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Corn Silage Management Practices on California Dairies

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Objectives

1. Describe current silage management practices on California's San Joaquin Valley dairies.

2. Identify opportunity to optimize silage management.

Methodology

In April 2013, a silage management survey was mailed to dairy producers in California's San Joaquin Valley.

Methodology

Producers received an envelope containing:

1) an invitation letter to participate in the study,

2) a double sided two-page survey, and

3) a pre-paid return envelope.

Participant Dairies

Response rate was 14.5% (161/1,100).

Herd size:

- **< 500 cows (n=21)**
- **500 to <1,000 cows (n=40)**
- **1,000 to <2,000 cows (n=46)**

Results Outline

- ❑ Silage Harvest
- ❑ Silage Covering
- ❑ Monitoring Silage
- ❑ Silage Feeding
- ❑ Future Considerations

Silage Harvest

Who decides the harvest date?

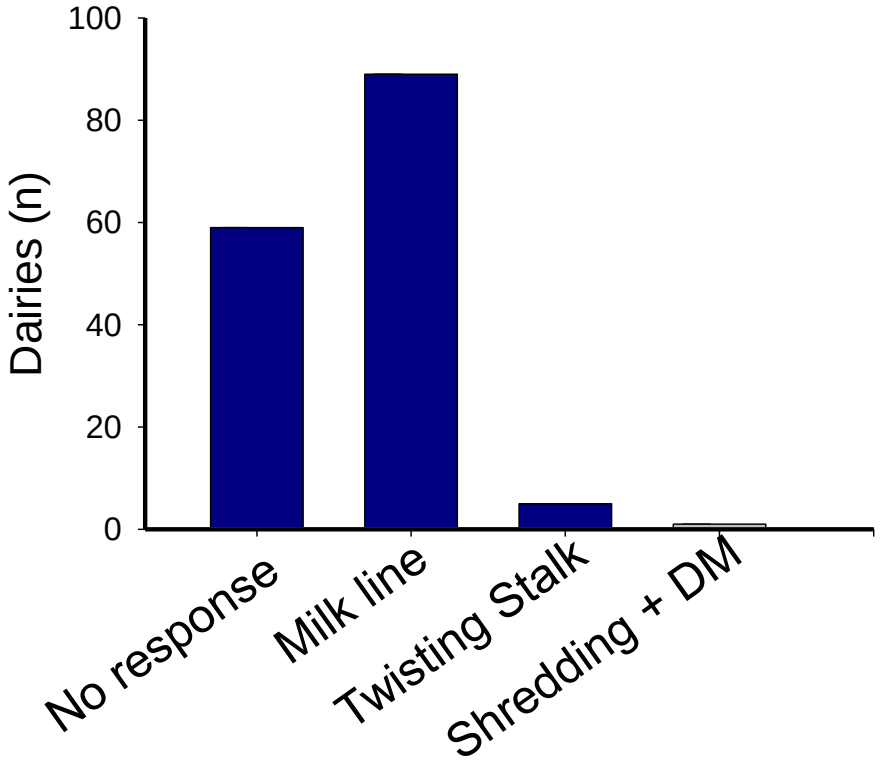
Who decides harvest date?

- **Dairy producer alone (53.5%)**
- **Dairy producer + Grower, Chopper and/or Nutritionist (23.3%)**
- **Chopper (12.0%)**
- **Grower (7.3%)**
- **Nutritionist (0.7%)**

- No dairies involved all members of the silage team.
- Nutritionists were involved in only four dairies.

How is dry matter evaluated prior to harvest date?

Dry Matter Determination



- A total of 37.5% of the surveys provided no information on how dry matter was evaluated. Almost all respondents estimated dry matter by checking the milk line.

What is the chopping capacity during harvest?

Chopping capacity

N= 145		N= 147	
Number of Choppers	Dairies (%)	Chopper Size	Dairies (%)
1	35.9	6 row	17.7
2	50.3	8 row	67.3
3	11.1	10 row	15.0
4 or 5	2.7		

- Most dairies used two choppers during harvest.
- The most popular chopper size was 8 row.
- In 25% of dairies, harvest capacity was 16 rows or more (up to 40 rows)

What is the packing capacity and delivery rate?

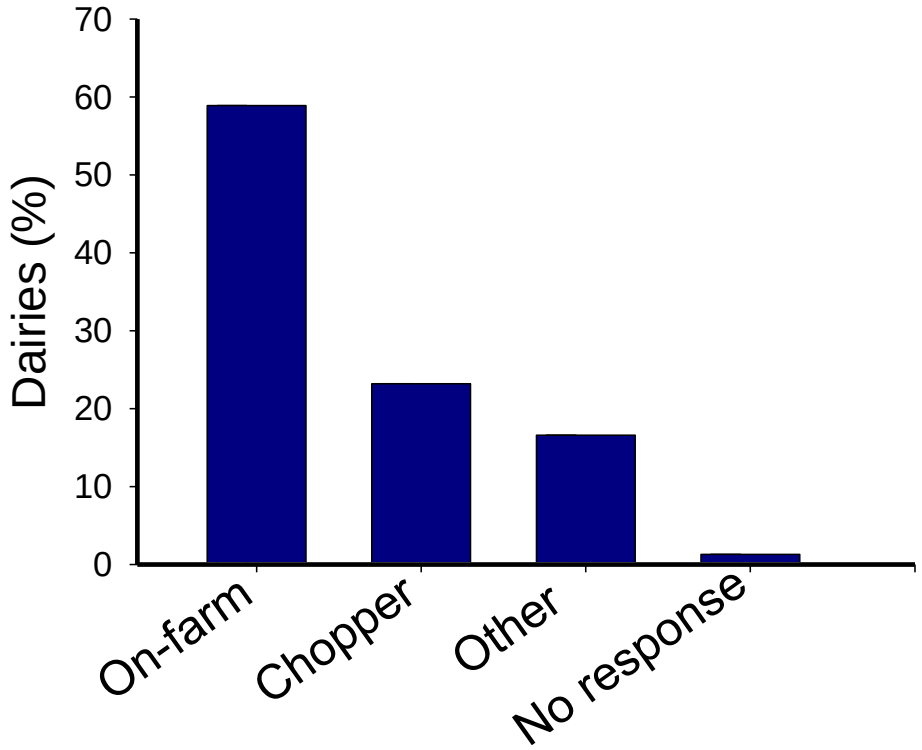
Packing Tractor and Delivery Rate

	N= 145	N= 37
Packing Tractors	Dairies (%)	Mean Delivery Rate (tons/h)
1	70.3	186
2	28.9	179
>2	1.4	200

- Most dairies were using a single packing tractor.
- In 50% of dairies, delivery rate ranged from 150 to 200 tons/hour.

Do you weigh every truck load during harvest?

Truck Load Weights



- **Only 62%** of dairies weighed every truck load delivered to the dairy. An on-farm scale was the most common scale used.

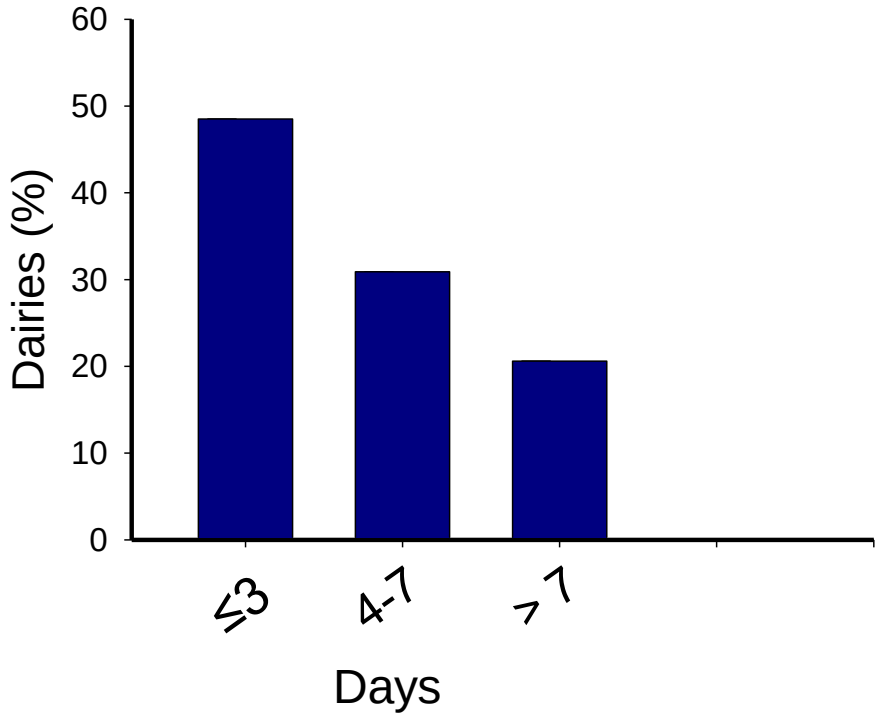
How many varieties and fields do you put in one silage structure?

Fields and Varieties in One Structure

- **Number of fields:**
  30% of dairies put six or more fields in the same silage structure (up to 21 fields, 3,000 cow herd).
- **Number of varieties:**
  23% of dairies planted three to five varieties.

How long does it take to fill the largest structure?

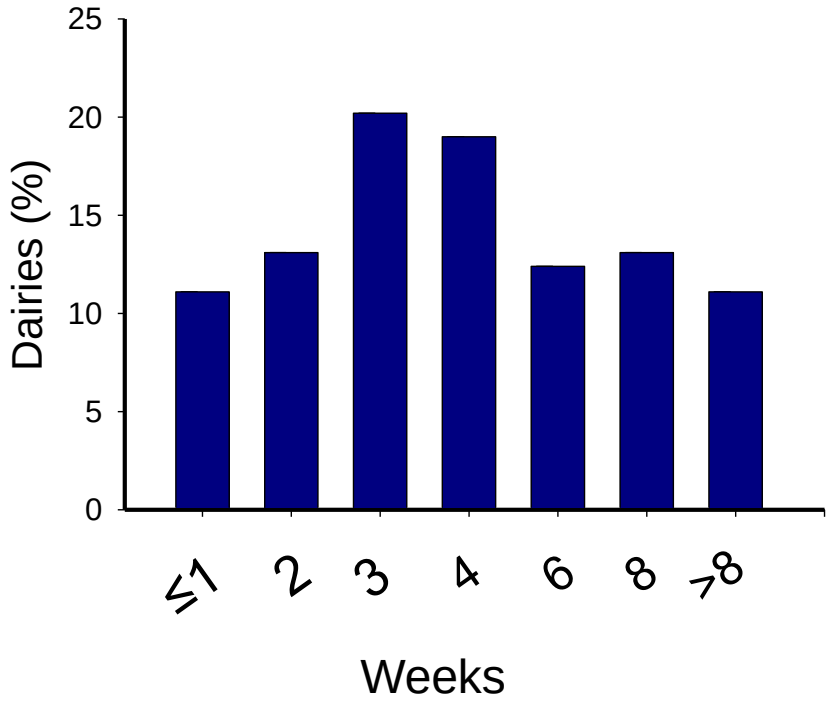
Filling Silage Structure



- Most dairies (48.5%) filled their silage structure in ≤ 3 days.
- In four dairies, filling the silage structure took 30 days or more.

How long do you wait before feeding?

Time Before Feeding



- Only 11.1% of the producers waited more than 8 weeks before they fed the new silage.

Do you use inoculants during harvest?

Inoculants

Picture courtesy of Luis Solorzano

- Inoculants were used in 56% of the dairies.
- Inoculants were applied on the chopping equipment (72%), on top of the truck (21%), and during packing (7%).

Silage Covering

When do you cover your silage?

Covering Silage Structures

- Most dairies **(68.8%)** covered their silage structure within **24h** after structure completion. All dairies covered by 72h.
- A total of **20%** of the dairies reported to cover silage as it was filled.

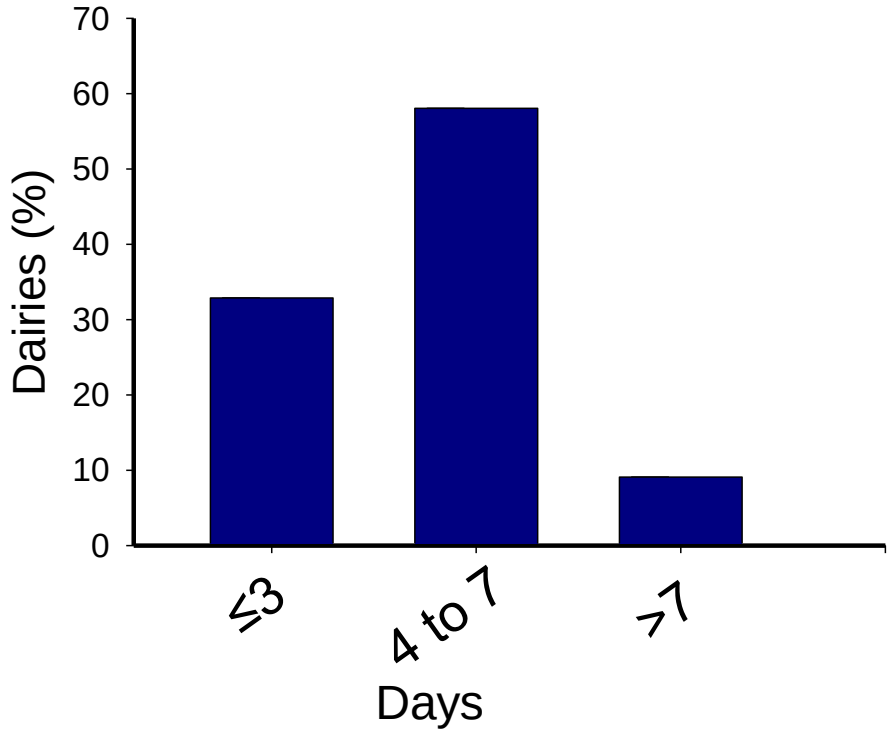
What do you use to cover your silage?

Covering Silage Structure

- Double plastic layer was used by 70.9% of the dairies. Most of those using double plastic layer (88.4%) used oxygen barrier technology.

How often do you pull your plastic back?

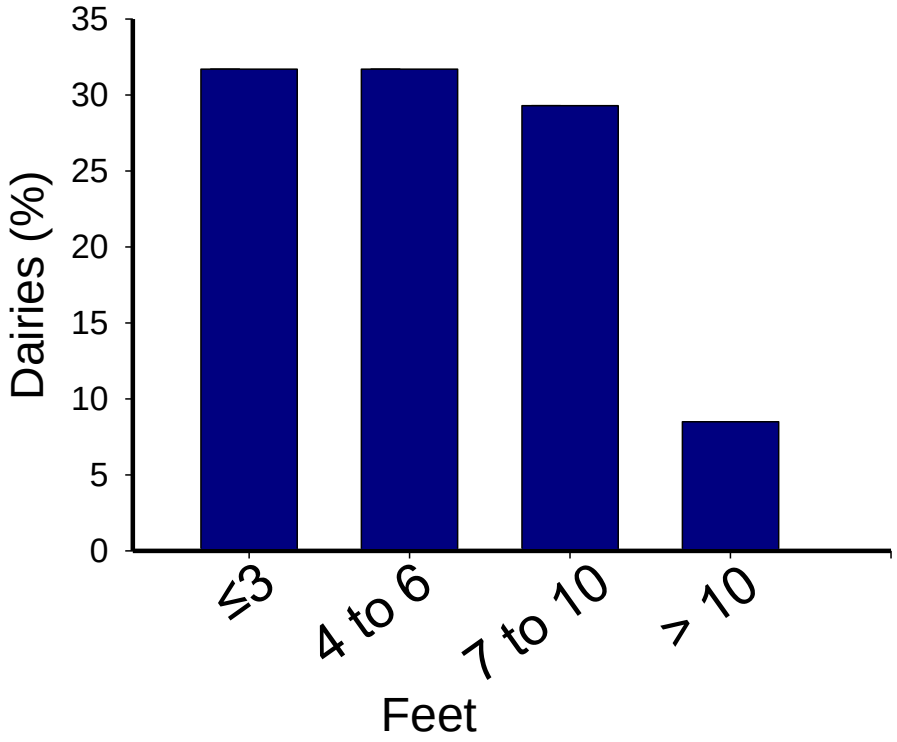
Removing Plastic



- A total of 45.5% of the dairies reported pulling back the plastic once a week.

How many feet of plastic are you removing?

Feet of Plastic Removed



- A total of 36.4% of the dairies reported pulling 7 feet or more of plastic each time.

Silage Monitoring

Do you evaluate DM during harvest?

Dry Matter during Harvest

Dry Matter Method	Dairies %
Commercial Lab	41.7
Koster tester	39.6
Microwave	5.9
Commercial lab plus microwave/koster	11.8
Squezing/Truck weights	1.0

- Only **67%** dairy producers monitored dry matter during harvest.

Do you evaluate particle length and kernel processing?

Particle Length

- Chop length was monitored in 80.4% of the dairies. Only 4% of the dairies reported to monitor chop length with a measuring tape or Penn State Shaker box.

Kernel Processing

- Most dairies (92.5%) monitored kernel processing. Most of them visually, and only 4% by using the bucket method.

Silage Feeding

How do you remove your silage from the structure?

Silage Removal

- 85.1 % front end loader
- 10.8% rake
- 4.1% facer

What is the depth and width removed each day?

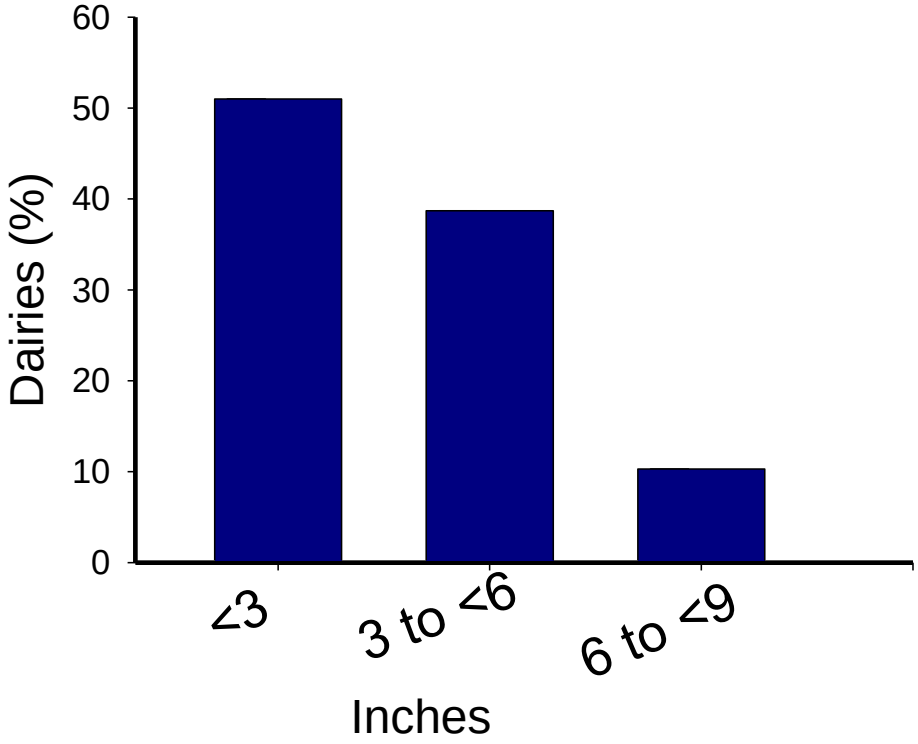
Width and Depth Removed

	Dairies (n)				
Width Removed	Depth Removed (in)				
	< 6	6 to <12	12 to < 18	> 18	Total (%)
Whole	22	15	20	19	53.9
Half	6	6	6	3	14.9
Third	8	7	14	10	27.7
Fourth	0	2	1	2	3.5
Total (%)	25.5	21.3	29.1	24.1	n=141

- Whole width of the face was removed in 53.9% of the dairies.
- <6 in. were removed in 25% of the dairies.

How many inches of spoiled forage are on the top surface?

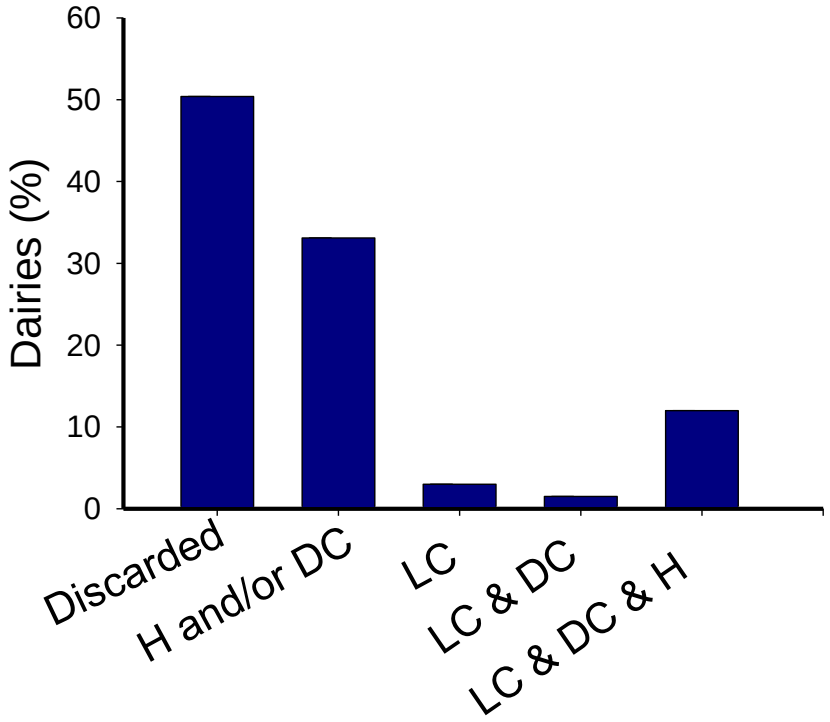
Top Surface Spoilage



- A total of 10% of the dairies had spoilage above 6 inches

What animals are fed the spoiled forage?

Feeding Spoil Forage



- 33% of the dairies fed spoiled silage to heifers and/or dry cows.
- 12% of the dairies fed spoiled silage to lactating cows, heifers and dry cows.

Future Considerations

Future Considerations

Future consideration for silage management	Dairies (%) 1†	2	3	Responses (n)
Increase silage storage area	24.3	55.9	19.9	136
Increase the number of packing tractors	29.7	37.0	33.3	138
Plant brown mid-rib (BMR) varieties	23.7	34.4	42.0	131
Buy a defacer to remove silage	13.7	33.1	53.2	139
Create drive-over piles	34.8	32.6	32.6	138
Pour concrete pads for silage storage	64.7	29.5	5.8	139
Harvest corn as shredlage	3.2	28.2	68.5	124
Purchase a farm scale	51.1	27.7	21.2	137
Use oxygen barrier technology film to cover	63.2	23.5	13.2	136
Use inoculants	57.8	17.0	25.2	135
Build bunkers	8.2	7.5	84.3	134
Kernel process corn silage	89.0	6.6	4.4	136

†**1** = I am already doing this; **2** = I would like to do this in the future; **3** = I will not do this in the future

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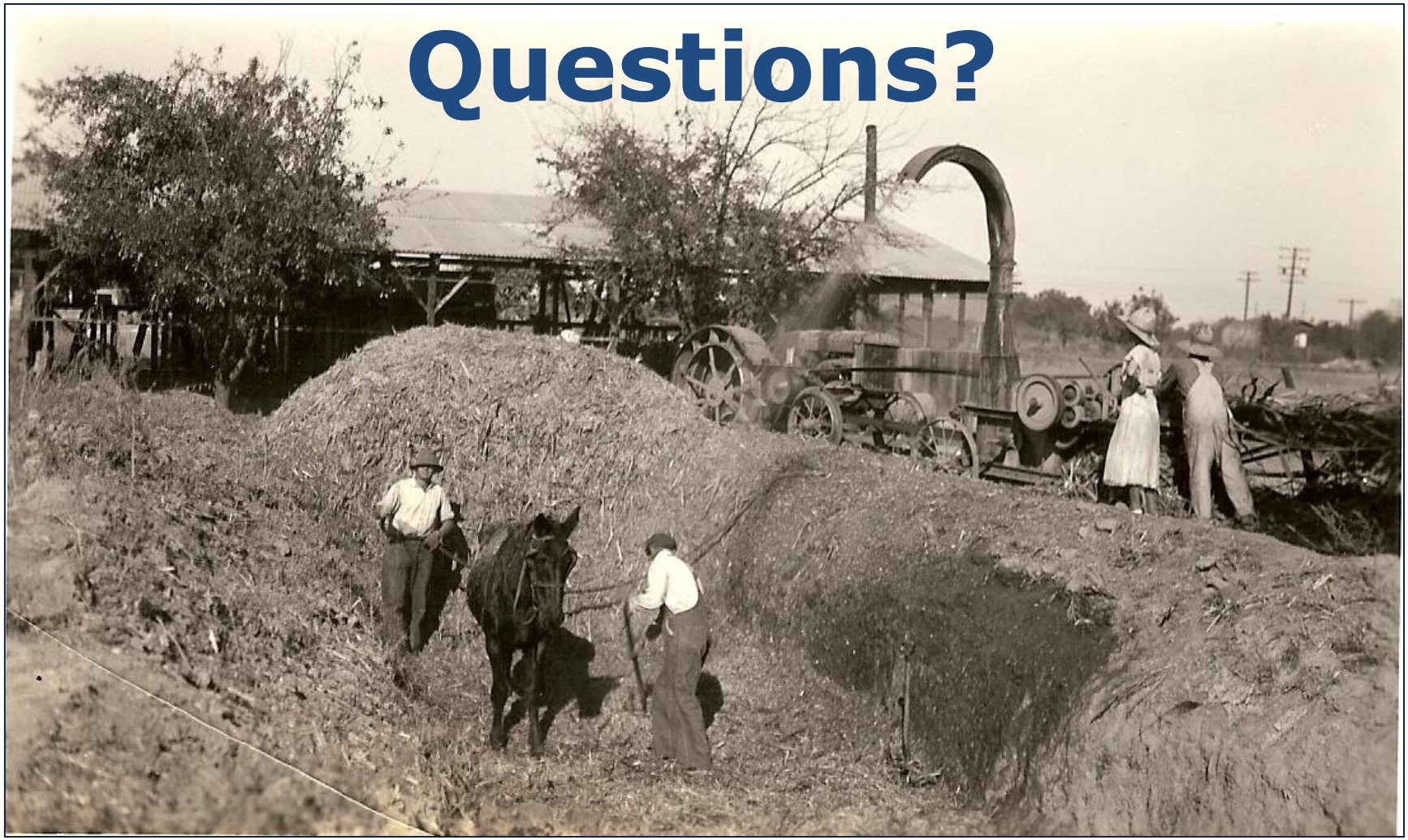

Silage pit in the Central Valley (late 1930's)

Photo Courtesy of Alan George, retired UCCE Farm Advisor in Tulare County