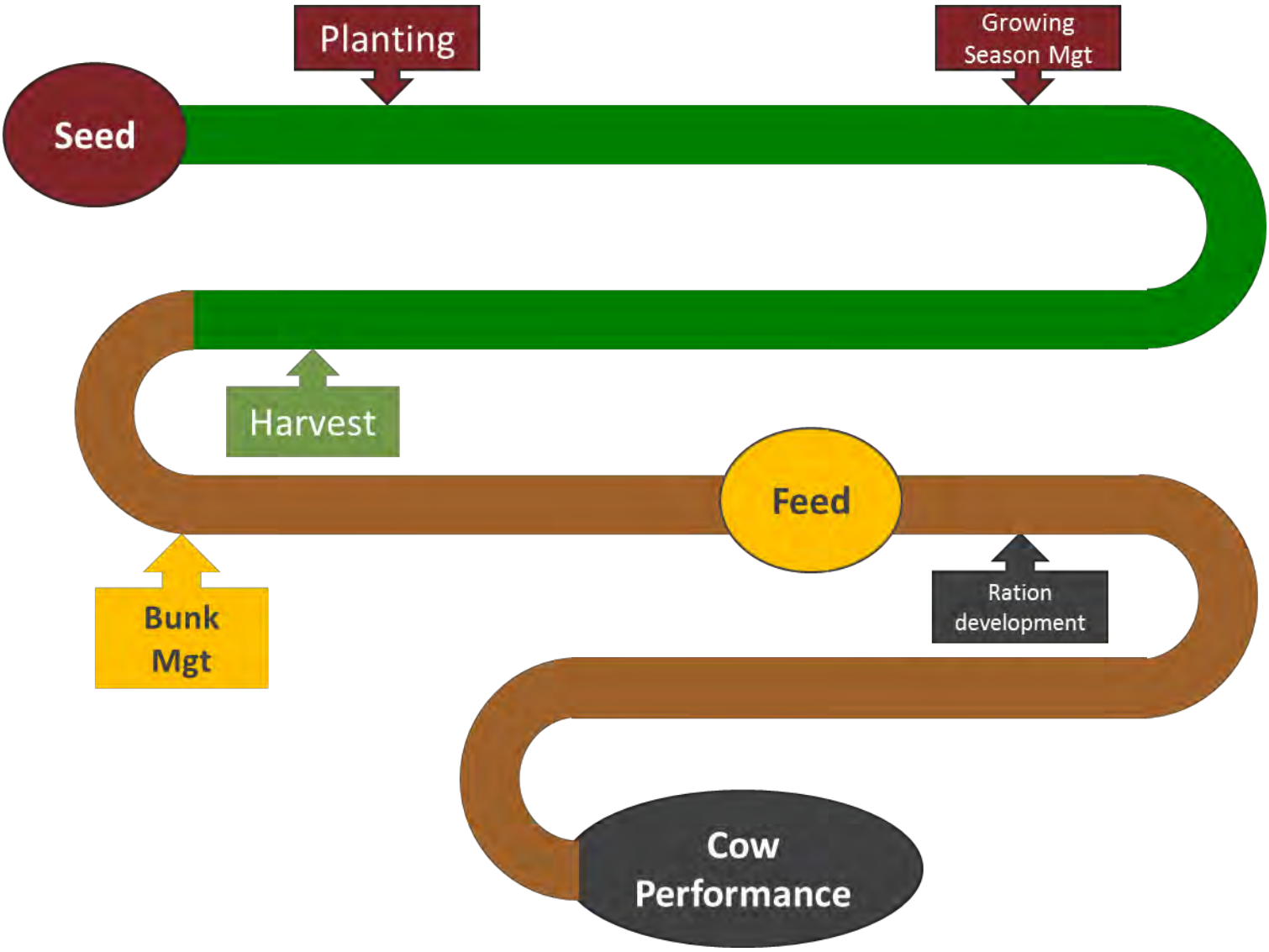
Silage pit in the Central Valley (late 1930's)
Photo Courtesy of Alan George, retired UCCE Farm Advisor in Tulare County

Silage management to reduce losses and improve nutrient quality

Rich Bennek
Mycogen Seeds Dairy Development Manager
919.449.5056 rebennek@dow.com


Planting
Growing Season Mgt
Seed
Harvest
Feed
Bunk Mgt
Ration development
Cow Performance

Outline

- Harvest
  - Targeting proper dry matter
  - Kernel processing and theoretical length of cut
- Storage
  - Packing density
- Feedout
  - Face management

Highly Digestible CS is the Key to Lower Feed Costs and Healthier Rations

Cost/Lb. of Dry Matter

Corn Silage	$.05-.08
Corn Meal	$.11
Soybean 48	$.23
Canola	$.19
DDG's	$.11
Cottonseed	$.10
Soy hulls	$.08

My Cows Rumen

Harvesting

Target: 30-36% Dry Matter

Too early < 29%

- Low Starch
- Acetic Acid > 4%
- Total fermentation acids >10%
- Seepage

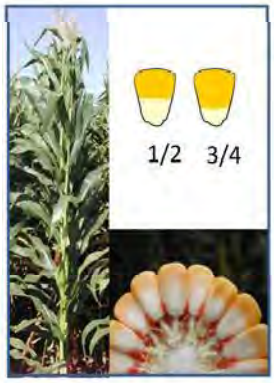
Too late > 36%

- Starch Digestibility
- Aerobic Stability
  - Packing
  - Lower production of acids that inhibit yeast

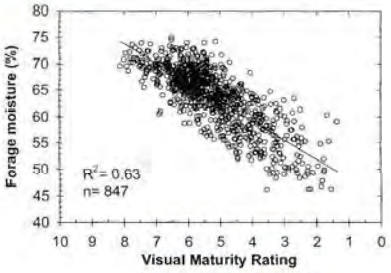
How Do We Determine Dry Matter?

Harvesting

Dry Matter Estimation Visual Evaluation



Milk Line (2/3)
Stover Maturity



(Lauer, 2006)

Harvesting Corn Silage

Dry Matter Determination
Empirical

Kernel Processing and Theoretical Length of Cut

Harvesting

Guidelines: Harvesters Settings
(by Mike Hutjens)

<33% DM	0.75 -0.90 in. TLC Open rollers
33-38% DM	0.75 -0.90 in. TLC 0.12 in. Rollers
>38% DM	0.50 in. TLC Close Rollers

Harvesting

Kernel Processing Improves:

- Handling and Packing
- Starch Digestion
- Fiber Utilization
- Feed Intake
- Reduces Feed Sorting

Too Much Processing:

- Decreases effective fiber
- Favors rapid fermentation -> rumen acidosis

Too Little Processing:

- Kernels lost in feces
- Difficult Packing
- Sorting increased

Harvesting

Evaluate the Broken Kernels

Picture Courtesy of Dr. Limin Kung Jr.

Separate kernels in a bucket of water

Guidelines:

- **90 - 95% cracked**
- **70% smaller than ¼ of a kernel**

Nicking and Crushing is not enough

(Mertens, 2005)

Packing Density

Packing Density

- **Dry matter**
- Delivery rate
- Tractor weight
- Tractor time
- Theoretical length of cut
- Packing layer thickness

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Face Management

Feedout

Feedout Losses: 1 to 10 % of DM

-Silo is exposed to oxygen

- Yeast metabolizes lactic acid

- Silage pH increases.

- Undesirable bacteria are able to grow and further spoil the silage.

Feedout

High Removal Rate

6-12 in./d in winter
18 in./d in summer

In a well packed silo, air moves 3ft.

With a removal rate of 6 inches/d the silo will be exposed to oxygen for a week before feeding.

Muck and Huhnke, (1995)

Feedout

Remove Only What Is Necessary

No silage left after feeding is done.

Minimize the time the corn silage stays in the commodity area before it is added to the ration.

Feedout

Smooth Face

Prevent crack formation that favors air penetration

Tight Face

Keep air out of the edges and seams

Picture Courtesy of Dr. Limin Kung Jr.

Dairy 1
544J
DEERE

DEERE

DEERE

DEERE

Dairy 1
DEERE

Dairy 3

Questions? Comments… Concerns!

Thank you for your time and attention

Have a Safe Harvest

Remember our Veterans on Memorial Day