



ALFALFA MANAGEMENT

Insects and diseases

Dr. Romulo Lollato
Extension Wheat Specialist

KANSAS STATE
UNIVERSITY

Alfalfa weevil life cycle

Photo: KSU Entom.



Laying eggs
Fall and spring
Yellow at first
Orange-yellow

Photo: KSU Entom.



Larvae:
Small, light green worm
Large white central stripe
Smaller side stripes
Black head

300°F GDD
(~180 °F from
January 1st?)



Photo: OSU Entom.

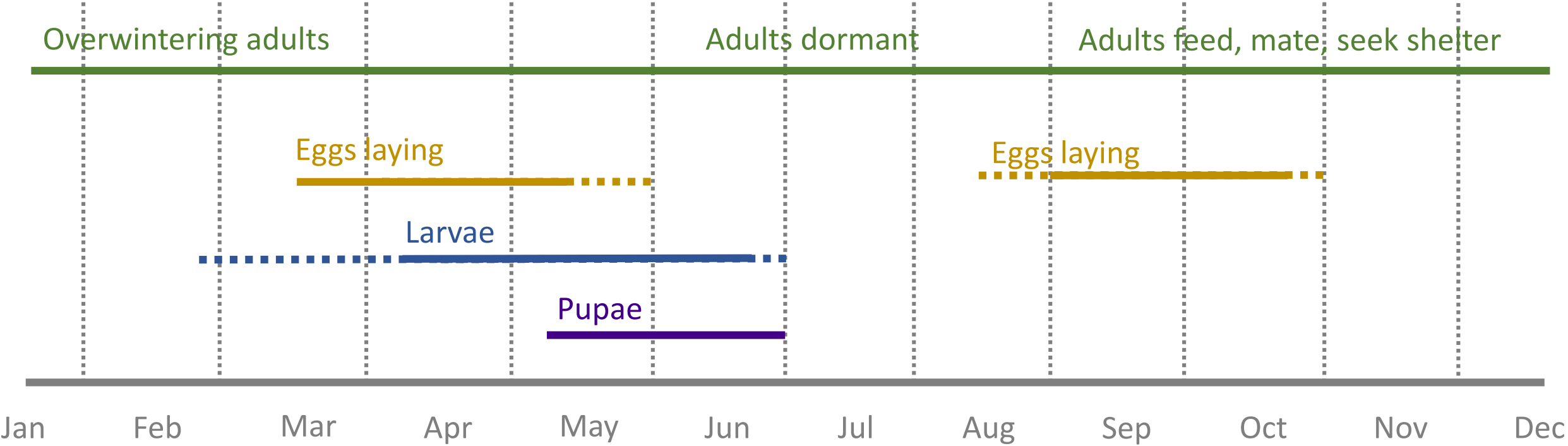
Feed until
~750°F GDD
(3-4 weeks)

Pupating in cocoon
10-12 days



Photo: Univ. IL

Alfalfa weevil life cycle



What does this look like in Kansas (Osborne)?

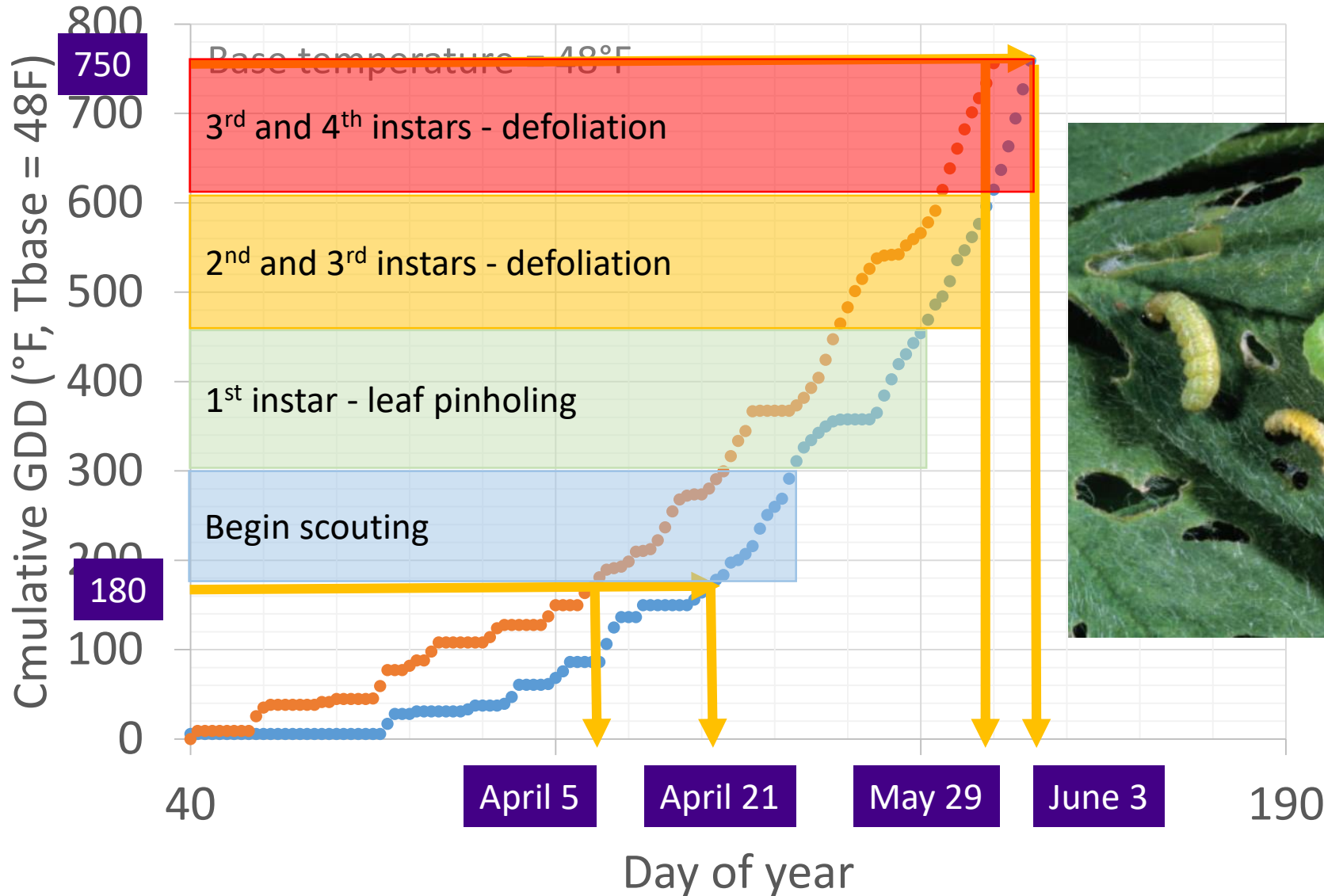


Photo: Purdue Entom.

Economic damage from alfalfa weevil

- Larvae start feeding after hatching
- First, pinprick-sized holes in leaves and terminals (as growing tips unfold)

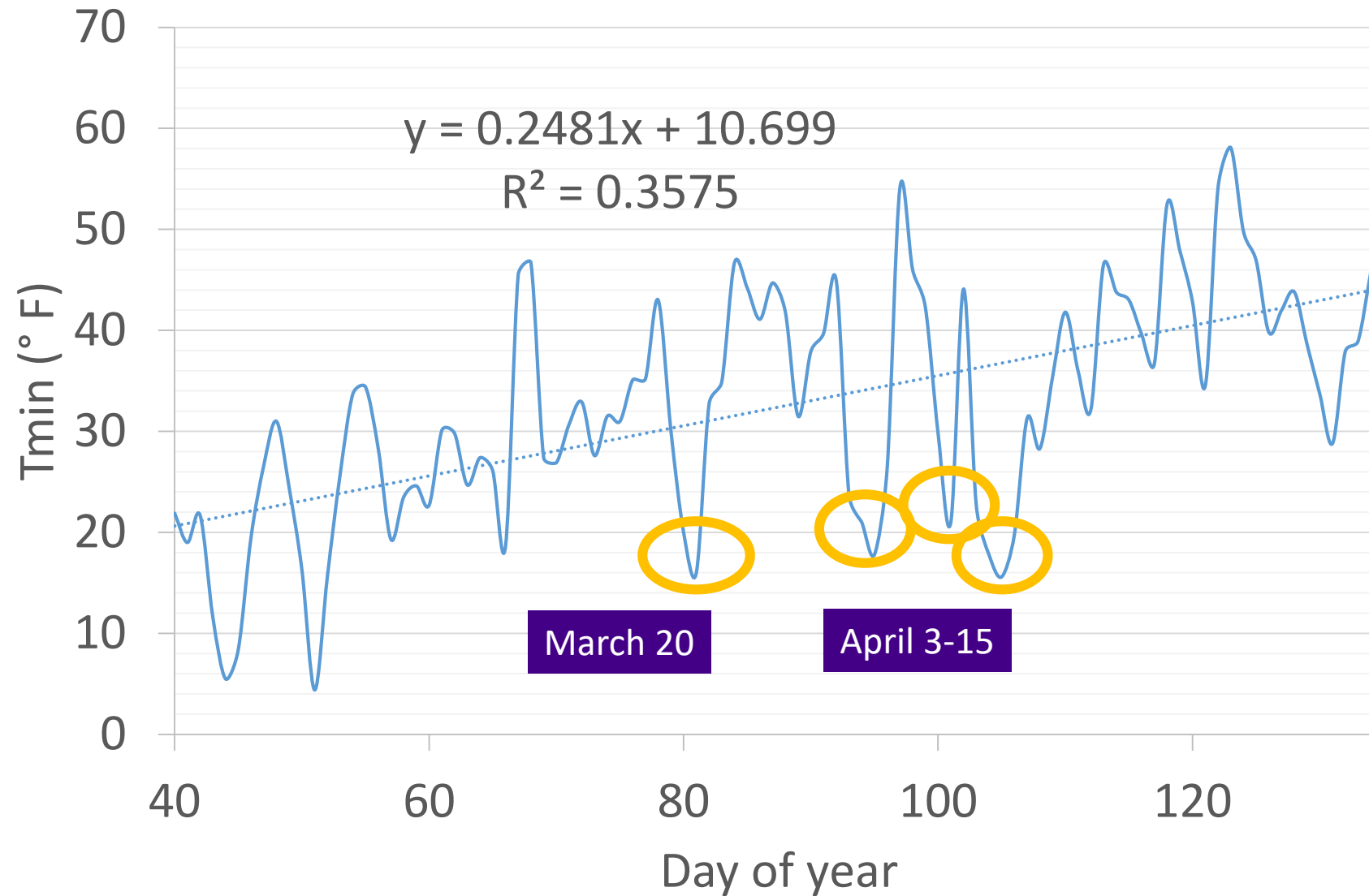


Economic damage from alfalfa weevil

- Feeding and defoliation become more obvious as larvae grow.
- Ragged, greyish-white appearance.
- Usually first cut is the one affected.



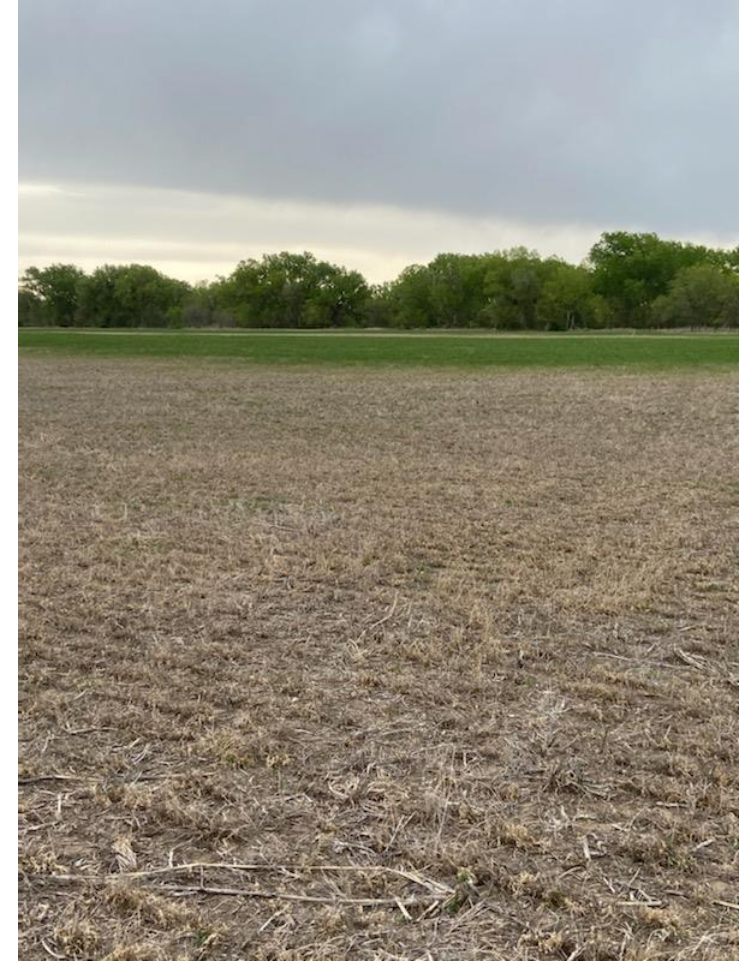
What happened in 2020?



Alfalfa update – Smith Co (April 20)



Alfalfa in Rooks Co (early May 2020) KANSAS STATE UNIVERSITY

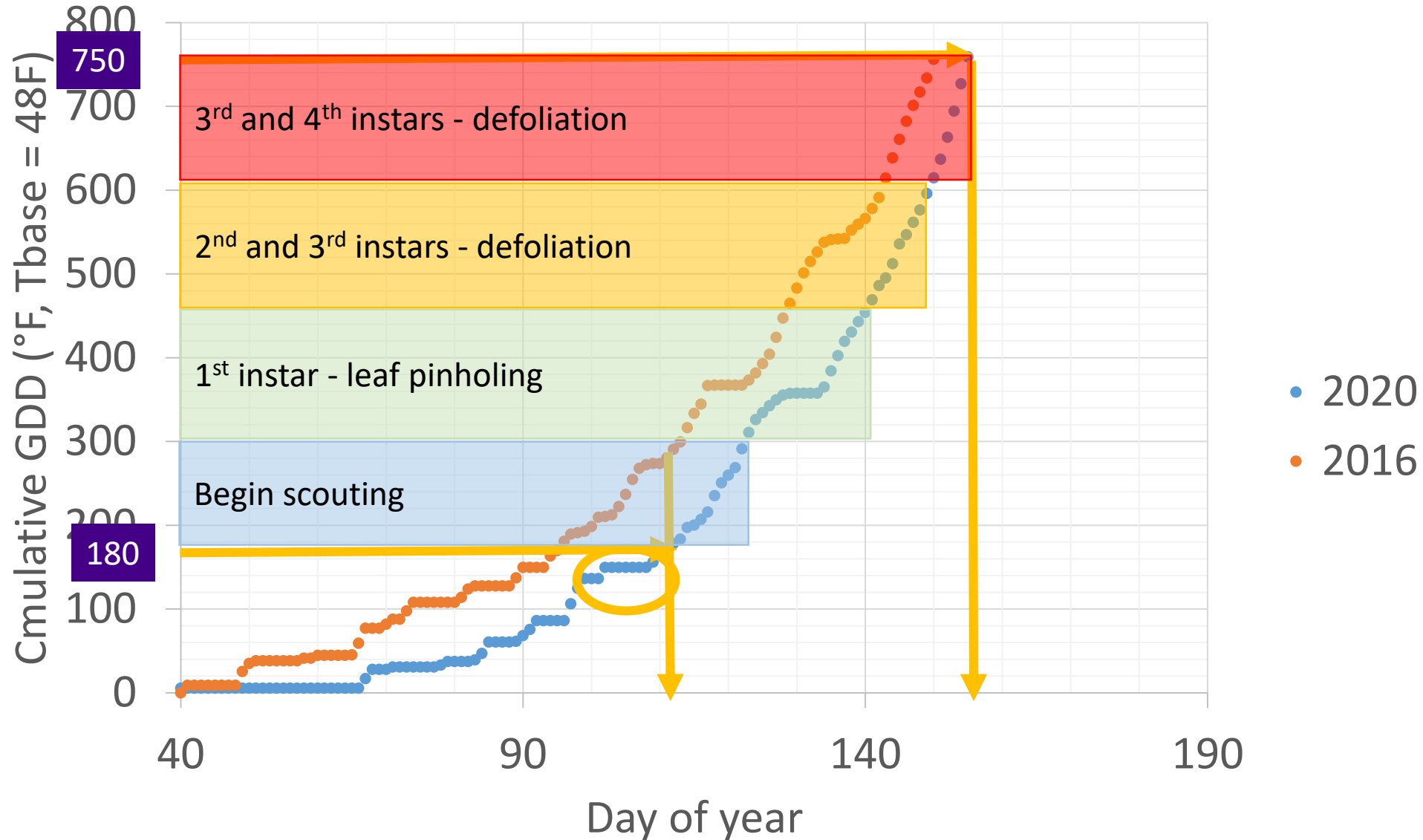


Images: Cody Miller

Alfalfa in Phillips Co (early May 2020)



What happened in 2020?



Recommendations – freeze damaged alfalfa

- Check for new growth:
 - From tips of stems: growing point unaffected
 - From crown buds: little regrowth from damaged stems
- Freeze-damaged alfalfa that is only 6-8 inches tall or less will be slower to regrow (plants are depleting carbohydrate reserves from the roots during the first 6-8 inches of growth).
- If mowing to encourage new growth (after 7-10 days and no regrowth), leave at least 2-3 inches of stubble to encourage regrowth
- Watch carefully for alfalfa weevil/pea aphids, and treat immediately (weevil larvae that survive in the leaf litter on the soil surface will start feeding on the new growth once the weather warms up).

Direct losses

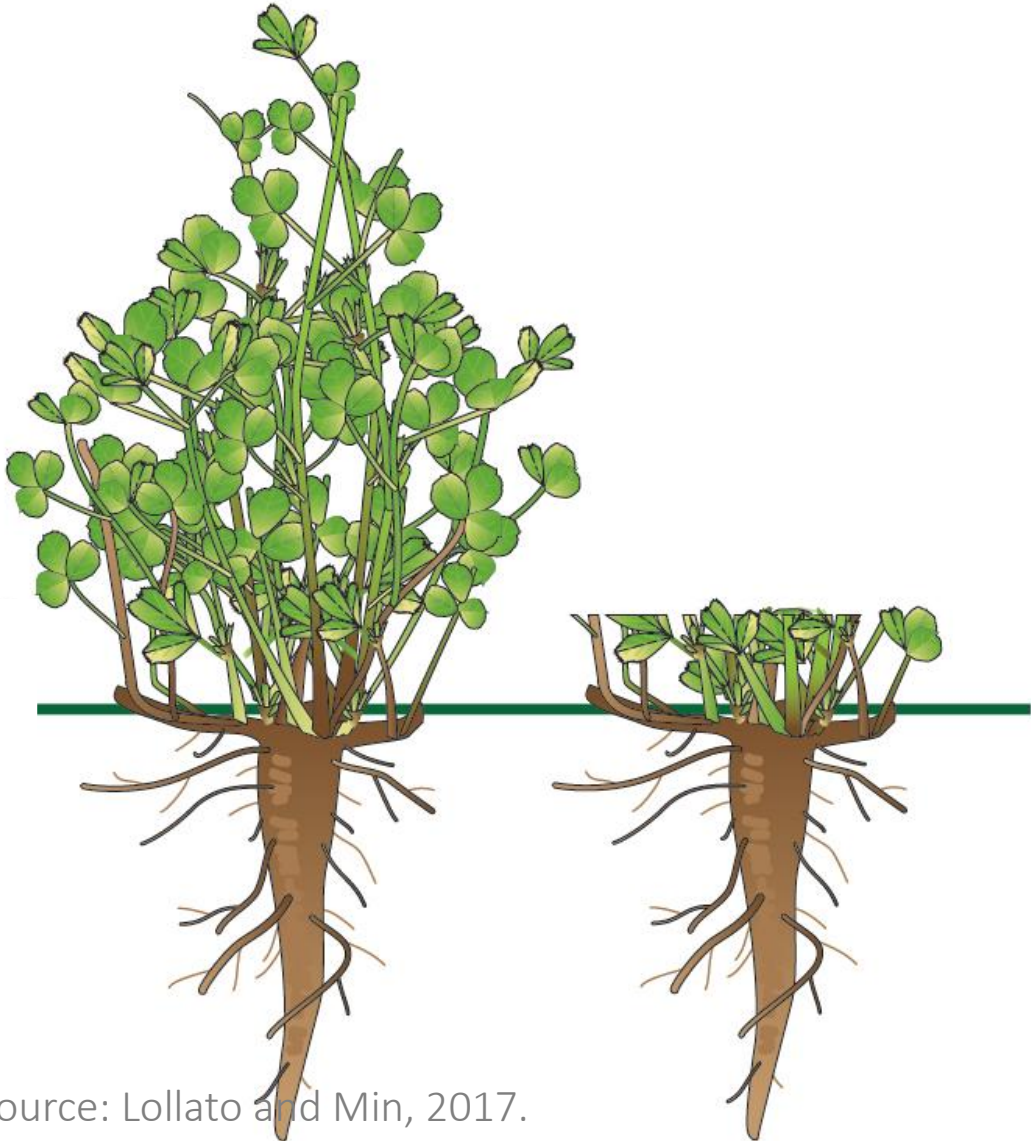
- At 30-35 stems per square foot:
 - Each additional larvae will consume 170 pounds of hay in its life cycle
- Direct losses can be of 1+ ton per acre in the first cutting.
- Heavy infestations delay crop's cycle (crop at pre-bud when should be in full bloom).
- Persistent weevil pressure greatly reduces stand life.
- Weevil feeding allows more light into canopy = more weeds.



Carryover losses

- Failure of plants to adequately recharge stored carbohydrates in the crown and root tissues prior to top-growth removal
- No stored energy to draw upon = slower regrowth
- Losses to subsequent cuts even in the absence of other stresses:
 - 2nd cut: 9/10 ton/acre
 - 3rd cut: 6/10 ton/acre
 - 4th cut: ¼ ton/acre

CUTTING MGT. FOR WINTER SURVIVAL



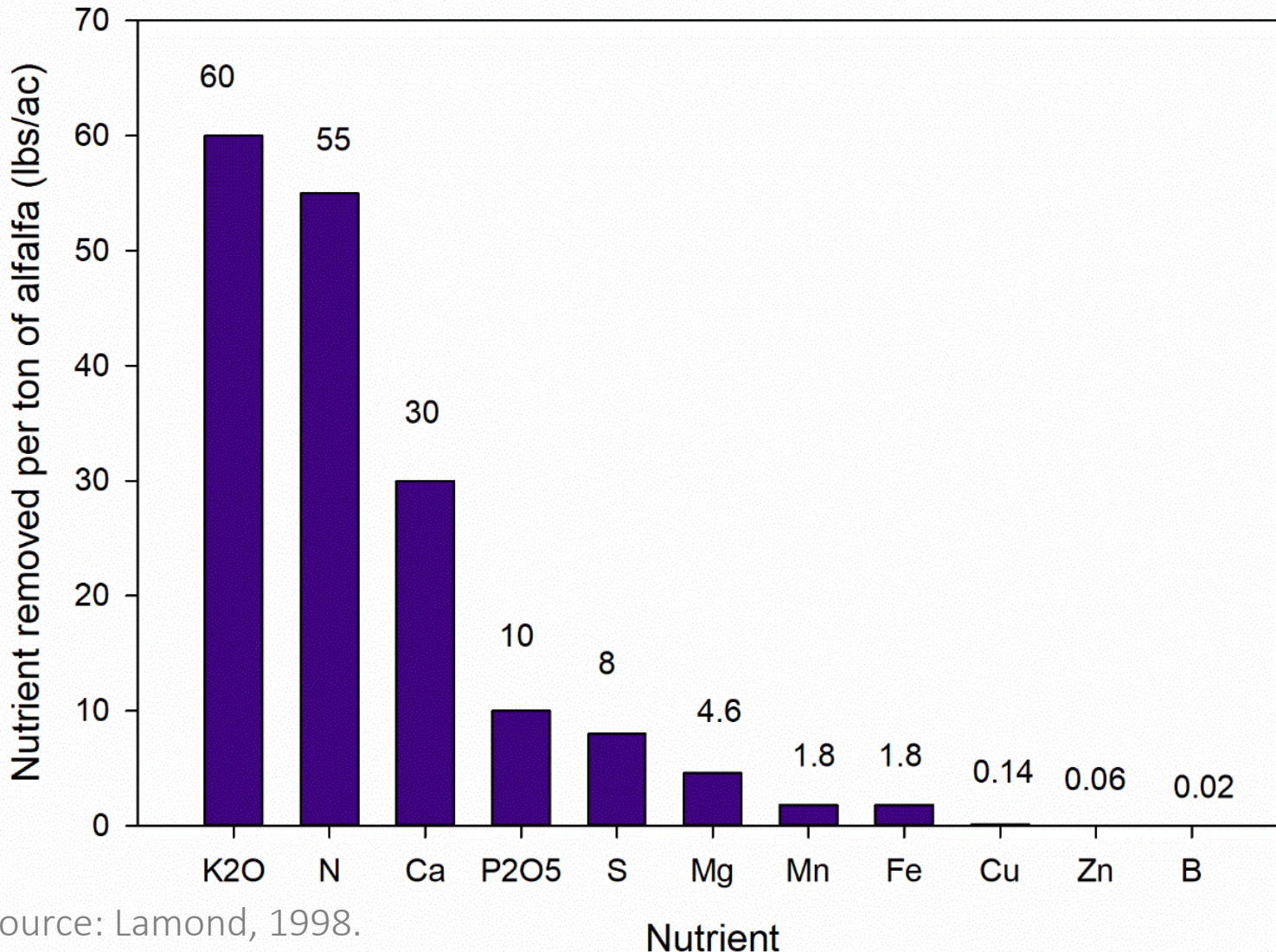
Cut about 2 inches above soil surface so axillary buds are preserved.

Avoid short (<28 days) cutting intervals)

Last cut prior to dormancy should leave 8-12 in stubble (or 4-6 weeks of growth) before the killing freeze for root reserve replenishment.

Adequate K levels increase chances of winter survival.

FERTILITY MANAGEMENT



High nutrient removal (3-5 cuts/year)

Responsive to lime, P₂O₅ and K₂O

Soil test prior to planting (4-6 years investment)!!

pH must be > 6.5

Source: Lamond, 1998.

PHOSPHORUS MANAGEMENT

Broadcast pre-plant or in-furrow (no more than total 10 lbs N + K with seed).

Broadcast existing stands fall or early spring (roots near surface).

Table 2. Phosphorus Recommendations for Alfalfa

Condition	Area of state	Soil test for phosphorous (ppm)				
		Very low 0-5	Low 6-12	Medium 13-25	High 26-50	Very high >50
		pounds per acre of P ₂ O ₅				
New seeding						
Irrigated	Entire	90-120	70-90	50-70	0-50	None
Nonirrigated	Eastern	80-100	60-80	40-60	0-40	None
	Western	60-80	40-60	20-40	0-20	None
Established stand						
Irrigated	Entire	90-110	60-90	40-60	0-40	None
Nonirrigated	Eastern	60-80	40-60	30-40	0-30	None
	Western	40-60	30-40	0-30	None	None

POTASSIUM MANAGEMENT

High removal by the crop (60 lbs/ac per ton forage/ac)

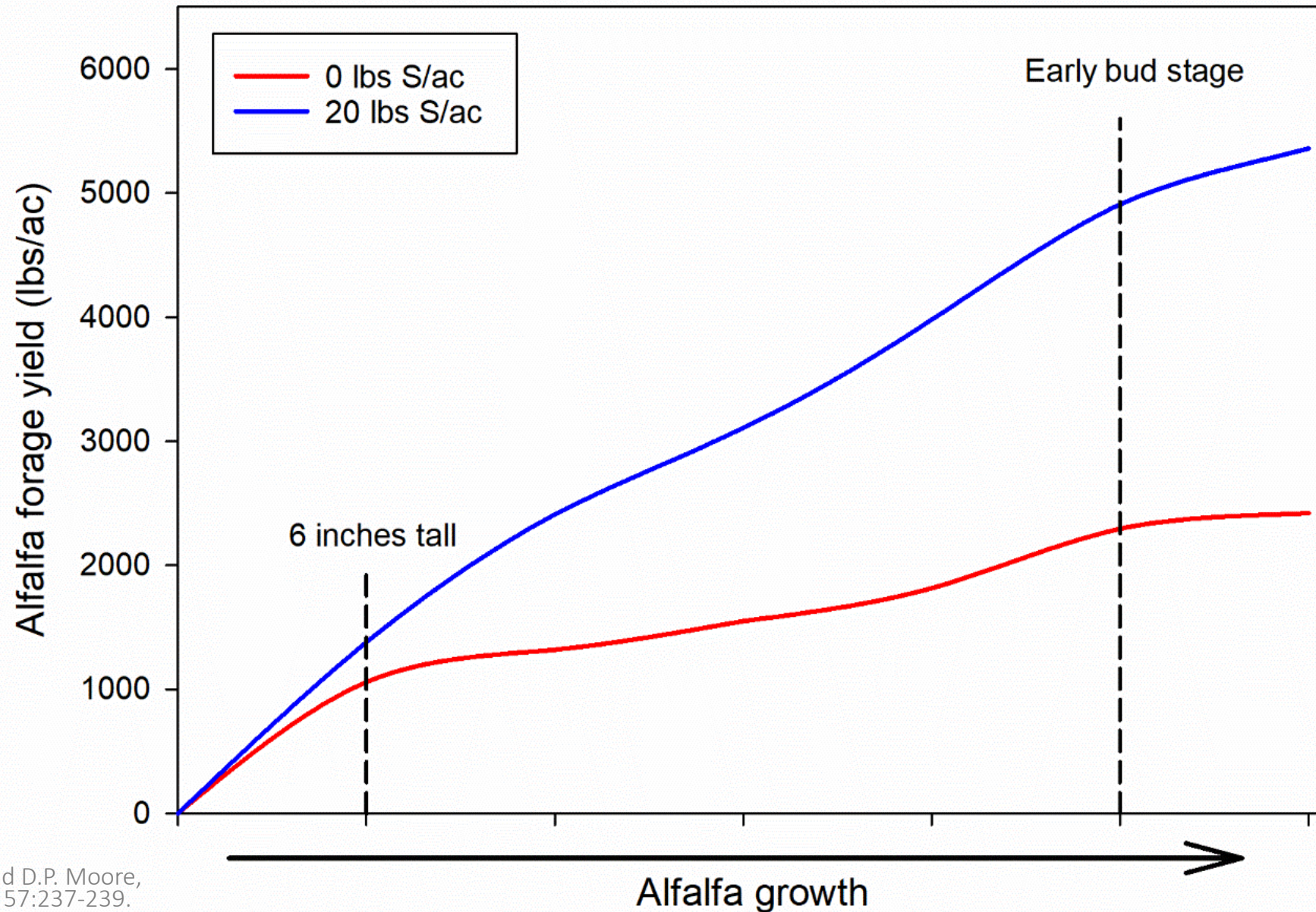
High K levels in soils – need to soil test.

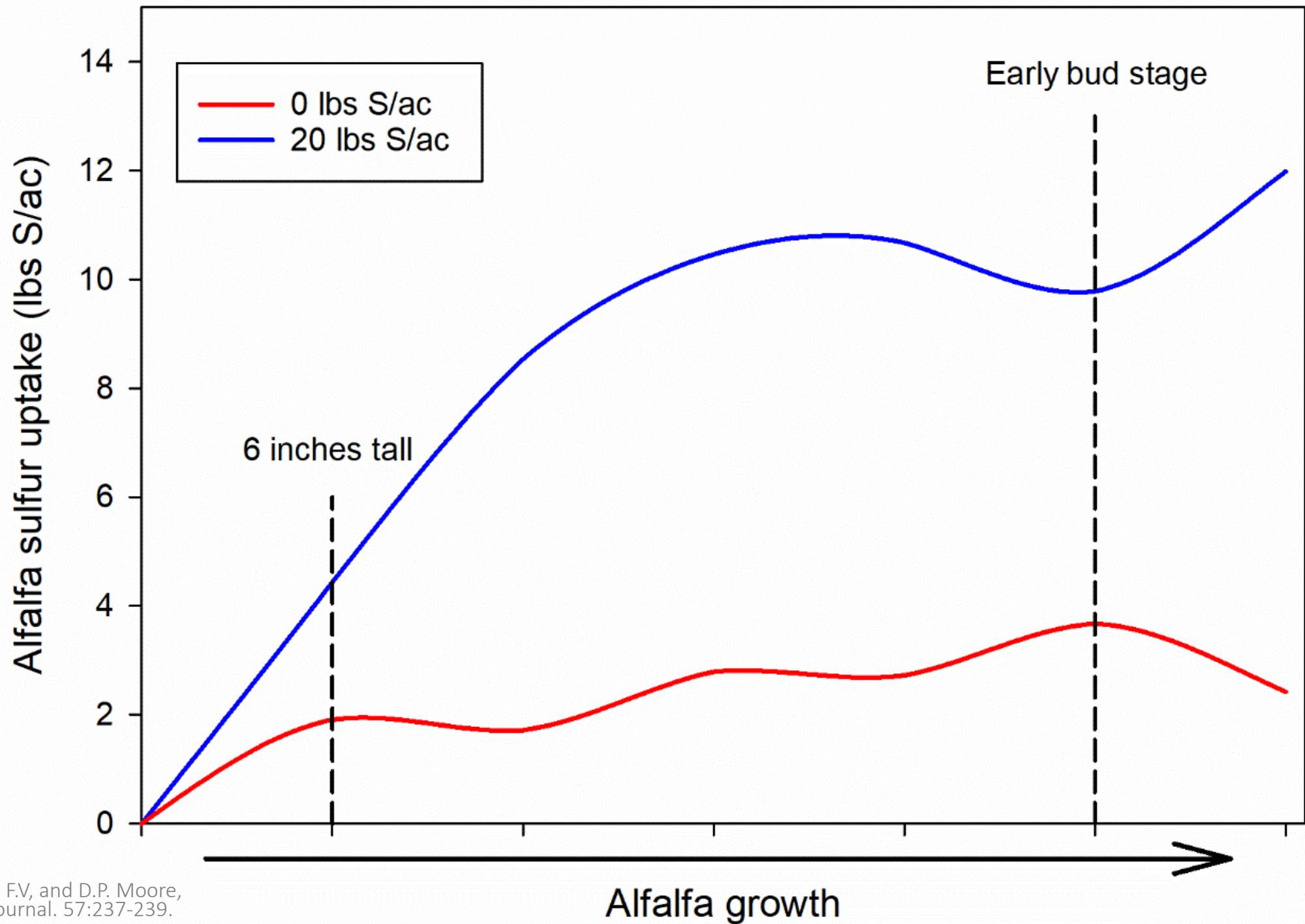
Broadcast pre-plant or existing stands fall or early spring.

Table 3. Potassium Recommendations for Alfalfa

Condition	Area of state	----- Soil test for potassium (ppm) -----				
		Very low 0-40	Low 41-80	Medium 81-120	High 121-160	Very high >160
pounds per acre of K ₂ O						
New seeding						
Irrigated	Entire	100-140	80-100	50-80	0-50	None
Nonirrigated	Entire	100-120	70-100	40-70	0-40	None
Established stand						
Irrigated	Entire	100-120	70-100	50-70	0-50	None
Nonirrigated	Entire	90-120	60-90	40-60	0-40	None

SULFUR MANAGEMENT





Take home: 2020 freeze

- Many growers did not control weevils due to:
 - (i) unsure about yield potential after freeze
 - (ii) timing “close to” termination of feed window (mid May)
- Potential for:
 - (i) direct effects (reduction of last year’s yield)
 - (ii) carryover losses (reduction of subsequent year’s yields)
- Recommendations: reduce other potential stresses to the crop
 - (i) proper fertility,
 - (ii) proper cutting management



QUESTIONS?

Romulo Lollato, Ph.D.

Assistant Professor, Extension Wheat and Forages Specialist

Kansas State University

lolato@ksu.edu



@KSUWheat



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