's Note: This allows the area already grazed to begin regrowth without further leaf area being removed or having its plant crown damaged by treading or grazing). Fifty percent utilization of the cover crop in the fall should be used to promote better spring regrowth. (Editor's note: Realistically, even with strip grazing corn stover, its utilization by cattle only approaches 50 percent. Cows will selectively graze the more palatable portions of the

plant first: (1) grain; (2) leaves and husks; (3) cobs and stalks [Farming Magazine on-line, 2016].) Graze out cereal rye cover crop in the last rotation cycle before corn planting in the spring.

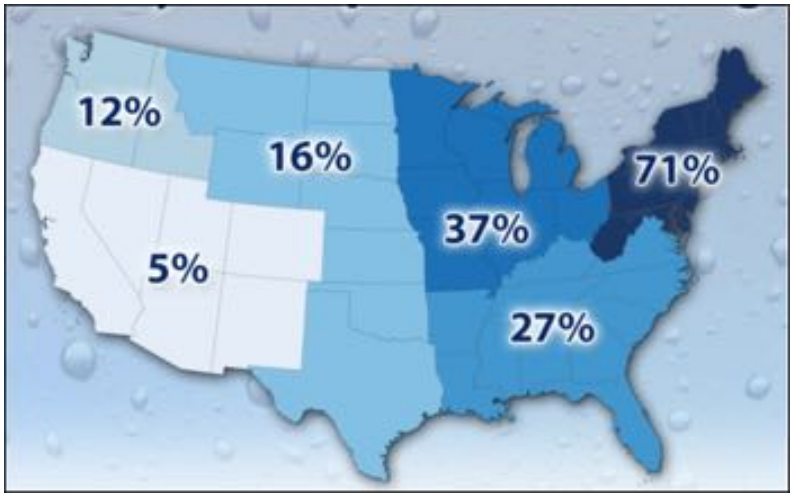
How will this fit on a livestock operation?

Things to consider:

- Permanent fence needed around crop fields to be grazed.
- Ability to remove livestock during bad weather easily.
- Animal and soil hazard (soil compaction issues)
- Additional fertilizer needed, or is residual nitrogen from corn adequate?
- Acreage to spread manure. Will grazing a cover cropped field upset manure spreading plans?
- Keeps animals out of confinement or sacrifice lot longer into the season.
- Great place for calving/lambing season
- High nutritive value of forage with adequate filler from the corn stover if corn harvested for grain, and
- Hardiness of livestock.

The second speaker of Session 4 was **Heather Darby**, Professor, UVM Extension, St. Albans, VT. Her topic was "Extending the Grazing Season in the Northeast". She started out her presentation posing the question, "Why consider annuals?". She then listed their strong points:

- Drought tolerant
- Cold (or heat – warm-season) tolerant
- Fill gaps in feed (summer slump in cool-season perennial pastures)
- High biomass crop
- Multipurpose
    - Grazing
    - Silage/balage
    - Grain/seed



Increase in the number of 2" rainfalls per year from 1958 to 2011

With the rise in incidences of heavy rainfall, growing cover crops can also aid in reducing soil erosion by water runoff rather than leaving cropfields fallow after harvesting a row crop.