Webinars

enhance

Resources for **DAIRYWOMEN**
without leaving the farm

Dairy Girl NETWORK

DairyGirlNetwork.com

PREPARING FOR THE PLANTING SEASON

Mycogen SEEDS

DOW Dow AgroSciences

Unmatched

JON ERICKSON

Mycogen SEEDS

Mycogen SEEDS

ASK HER

DOW Dow AgroSciences

Quality Corn Silage

High quality silage is better feed

This leads to healthier, happier cows that make more milk!

Growing and feeding high quality, HOME GROWN feed is more economical for the dairy!

Mycogen® SEEDS

GROWING HIGH QUALITY CORN SILAGE

- **A highly technological process:**
  - **Crop Production Decisions**
  - **Fertility**
  - **Disease and Insect Management**
  - **Weed Management**

Mycogen SEEDS

GROWING HIGH QUALITY CORN SILAGE

PRE-PLANT THOUGHTS

PLANTING SEASON

POST-PLANT EVALUATION

Mycogen SEEDS

PRE-PLANT: PLANNING

Mycogen SEEDS

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PLANNING INVOLVES:

Choosing hybrids – factors to consider

- **Your goals and capability as a dairy producer**

Choosing where to plant each hybrid

- **Where will they do best?**

Managing to protect the yield potential

- **Providing nutritional needs**
- **Protection from pests**

Mycogen SEEDS

NITROGEN

Available from 2 primary sources for corn

- **Through organic decomposition (manure & residue breakdown)**
  - Nitrogen, Phosphorous and Sulfur
    - Possible N immobilization

- **From added inorganic forms of N (fertilizers)**

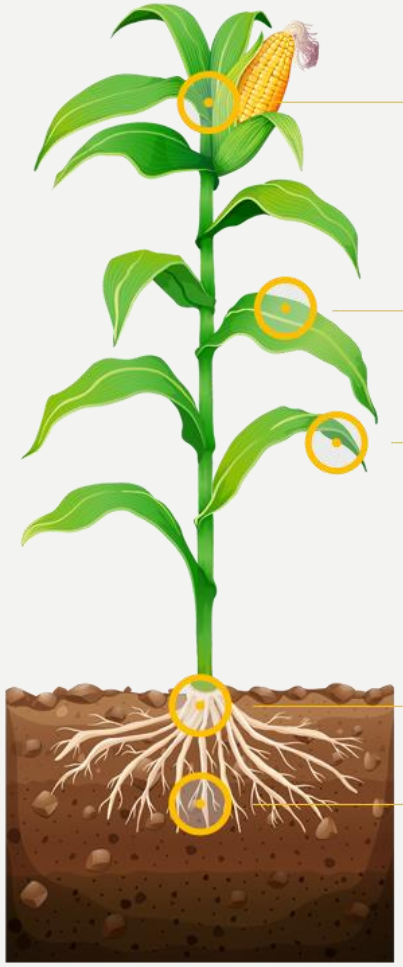
- **Silage corn requires 7.0 – 10 pounds of N per ton of yield**
  - **25 ton silage crop requires ~200# of total N**

PHOSPHORUS

Generally not an issue on being low in soils with dairy history.

However, important in nutrient management planning.

Early season P deficiency



The highest levels of P in young plants are found in tissue at the growing point. As crops mature, most P moves into the seeds, fruit, or both.

Under P deficiency, some crops, such as corn, tend to show abnormal discoloration

Phosphorus is noted especially for its role in capturing and converting the sun's energy into useful plant compounds

Phosphorus promotes root development and early seeding growth

Research associates specific growth factors with P, stimulated root development, increased stalk and stem strength, and improved flower formation and seed production

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KEY NUTRIENT: POTASSIUM

- ~ 7 pounds of K_2O is needed per ton of corn silage
- 25 Ton yield of corn silage requires 182 pounds of K_2O

Especially important to increased resistance to disease & lodging, stalk quality & standability.

SECONDARY NUTRIENTS

Calcium, Magnesium and Sulfur

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MICRONUTRIENTS

The micronutrients: Boron (B), Chlorine (Cl), Copper (Cu), Iron (Fe), Manganese (Mn), Molybdenum (Mo), Nickel (Ni) & Zinc (Zn)

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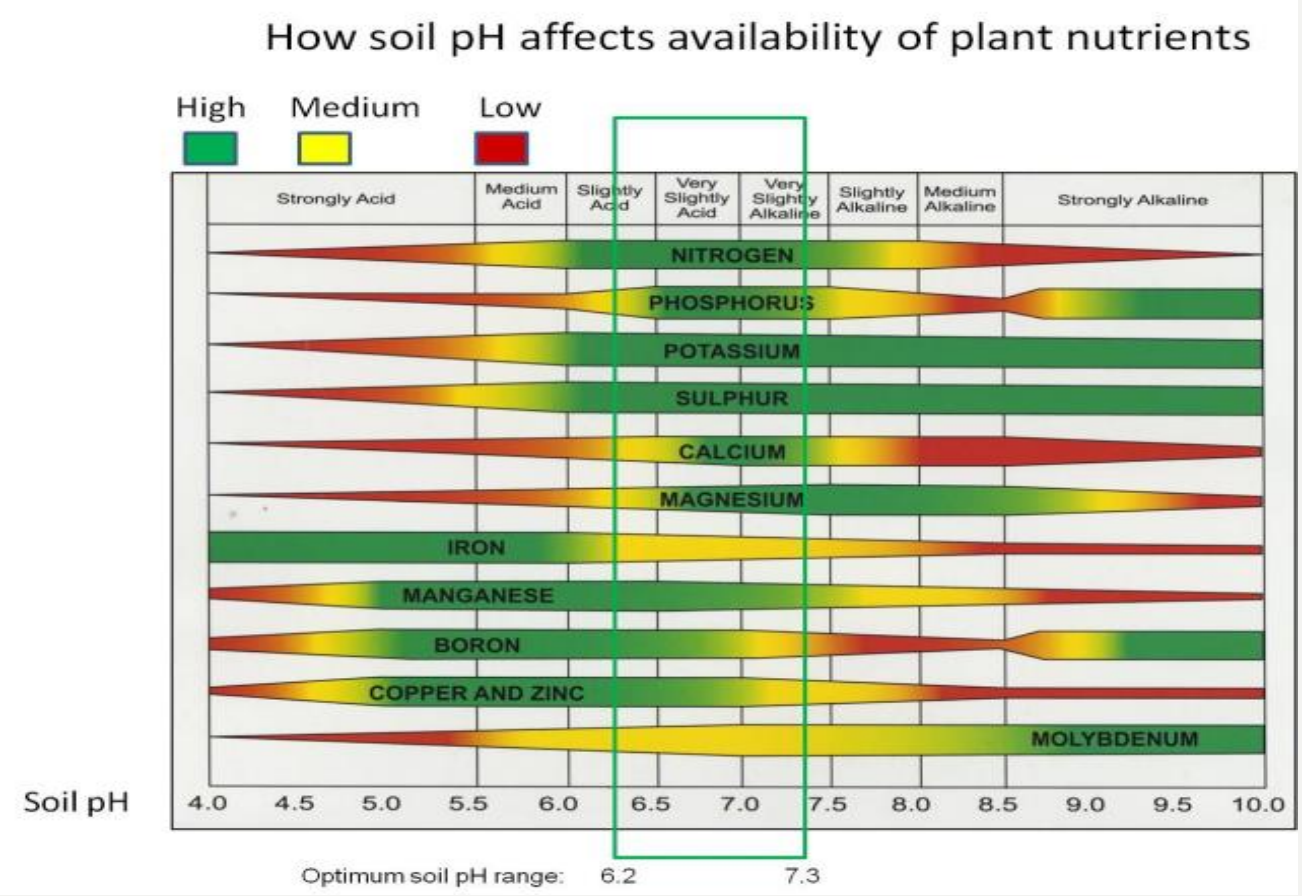
SOIL PH

A measure of acidity or alkalinity in soils.

- **For corn: optimum range is from 6.0 to 6.5**



HOW DO WE KNOW WHAT WE NEED?

The key to high yielding crop production is a sound fertility program; the key to a sound fertility program is a good soil testing program.

DAIRYLAND
Laboratories, Inc.

709 W Meadow St
Stratford, WI 54484
Telephone 715-687-9997
Fax: 715-687-9907
Email: soil@dairylandlabs.com

Lab No. 8S6483
State: WI
County: 3
Account: 693
Date Received: 2/28/2018
Date Processed: 2/28/2018

Submitted By:
Your Feed Dealership
Soil Account
132 Main St.
Your City, WI 54612

Grower:
ROD ELLWANGER
, W

Field: A
Acres: 20.0
Slope:
Soil Name Almena
Plow Depth: 6.5
Irrigated: N
Tiled: N

Laboratory Analysis

Sample No.	Text Code	Est CEC	Soil pH	O.M. %	P ppm	K ppm	Ca ppm	Mg ppm	B ppm	Mn ppm	Zn ppm	SO4-S ppm	Density	Buffer pH	60-69 Lime
1	2		5.5	3.0	25	90							1.08	5.9	12.0
2	2		5.8	3.2	28	98							0.84	6.3	12.0
3	2		6.3	3.1	35	107							1.05	6.8	2.8
4	2		6.8	3.2	42	128							0.99	N.R.	0.0
Adj. Avg:			6.1	3.1	29	98									

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ANOTHER VALUABLE TEST

Manure contains key nutrients for corn production.

ANALYSIS RESULTS

SAMPLE ID		ACTUAL ANALYSIS	
SAMPLE NAME:	manure	MOISTURE:	78.00%
MATERIAL:	Dairy	SOLIDS:	22.00%
STORAGE SYSTEM:	Liquid	NITROGEN:	0.20%
		PHOSPHORUS:	0.05%
		POTASSIUM:	0.10%

	Total Nutrients	Estimated 1st year Available Nutrients		
		Time to incorporation		
		>72 hours or not incorporated	1 to 72 hours	<1 hour or injected
	lbs/1000 gal	lbs/1000 gal		
NITROGEN	16.60	4.98	6.64	8.30
PHOSPHATE	9.50	7.60	7.60	7.60
POTASH	9.96	7.97	7.97	7.97
TOTAL VALUE		$7.13	$7.63	$8.13

PLANNING AND PREP: EQUIPMENT

The most important piece of equipment on the farm…

THE IMPORTANCE OF THE PLANTER

The Bottom Line is:

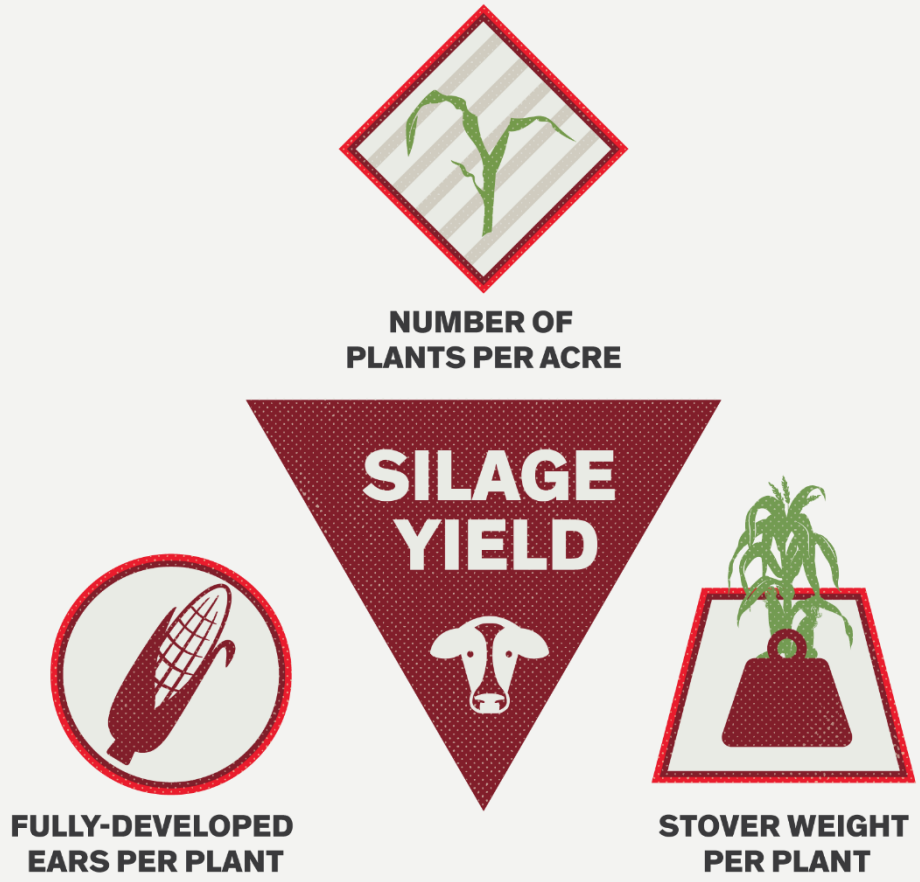
Uneven stand establishment in corn can reduce a field's yield potential from the first day you place seed in the ground.

Losses can easily be as much as 1 – 2 Ton corn silage per acre due to combinations of uneven within-row plant spacing or uneven seedling emergence.


387
387
Time to Plant My Feed
Mycogen
SEEDS

THE “SILAGE” CORN YIELD TRIANGLE

The highest yield potential is the day the seed goes in the ground



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THE MOST IMPORTANT TIME IN CROP PRODUCTION

Crop success or failure depends on your ability to control planting factors.

- **Planting fundamentals are always important!**
- **Factors to Consider**
  - **Seed sizes**
  - **Seed quality**
  - **Soil temperature**
  - **Planting speed**
  - **Planting depth**

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SEED SIZES AND SHAPES

The size or shape of the seed does not influence the plant's genetic yield potential.

- Corn seed size varies depending where it is formed on the ear. Larger seeds form at the base, where silking and pollination occur first. In general, seeds are smaller toward the tip of the ear.
- However, **variability in seed sizes can lead to multiple drops or skips.** To prevent such issues, consider adjustments specific to your type of planter and seed.

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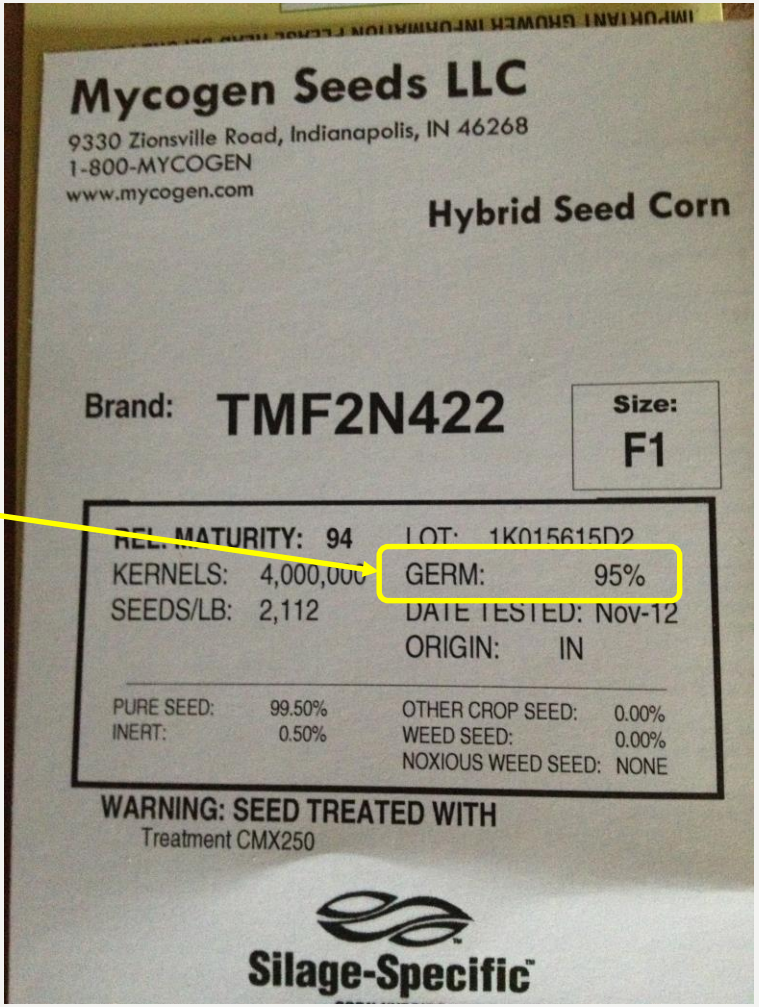
SEED QUALITY

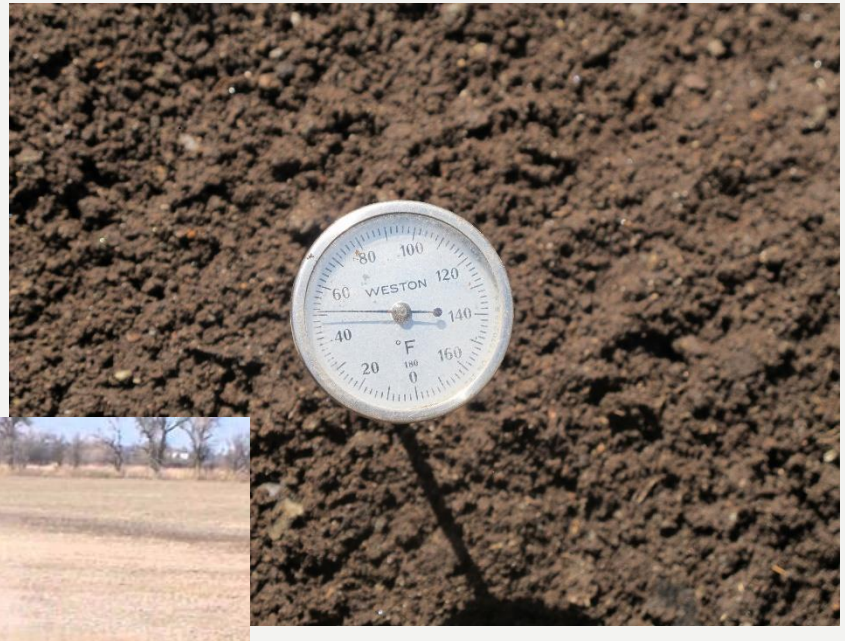
High seed quality is critical to obtaining a healthy, even stand. One way to assess seed quality is through germination testing.

- **All seed companies perform a standard germination test on each lot of seed.**
- **These results are on the tag.**
- **Expressed as a percentage, this value denotes the highest level of germination achieved by that lot of seed under optimum conditions.**



HOW DO WE KNOW WHEN ITS TIME TO PLANT?

- Soil Conditions
- Soil Temperature
- Calendar?



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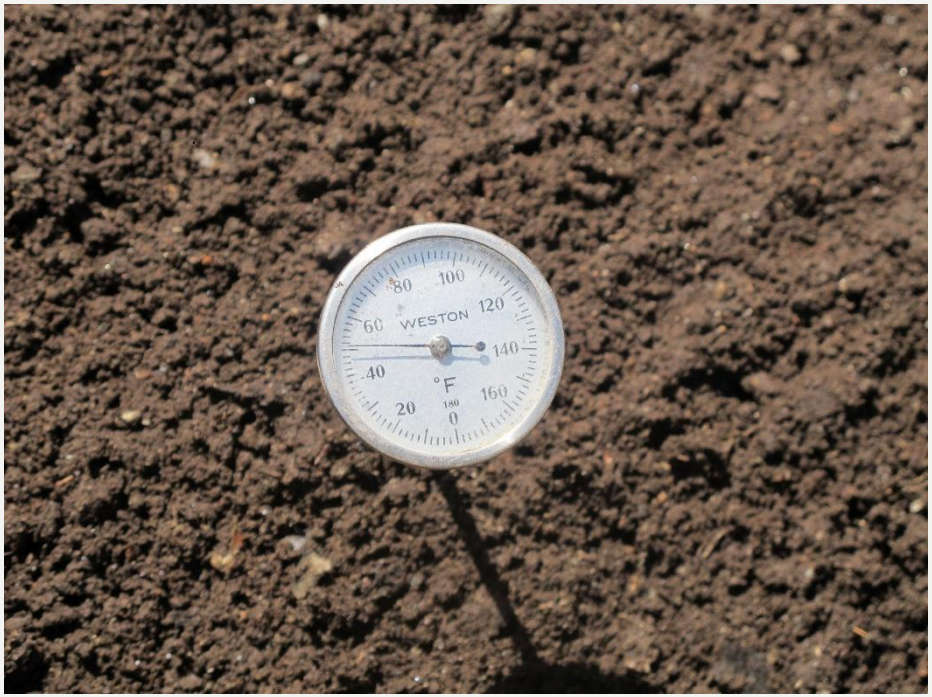
PLANTING TEMPERATURE

Soil temperatures cooler than 50° F are <u>not</u> suitable for planting.

- **Emergence will be delayed**
- **Cool, wet soils are environments for pathogens that contribute to seedling blights, such as gibberella, pythium, diplodia and penicillium.**



Mycogen SEEDS

WHAT ABOUT PLANTING SPEED?

Plant at the proper speed.

- **Planting speed has important implications for seed spacing and depth.**
- **Generally, 5.5 mph is a manageable planting speed.**

By Grain Central, 27 February 2017
New apps for managing machinery, selling grain and improving communications.
https://www.graincentral.com/cropping/whats-new-in-the-apps-world/

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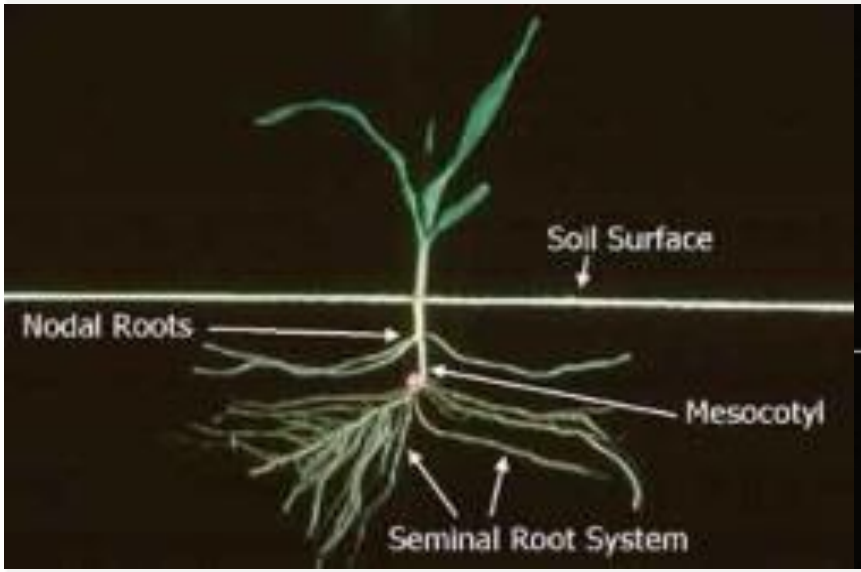
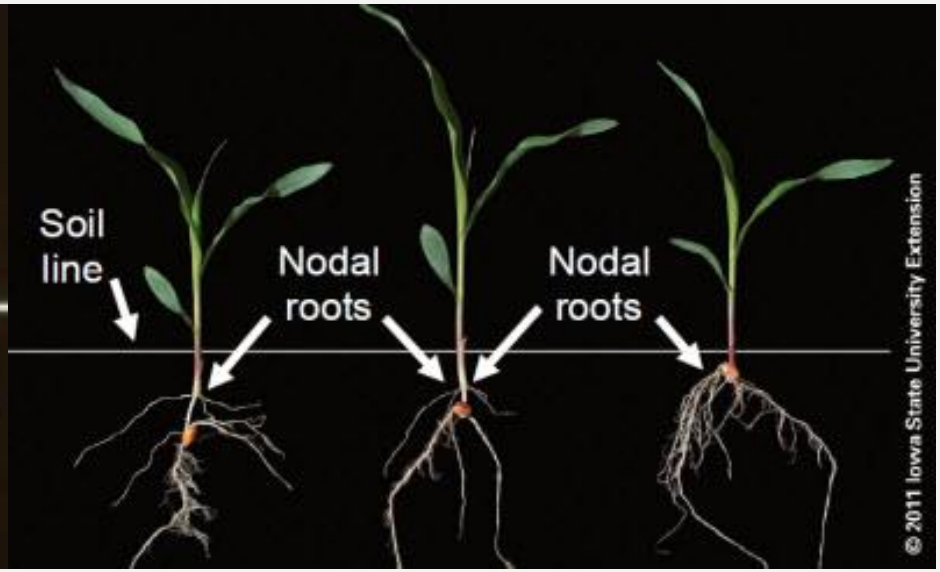
PLANTING DEPTH

For normal conditions *plant corn 1.5 to 2 inches deep* to provide frost protection and allow for adequate root development.

- **Shallower planting often results in poor root development and should be avoided in all tillage systems**





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DETERMINE THE CORRECT PLANTING DEPTH IN THE FIELD, DURING PLANTING

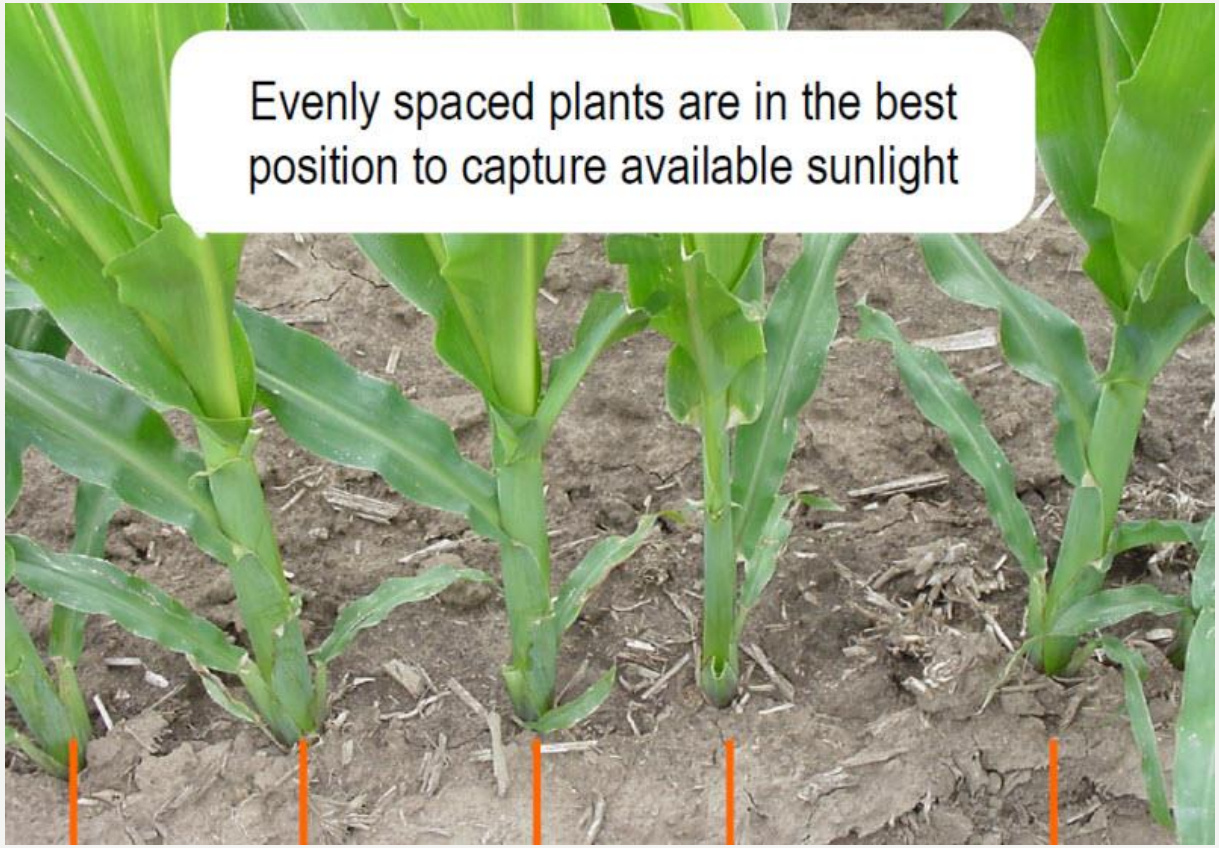
Check every day and every time you pull into a new field (actual depth will likely change as soil conditions change)

- **Base on current soil moisture conditions and the 5-10 day weather forecast**
- **Check the depth control settings on the planter…are they accurate??**

Mycogen SEEDS

WHILE YOU'RE DIGGING, CHECK FOR PLANT SPACING

The corn seed needs to be planted uniformly within the row to ensure maximum yields and optimal crop performance – regardless of plant population and planting date



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WHY IS SPACING IMPORTANT?

Within-row spacing:

Improvement could increase grain yield from 4 to 12 bu/acre, or .5 to 1.5 Ton of corn silage per acre!

PLANTING ISSUES LEAD TO REDUCED YIELD AND QUALITY

PLANTING

"You only get one chance to do this right."

Bruce Potter
IPM Specialist- SW Minnesota
University of Minnesota Extension

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NOW IT'S IN THE GROUND!

If you have a poor stand of corn it's almost never because of a bad lot of seed.

https://www.farmingmagazine.com/dairy/forages/understanding-forage-problems/

ASSESSING & SETTING EXPECTATIONS

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WHAT'S GOING ON UNDERGROUND?

Germination occurs 4-5 days after planting. The time will vary depending on the environment (soil temperature and moisture).

- **Water is absorbed by the kernel.**
- **The kernel must absorb up to 30% of its weight to initiate germination.**

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VE STAGE (VEGETATIVE EMERGENCE)

- Under warm, moist conditions, plant emergence will occur within 5 to 10 days after planting, under cool or dry conditions emergence may require 2 weeks or longer.
- Exposure to sunlight will cause the coleoptile to rupture and the first true leaves of the plumule to emerge. Mesocotyl and coleoptile elongation ceases.
- At the VE stage the seminal root system (radicle and 2-5 seminal roots) anchors the plant and is the main provider of nutrients and moisture.

EMERGENCE THOUGHTS

- **Number of days between plant emergence is not so important**
  - **Leaf stages between plants is very important**
  - **Plants should be within 1 leaf stage**
    - Plants more than 1 leaf stage behind will be poor productive plants
  - **90% of plants should have normal ear development**
    - barren plants are no better than weeds

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STAND QUALITY - EMERGENCE

- It's what sets the foundation for success!
- Ideal is that all plants emerge within 24 to 48 hours of each other

Uniform Emergence

=

Uniform Ears

1. A uniform stand sets the stage for everything else to come
2. Provides consistent growth, pollination, ear size and proven higher yields

- **How do we classify Uniform Emergence?**

EMERGENCE CONT.

1 - 2 leaf difference, may lead to reduced ear set

- ***3 or more leaf/collar difference between local plants = Competition = Weed***
  - **Reduced ear, reduced kernel set or no ear present**
  - **Reduced stalk size**

2 collar difference

Late emerging plant in center

1 plant per 1/1000th of an acre = 3 to 7 bu/ac of yield potential, or *0.5 - 1 ton per acre of corn silage!*

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HOW TO GAUGE CORN GROWTH

- **The leaf collar method**
  - **The collar is where the leaf blade visually breaks away from the sheath and the stalk of the corn plant,**
  - **The number of visible leaf collars is equal to vegetative growth stage (V stages).**
  - **Be sure to count only the leaves with visible collars**
  - **Leaves with collars still in the whorl are not counted when determining vegetative growth stage.**

A growth stage begins when at least 50% of the plants have reached or are beyond a certain stage. Growth stages may overlap in a field.

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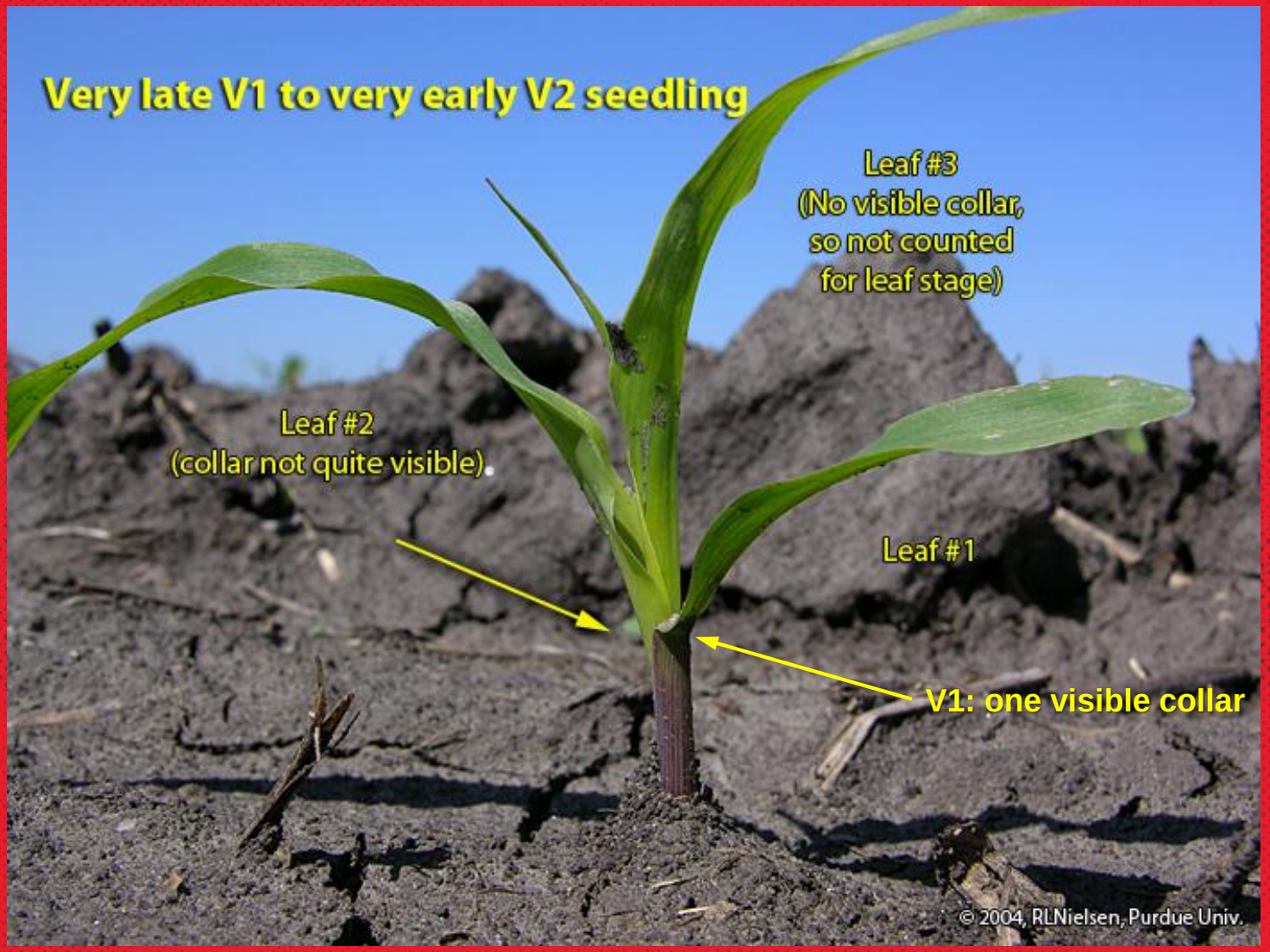
VE STAGE: VEGETATIVE EMERGENCE

EARLY STAGES

V1 is reached when the first leaf has fully emerged and collar is visible.

- **This stage occurs 3-4 days after emergence, approximately 190 GDD.**
- **The first leaf emerges with a rounded tip. All leaves after this will have a pointed tip.**



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EARLY STAGES

V3 Stage (Seed No Longer a Food Source)

- **Occurs 10-20 days after emergence at 315-370 GDD.**
- **Leaves begin photosynthesis, thereby replacing the seed as a food source.**
- **V3 is identified by 3 visible leaf collars.**
- **The growing point is still below the soil surface. Seminal root growth ceases while growth of the nodal root system increases.**
- **Water and nutrients are supplied jointly by the seminal roots and the nodal roots.**

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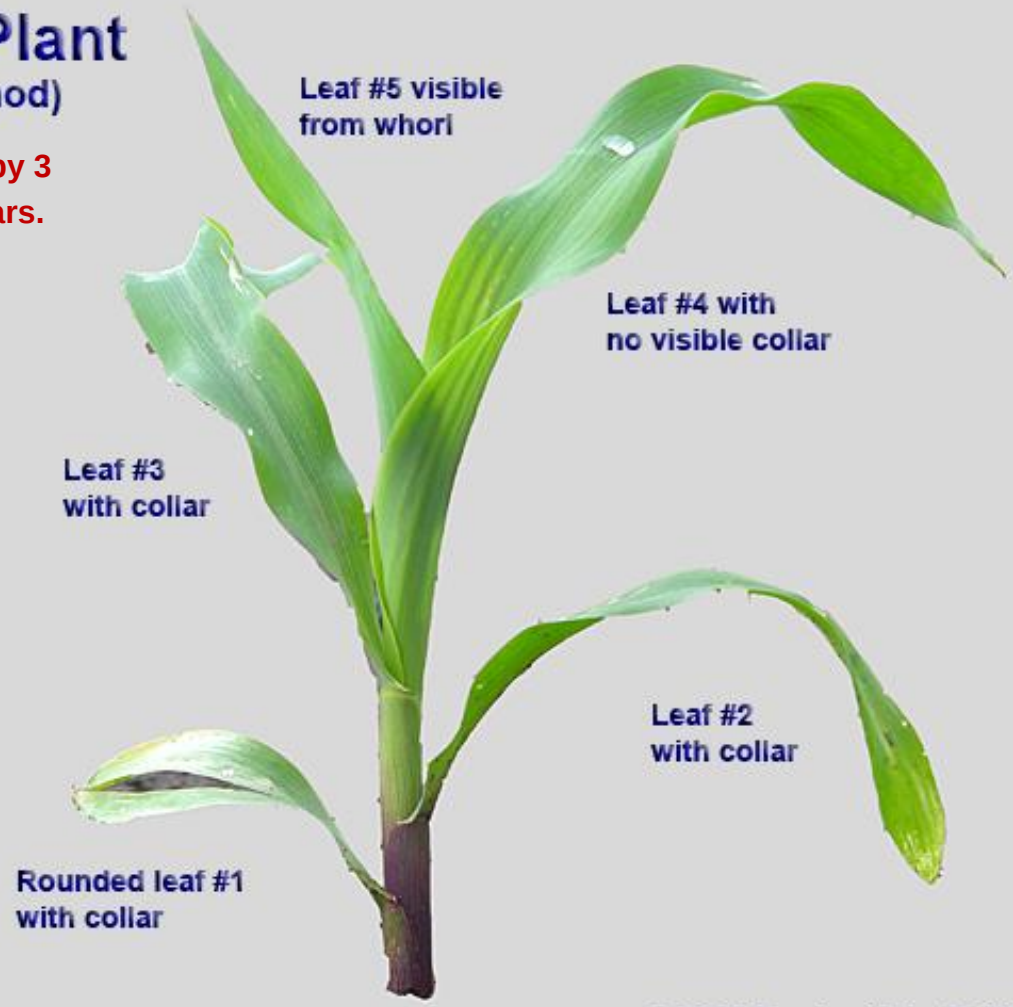
V3 Corn Plant

(leaf collar method)

V3 is identified by 3 visible leaf collars.



Mycogen SEEDS

Mycogen SEEDS

FOCUS: STAND QUALITY

Stand Quality is different from Stand Count!

- **Stand Count – The number of plants per acre**
- **Stand Quality - How the quality of the plants per acre affects later stages**
  - A plant came up late – how does that affect its productivity?
  - A plant is in a double or a skip – how does that affect its productivity?
  - What are potential ramifications on yields and feed quality?

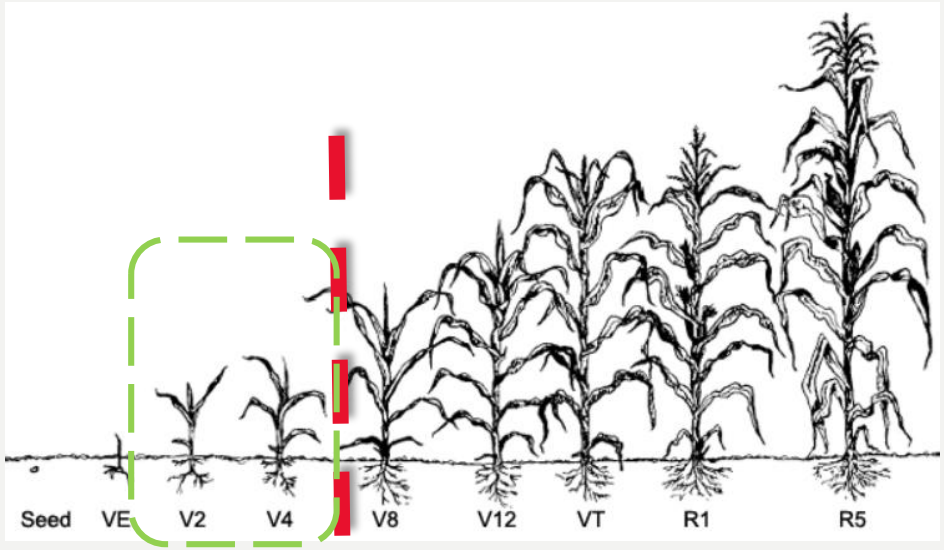
Focus is on the quality of the stand, and helping identify sources of issues and improvements

Mycogen SEEDS

FOCUS: STAND QUALITY

Ideally V2 to V4

- Early enough to dig for seeds
- Late enough to know all plants that will be up and see issues



Up to V6

STAND QUALITY

Initially what to look for?

VS

- What does the spacing look like?
  - **Skip – Is the seed there?**
  - **Double/Triple – Seed planted on top of each other.**

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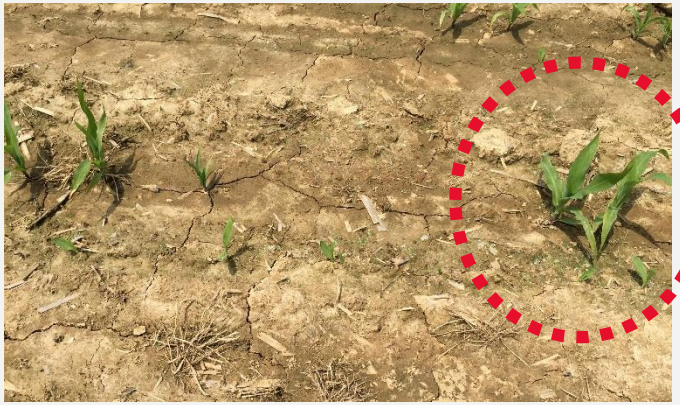
STAND QUALITY - DOUBLE



Two seeds right next to each other

- Compete for same resources; water, nutrients, sun light
- Reduction in stalk size, plant height and ear development of 1 plant or both
- Same holds true for late-emerging plant

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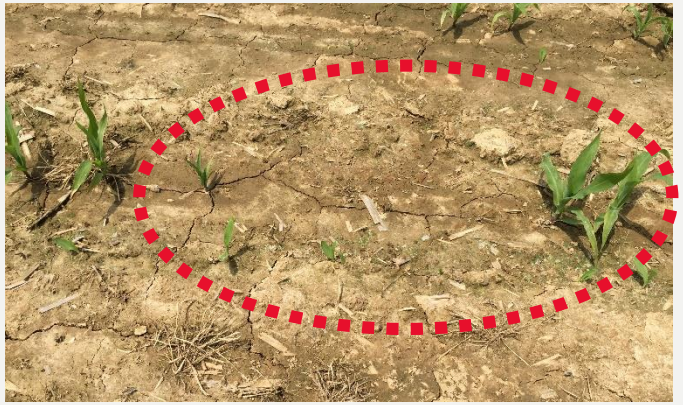
STAND QUALITY - SKIP



Is it a planter skip or is there something else going on?

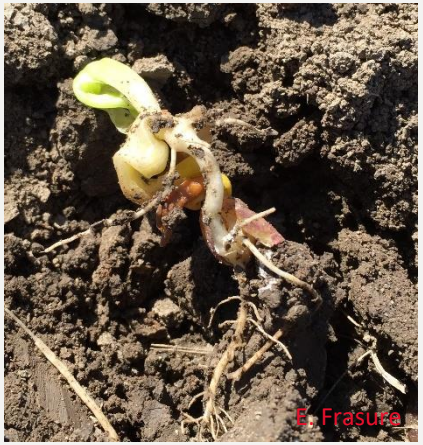
DIG, DIG, DIG!

Lost yield potential

1. No seed present

- Is the next seed a double?
- Residue?
- Planter issue?

2. Unleafing = soil crusting or cold soils



3. Seed present

- Rot?
- Insects?
- Disease?
- Depth?
- Moisture?
- **Stand quality issues**

STAND QUALITY

Planting is the most important time in a corn crops life, and sets the stage for what will be chopped and ultimately fed.

- **For "normal" yielding corn, about 1 ton of corn silage equates to 6-7 bu/A of grain at 30% dry matter***
  - A plant 1-2 leaves behind…how much does it contribute to yield?
  - A plant >3 leave behind… how much does it contribute to yield?
- **What value does even emergence provide to the grower in terms of milk production?**

*"Estimating Corn Silage and Grain Yields"; Mike Rankin

Mycogen® SEEDS

STAND QUALITY- THE MATH

Grower's Yield Goals				
			Grain Equivalent*	
Grower Yield Goal	24	Tons/A	168.00	Bu./A
Planting Population	32,000	Goal Plants/A		
Final Stand with 95% Germ	30,400	Final Plants/A		
Yield Per Plant	1.58	lbs/ Plant	0.31	lbs/ ear

Net Effective Stand	
Total # of plants in 1/1000 of an acre	31
Sets of Doubles	1
# of plants 1-2 leaves behind	1
# of plants >3 leaves behind	1
# of Lost Productive Plants (per/ac)	3000
Net Effective Stand (per/ac)	28,000

Rounded up from 30.4
(plants in 1000th of an acre)

Net Effective Stand Score			
Germination Rate	97%	Grain Equivalent*	
Net Effective Stand %	92%		
Yield Potential Improvement Opportunity (T/A)	1.90	13.82	Bu./A
Corn Silage Value Per Ton	$ 40.00		
Dollar Per Acre Improvement Opportunity ($/A)	**$ 76.00**		

Using University of Wisconsin Data of 7.0 bu. Per 1 Ton of corn silage

Mycogen SEEDS

STAND QUALITY- THE MATH

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			Grain Equivalent*	
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(30400 – 28000) x 1.58/2000 = 1.90 T Potential Improvement

1.90 x CS Value/Ton = $/Acre Improvement Opportunity

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STAND QUALITY- FEED QUALITY

- Even emergence drives more consistent ears and stalk size, for better yield, but what else does even emergence drive??
- <u>Better Quality feed!</u>
  - Plant stover is 60-40% of overall tonnage. Even emergence promotes consistent stalk size and height relative to neighboring plants, which provides more consistent feed, and more digestible plant matter with increased tonnage.
  - The ear is 40-60% of overall tonnage, and effects starch content. The more consistent the ear size, the better the starch analysis, and the more consistent the feed.

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Consistency is the key!

Mycogen SEEDS

THE VALUE OF STAND QUALITY

Stand Quality and the value of feed quality!

Your bread and butter!

- What is 1 extra ton of corn silage worth?

Relative Maturity	Silage Type	Average of Yield (Ton/Ac)	Average of % H2O	Average of % NDFD	Average of % Starch	Average of Milk/Ton	Average of Milk/Acre	1 Ton Value
90-100 RM	BMR	19.5	62.2	66.1	35.4	3,603	23,199	**$576.48**
105+ RM	BMR	21.8	65.5	65.3	30.4	3,488	24,237	**$558.15**
Grand Total	BMR	21.2	64.6	64.8	32.8	3,529	23,675	**$564.72**

Relative Maturity	Silage Type	Average of Yield (Ton/Ac)	Average of % H2O	Average of % NDFD	Average of % Starch	Average of Milk/Ton	Average of Milk/Acre	1 Ton Value
90-99 RM	TMF	20.6	61.8	56.1	35.0	3,316	21,311	**$530.50**
100-110 RM	TMF	24.7	65.0	53.2	31.6	3,224	24,499	**$515.79**
111+ RM	TMF	24.4	66.5	52.0	30.4	3,202	24,712	**$512.27**
Grand Total	TMF	24.0	64.9	53.4	32.0	3,234	24,145	**$517.52**

Mycogen SEEDS

THE VALUE OF STAND QUALITY

Stand Quality and the value of feed quality!

Your bread and butter!

- What is 1 extra ton of corn silage worth?

If your silage tests out at **Milk/Ton** (a quality parameter) of **3488 pounds of milk**

If milk is valued at **$13.50/hundredweight (cwt),** doing the math:

(3488# is 34.88 cwt)

34.88 cwt X $13.50/cwt = **$470.88 value per ton**

If you lose the tons in the field, what is that worth??!!

Mycogen SEEDS

LONG STORY SHORT

Even emergence improves not only overall yield, but helps improved consistency in feed quality.

- **Increased tonnage provides more NDFD and more starch to the dairy producer.**
- **Dairy producers will have better ROI on farm inputs by having better stand quality.**
- **Stand quality helps ensure better success of silage production by *relating stand quality to feed quality*.**

Stand quality sets the stage for the year!

Stand Quality Issues

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STAND QUALITY ISSUES - CAUSES

A seed should be planted to…

1. **Uniform depth – 1 ½ ” to 2”**
2. **Uniform moisture**
3. **Uniform temperature**

Seed to Soil Contact

- Important for seed to imbibe water and start germination
- Poor seed to soil contact results in
  - Poor germination, or no germination
  - Delayed emergence
  - Uneven emergence
- Can be caused by many factors including open furrow from wet conditions

STAND QUALITY ISSUES – SOIL TEMP

Minimal soil temperature for planting corn?

- **Minimum 50ºF at planting depth during the day for several days**

Location	Planting Date	Ave. Soil Temp. 4 Weeks Post-plant	Final Stand (%)
Michigan	Apr 16	56 °F	90
Minnesota	Apr 23	48 °F	81
North Dakota	Apr 11	41 °F	61

* Data for 100 hybrids across all CRMs.

Cold Injury or "Chilling Effect"

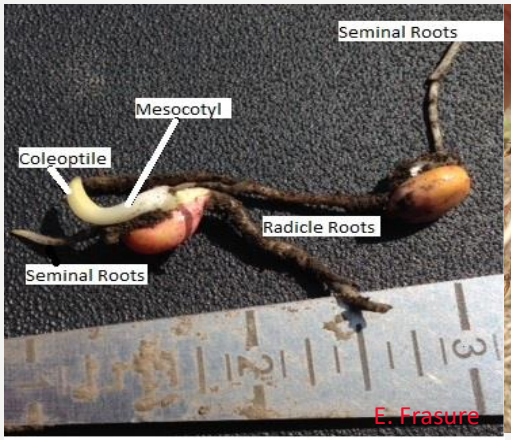
- Happens during first 24 to 48 hours
- First water absorbed is cold causing cells to rupture
- Seed is swollen, but no sign of germination
- Can cause radicle root and coleoptile damage at start of germ.
- Cork-screwed mesocotyl
- Caused by soil temps less than 50 degrees F.
- Extended cold soil periods
- Temperature swings in soil

SEED QUALITY – SEEDLING DISEASE

- **Early seedling disease is typically only thought of in soybean because corn always comes treated, but disease can happen in corn as well**
- **Conditions:**
  - **Cool conditions, wet soils, prolonged exposure in the ground to disease**
    - Seed treatments are good for around 21 days to help give protection
    - Seed treatments protect, but only for so long, cannot make up for planting too early or too wet

Healthy Roots

1. Are all pieces there?
2. White mesocotyl and roots
3. Nodal roots



STAND QUALITY ISSUES - INSECT

Early insect damage occurs at soil surface or below ground

- **Feed on seed, seedlings, roots, crown below ground**

Wireworms – April through June

Feeding Wireworm
Photo by J. Obermeyer

- **Missing plant or seed, misshapen seed**
- **Leaves of the Whorl of plant wilted**
- **Hole in lower stem**

STAND QUALITY ISSUES - INSECT

White Grubs – May through June, but there are multiple species of grubs that can attack corn throughout season

Larvae (grubs)
Photo by J. Obermeyer

Damaged root system compared to healthy one
Photo by S. Dlugosz

- **Dead or missing plants above soil**
- **Pruned roots or mesocotyl**

STAND QUALITY ISSUES - INSECT

Black cutworm – April through June, larvae are only visible at night

Larvae
Photo by J. Obermeyer

Young larva and leaf damage
Photo by S. Dlugosz

- **Cut plant off at soil line**
- **Can chew through young plant resulting in holes**
- **1 BCW can feed on 4 plants**
- **BCW infestation more likely in wet areas with lots of weeds. Watch areas that may have had a rye cover crop killed before planting.**


Bringing it together

KNOWING THE IMPORTANCE AND FACTORS OF STAND QUALITY

Can help you understand more than just how many plants are out in a field – it can HELP YOU GROW HIGHER QUALITY corn silage.

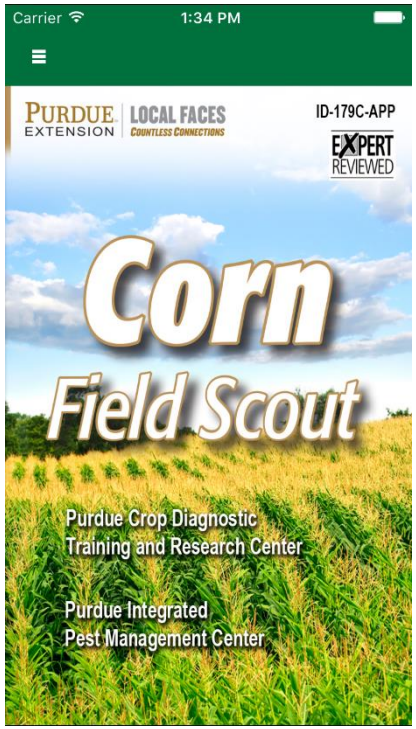
- **Even emergence (within 24 - 48hrs) – key to setting the stage for crop performance.**
- **Protecting early season root growth – critical for the overall plant health and future development.**
- **There are lots of pests that can challenge early season growth. (You do not have to know the specifics of each, but it is important for you to recognize there is a problem)**
- **DIG, DIG, DIG!**
- **Know the value of the effect on feed quality.**

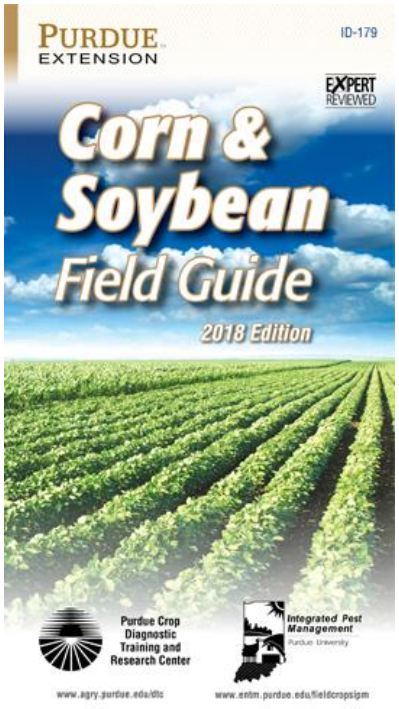
Mycogen® SEEDS

KNOWING THE IMPORTANCE AND FACTORS OF STAND QUALITY

Gives you the opportunity to understand and set expectations for the upcoming silage crop!

To help you:





https://edustore.purdue.edu/newsearch.asp?subCatID=286 &CatID=10

Today: First 10 attendees to send an email to Claire will get a copy sent to them!

clairyce.ohman@mycogen.com

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To help you:

A downloadable PDF file from Iowa State University on Corn Growth & Development

https://www.ipm.iastate.edu/files/03%20Corn%20Growth%20and%20Development.pdf

GROWING TogetHER Field Day

Coming to Wisconsin in June!

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Questions

Thank you for attending Dairy Girl Network's Enhance Webinar

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