



ALFALFA MANAGEMENT

Insects and diseases

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Alfalfa weevil life cycle

Photo: KSU Entom.



Laying eggs
Fall and spring
Yellow at first
Orange-yellow



Photo: KSU Entom.

Adult:

Light brown snout beetle
Spring, early summer, fall

Photo: OSU Entom.



Larvae:

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

300° F GDD
(~180 °F from
January 1st?)

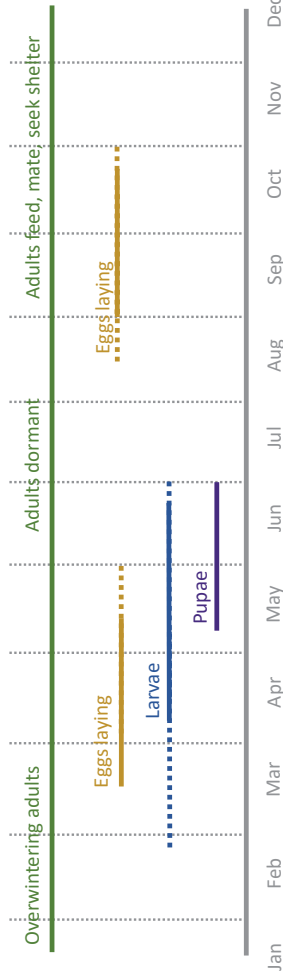
Photo: Univ. IL

Feed until
~750° F GDD
(3-4 weeks)



Pupating in cocoon
10-12 days

Alfalfa weevil life cycle



What does this look like in Kansas (Osborne)?

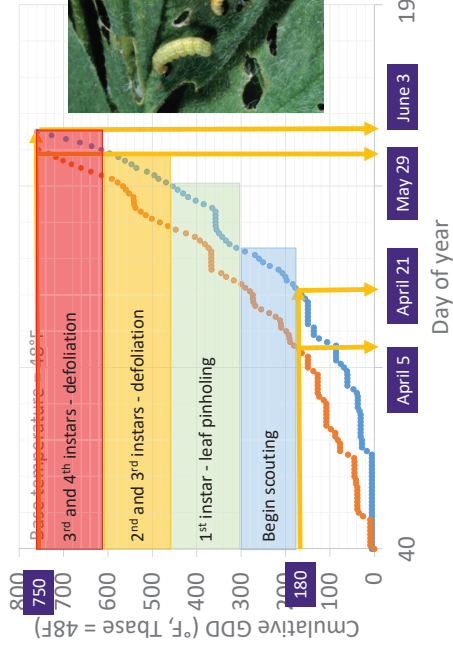


Photo: Purdue Entom.



Economic damage from alfalfa weevil

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



Photos: KSU Entom.

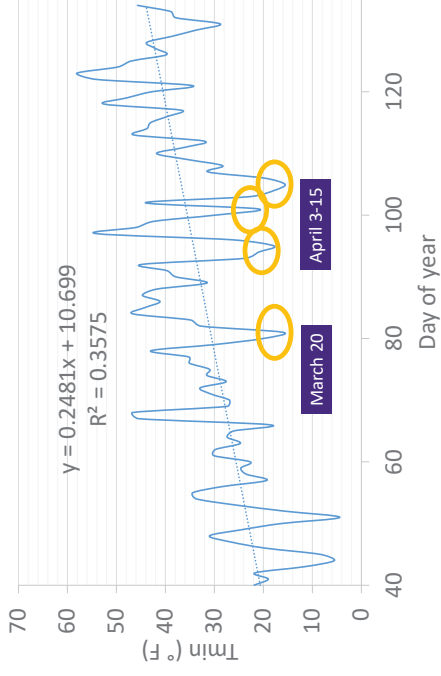
Economic damage from alfalfa weevil

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



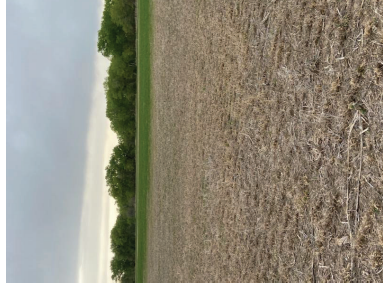
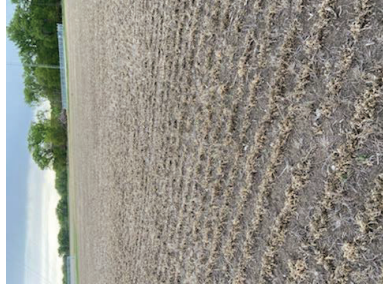
Photos: KSU Entom.

What happened in 2020?



Images: Romulo Lollato

Alfalfa in Rooks Co (early May 2020)



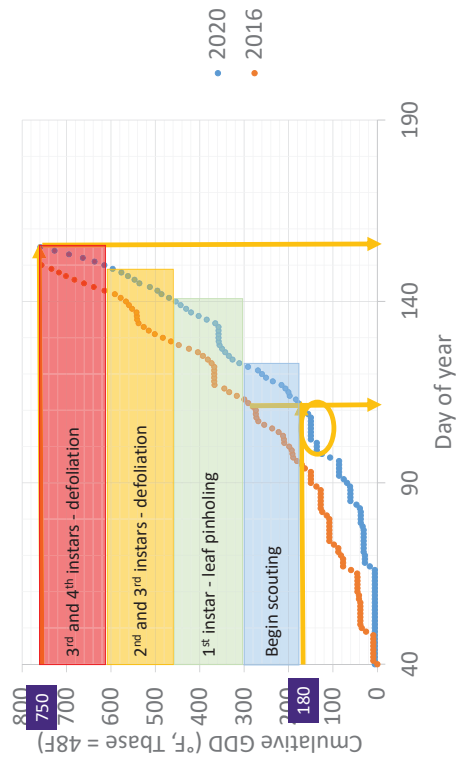
Images: Cody Miller

Alfalfa in Phillips Co (early May 2020)



Images: Cody Miller

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

KSU MF918

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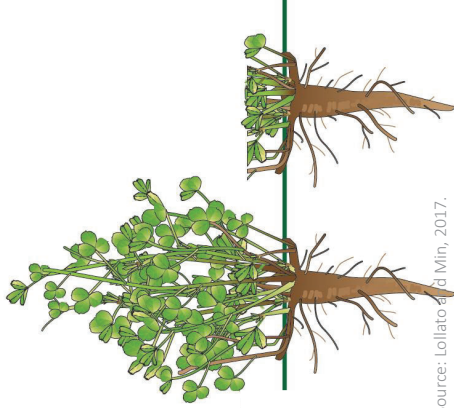
CUTTING MGT. FOR WINTER SURVIVAL

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.

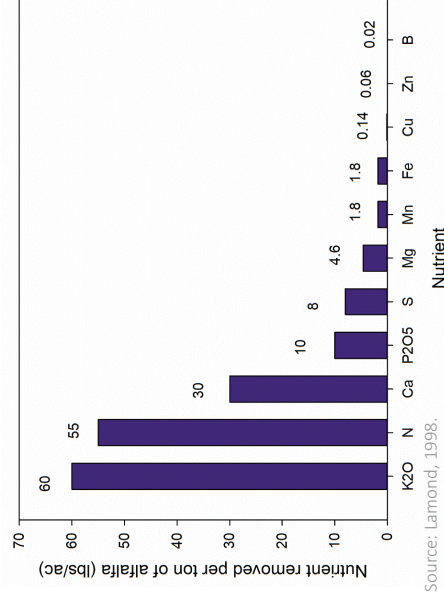
Adequate K levels increase chances of winter survival.



Source: Lollato and Min, 2017.

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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

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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
New seeding Irrigated Nonirrigated	Entire Eastern Western	90-120	70-90	50-70	0-50	None
		80-100 60-80	60-80 40-60	40-60 20-40	0-40 0-20	None None
Established stand Irrigated Nonirrigated	Entire Eastern Western	90-110 60-80 40-60	60-90 40-60 30-40	40-60 30-40 0-30	0-40 0-30 None	None None None

Source: Lamond, 1998.

POTASSIUM MANAGEMENT

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

High K levels in soils – need to soil test.

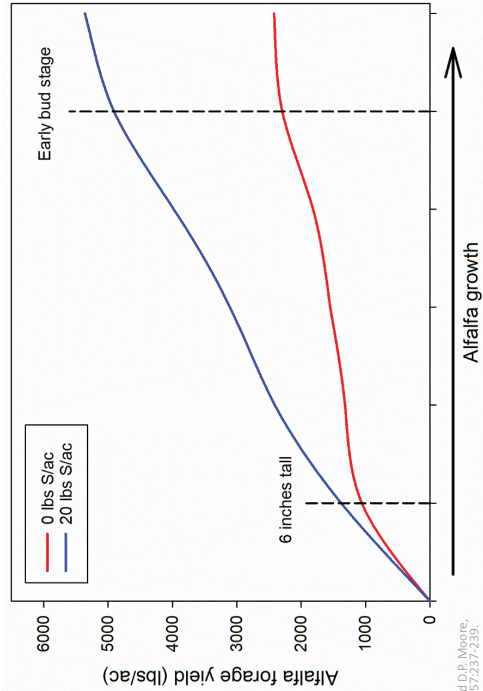
Broadcast pre-plant or existing stands fall or early spring.

Table 3. Potassium Recommendations for Alfalfa

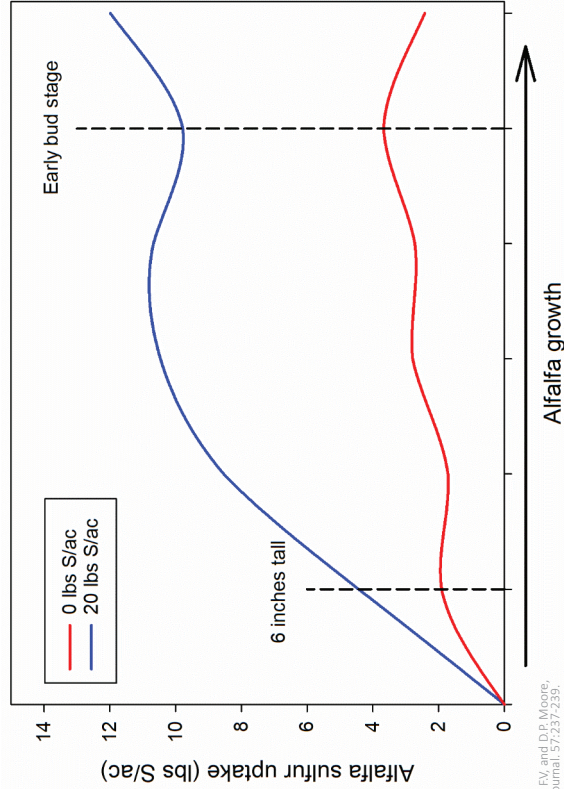
Condition	Area of state	Soil test for potassium (ppm)				
		Very low 0-40	Low 41-80	Medium 81-120	High 121-160	Very high >160
New seeding Irrigated Nonirrigated	Entire	100-140	80-100	50-80	0-50	None
		100-120	70-100	40-70	0-40	None
Established stand Irrigated Nonirrigated	Entire	100-120 90-120	70-100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

Source: Lamond, 1998.

SULFUR MANAGEMENT



Source: Pumphrey, F.V. and D.P. Moore, 1965. Agronomy Journal, 57:237-239.



Source: Pumphrey, F.V. and D.P. Moore, 1965. Agronomy Journal, 57:237-239.

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?

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