

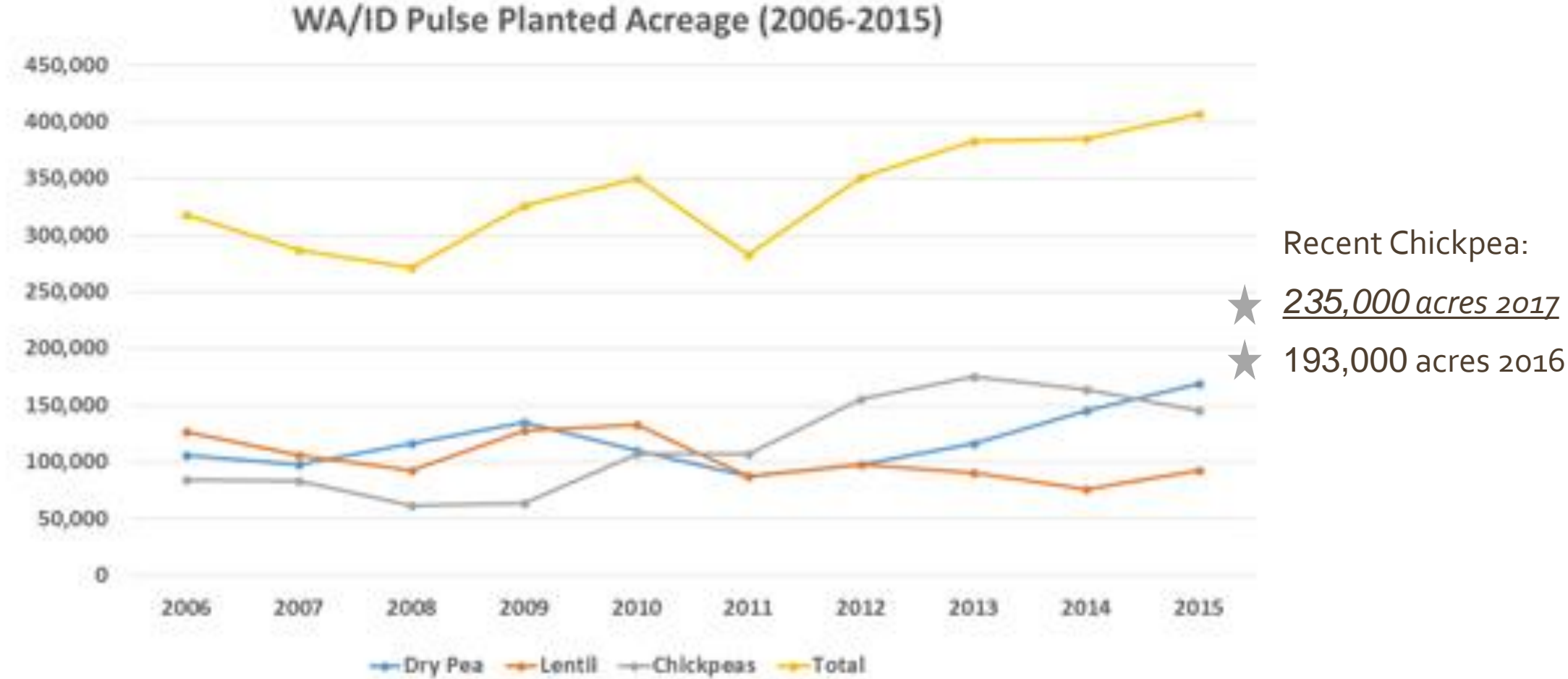


# Managing Chickpea DISEASES & WEEDS

# The History – Garbs on the Palouse

- 1981 first commercial garbs; '82 ~500 acres to ~12000 in '87
- Varieties out of Mexico or California (UC-Davis UC varieites)
- 1984-86 Ascochyta Blight appeared and caused drastic crop damage and yield loss throughout the Palouse in 1987 due to summer rains and cropping practices
- Moratorium; by 1991 impact was significantly reduced.

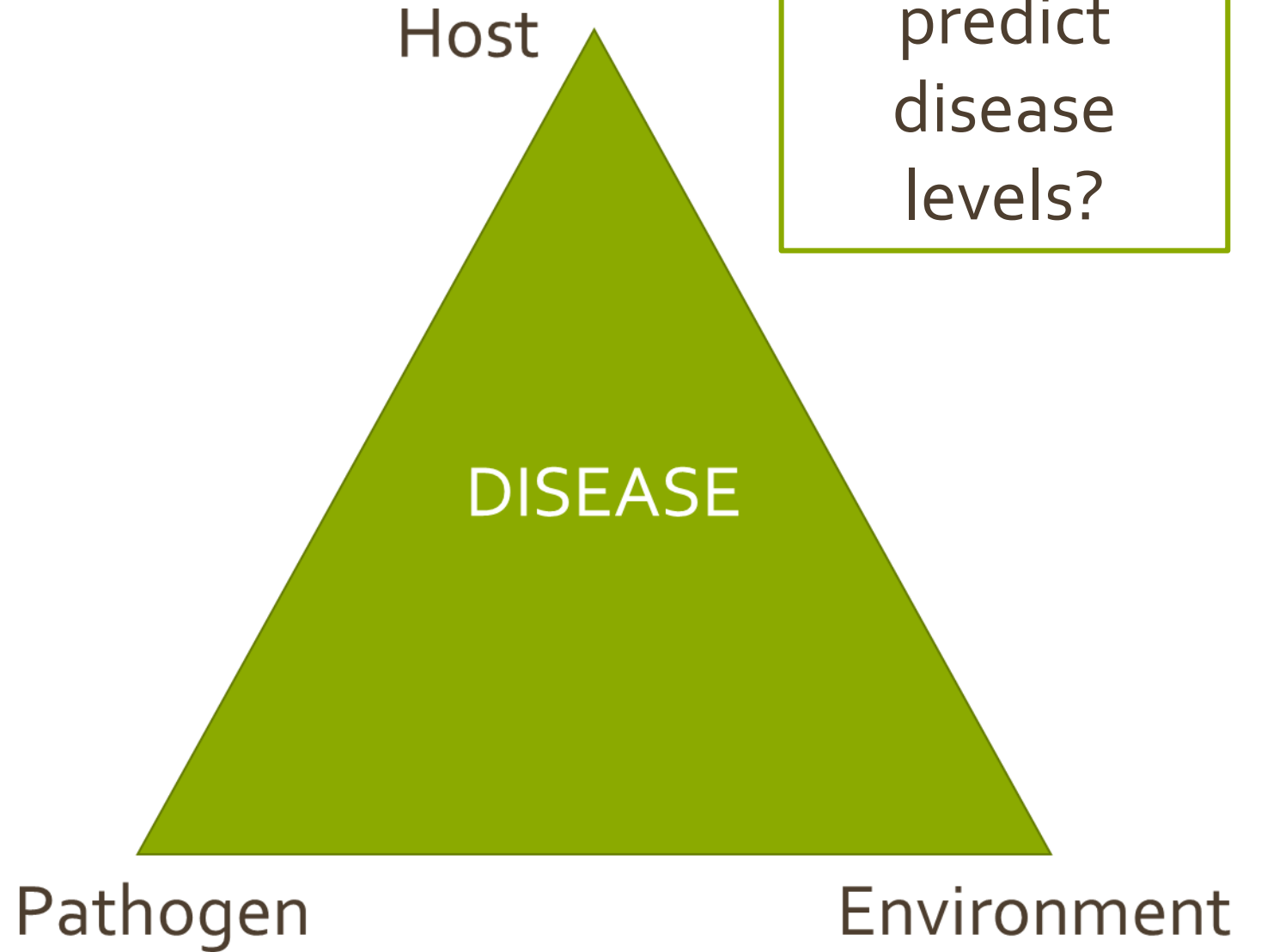
# Recent Pulse Acreage growth





## Diseases of Note

- Fusarium
- Rhizoctonia
- Ascochyta Blight
- Pythium
- Luteovirus



# Fusarium Wilt

- Affected plants yellow, wilt, and prematurely dry
- Finer roots die, taproot becomes necrotic



Figure 10. Root symptoms of Fusarium wilt showing vascular discoloration with no external rot on plant (top) compared with healthy plant on bottom.

## *Rhizoctonia solani*

- Common in very moist soils
- Rotted, discolored tissues
- Sclerotia and mycelium facilitate continued infection and disease survival
- Found early in season



Figure 13. Severe tip rot infection due to *Rhizoctonia solani*, showing the soft, wet rot of taproot.



Figure 11. Young chickpea root infected with *Rhizoctonia solani*, causing tip rot.



# Luteovirus

- “yellowing viruses”
- High levels seen in 2014
- Pea aphid can vector many viruses; Bean leafroll virus (BLRV), Pea enation mosaic virus (PEMV), and Pea streak virus (PeSV)
- Yellowing at leaf margins, necrotic phloem. Folded up along mid-veins.
- Dimethoate!





# Ascochyta Blight – *Phoma rabiei*

- Selectively attacks chickpea; persists in residue, seed, and volunteers
- Seed or wind and rain-borne causalities; all parts above soil line susceptible.
- Lesions girdle stems, weaken/drop branches, killing plant material above lesion.
- Host specific – *Cicer arietinum*



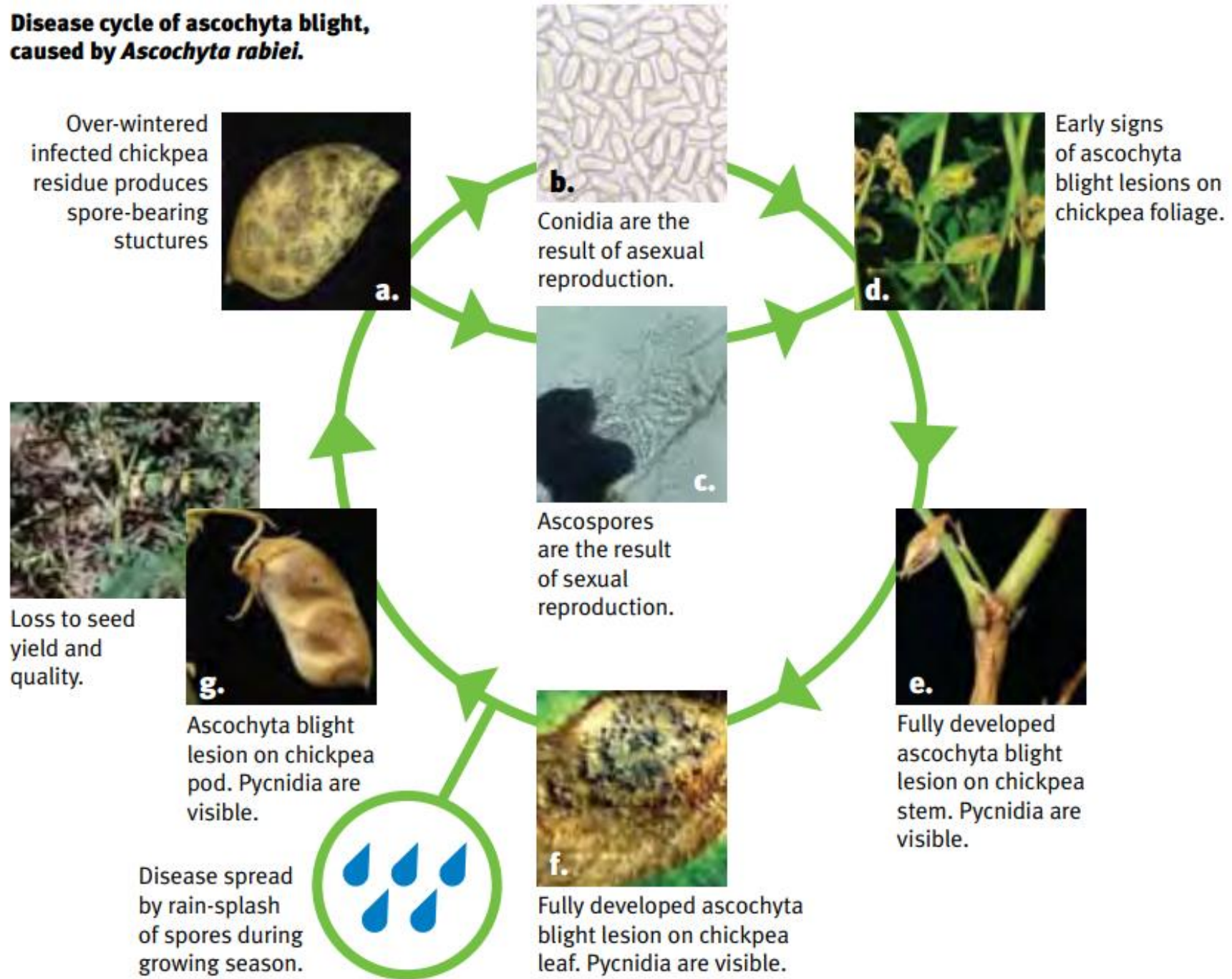


# Ascochyta Blight– how it works

- Sexual & Asexual reproduction
    - Sexual - ascospores/pseudothecium
    - Asexual – conidia/pycnidium
1. Ascospores are produced on chickpea residue
  2. Abiotic/biotic movement of ascospore
  3. Conidia initiate secondary infection from plant to surrounding



**Disease cycle of ascochyta blight, caused by *Ascochyta rabiei*.**









# Misdiagnosis of injury

- Examples of herbicide damage











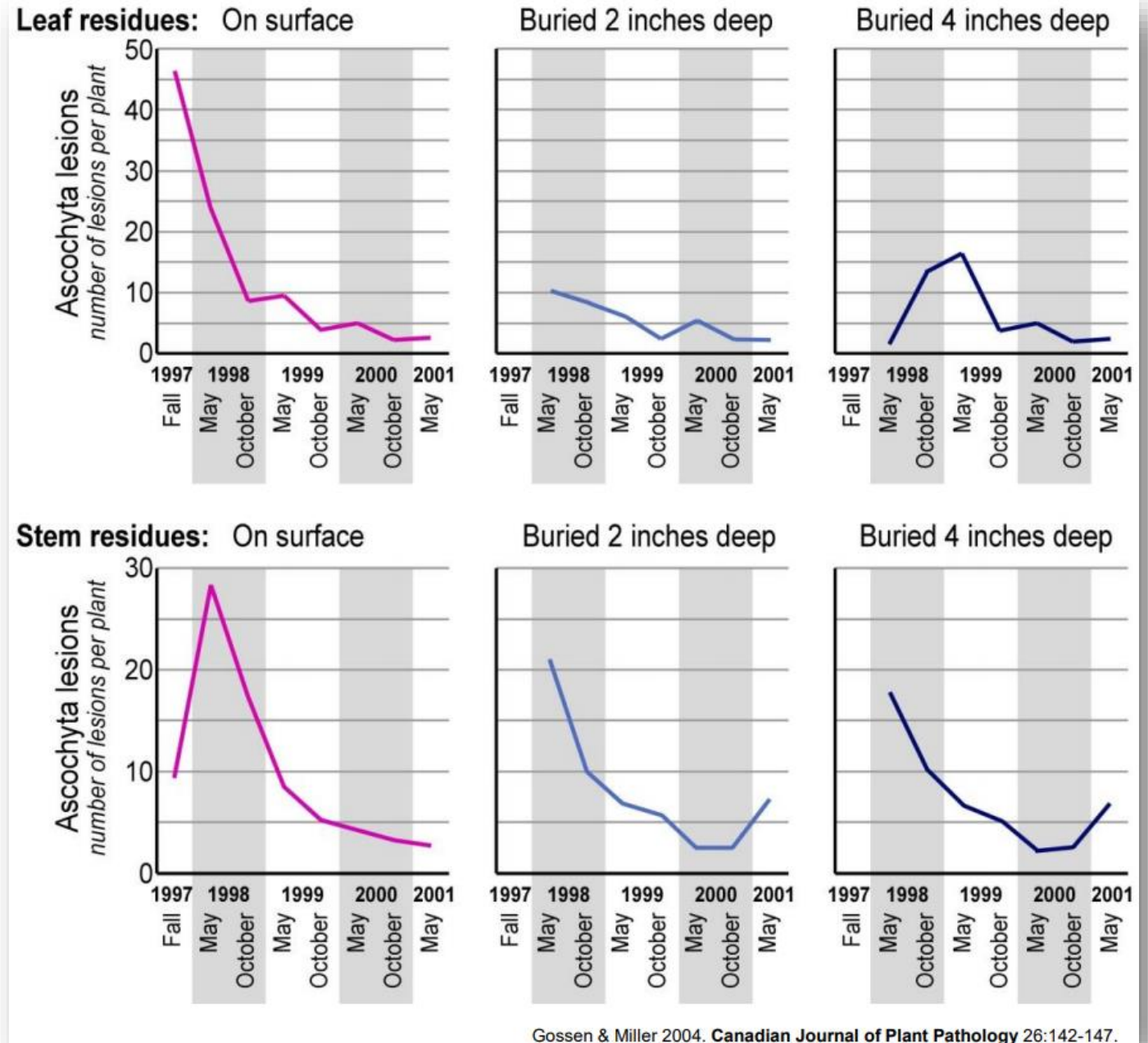


# Ascochyta Control – Cultural

- Seed; brown bagging hurts all of us
- Variety selection; Billy's have greatest available resistance levels
  - Seed treatments – thiabendazole
- Seeding; warm soil (Billy's 46 F, Large garbs 52 F), proper depth (3-4 in), proper plant population
- Crop rotation; NO GARB ON GARB, don't plant in adjacent fields (ascospores capable of long distance transport), three year rotation.
- Watch the weather; seeding dates
- Mechanical controls? – tillage; bury/destroy crop residue... clean equipment to limit pathogen/plant residue transfer

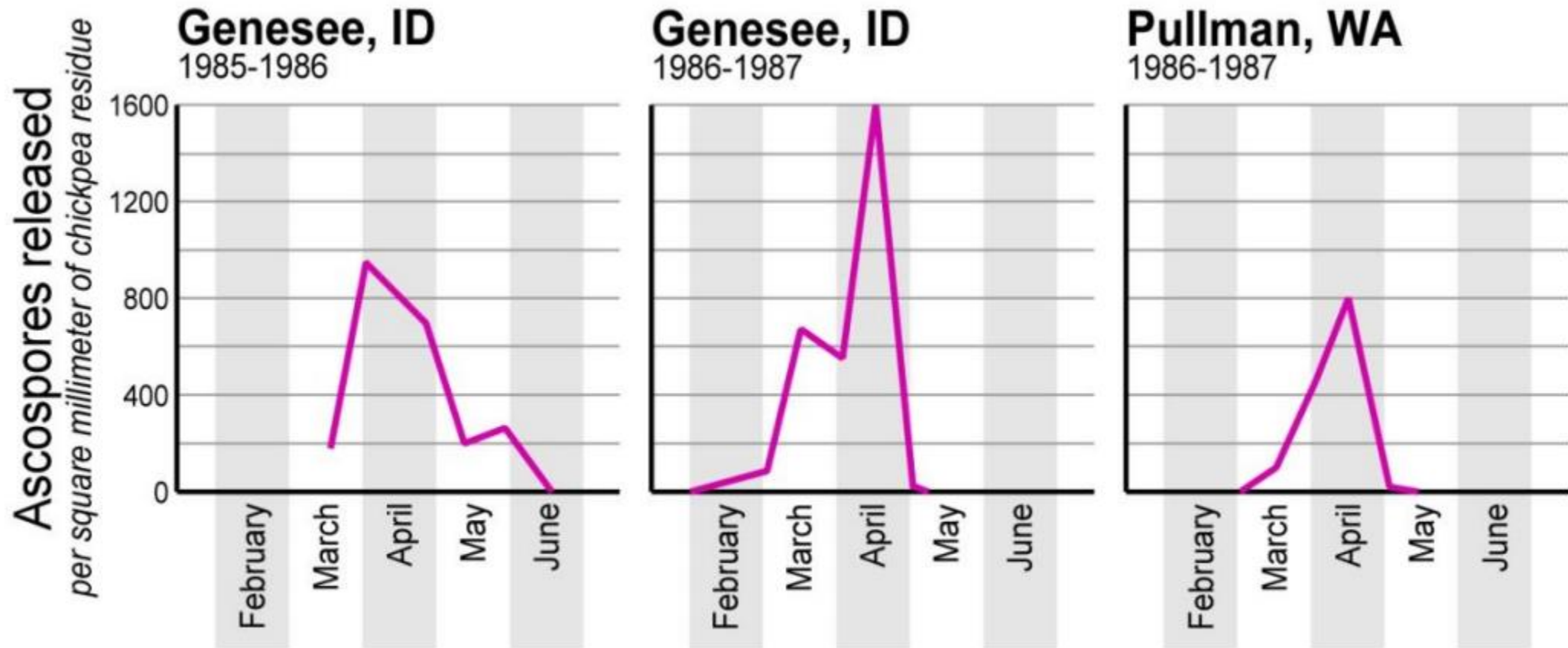
# Impact of Crop Rotation

- Graphs represent average number of *Ascochyta* lesions that developed on chickpea seedlings inoculated with chickpea residues from a diseased field site (heavy clay soils) near Saskatoon.
- Transmission of *Ascochyta* from infested chickpea leaf and stem residues to new chickpea plants may occur for at least 4 years!





# Ascospore Release From Overwintered Infested Chickpea Residues



Trapero-Casas & Kaiser 1992. *Phytopathology* 82:1261-1266.

# Ascochyta Control – Chemical

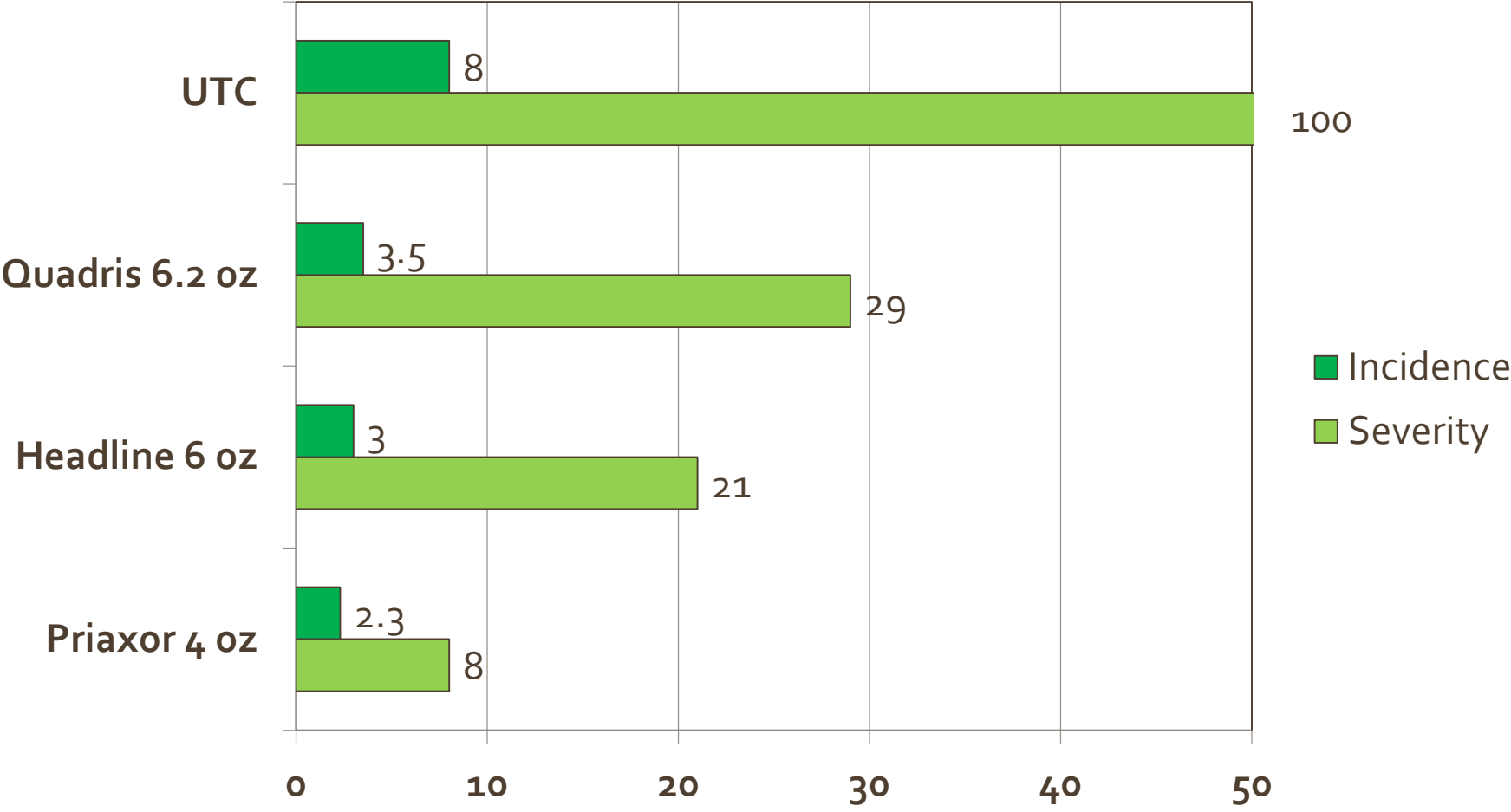
- Fluxapyroxad + Pyraclostrobin (**Priaxor**) 4-8oz
- Chlorothalonil (**Bravo**) 1.38-2 pt/A
- Difenoconazole + Benzovindiflupyr (**Aprovia Top**) 10.5-11 fl oz/A
- Prothioconazole (**Proline 480 SC**) 5-5.7 fl oz/A
- Prothioconazole + Trifloxystrobin (**Delaro**) 12 fl oz/A





# Chickpea Ascochyta Blight Trial

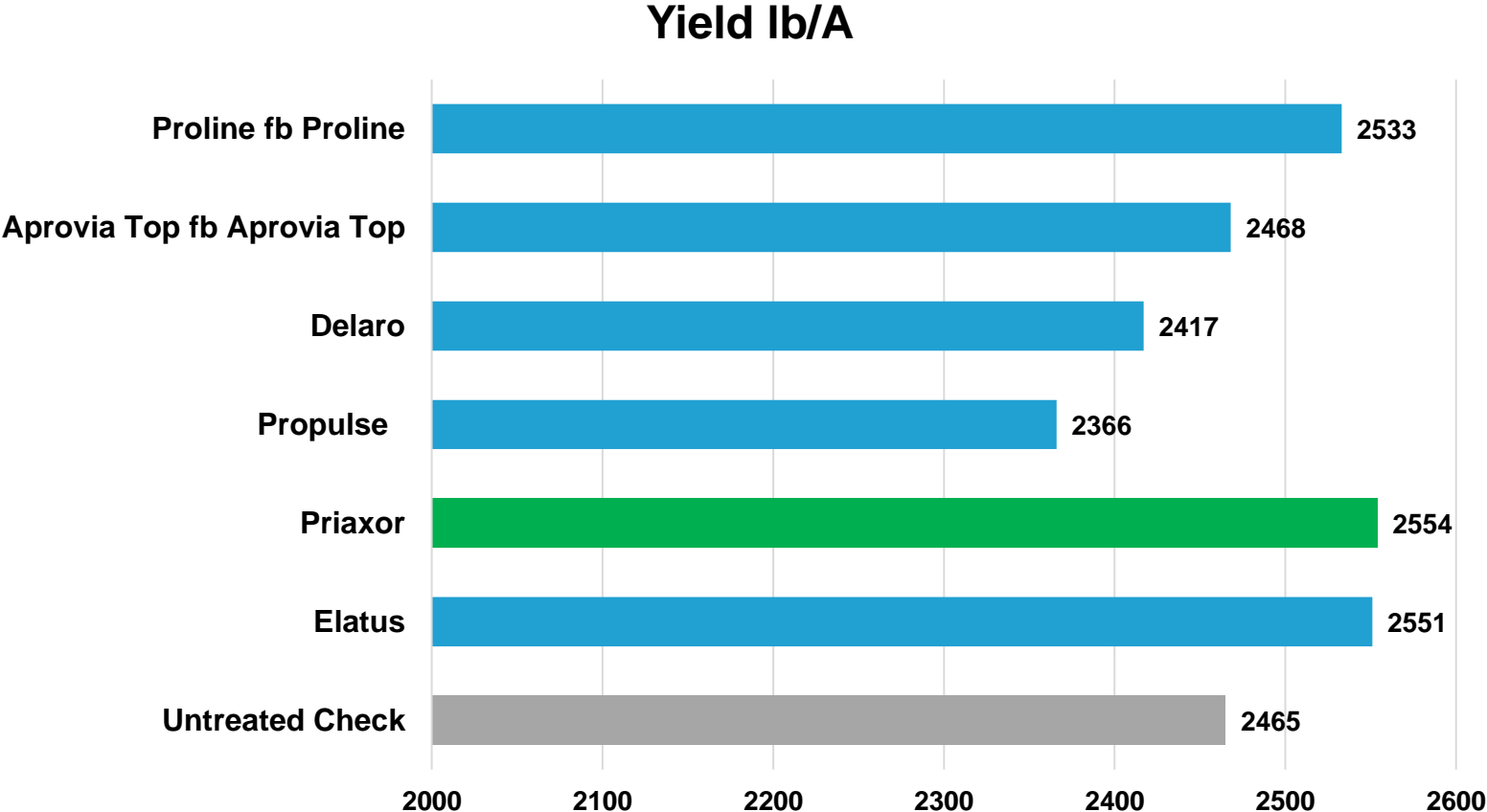
Dr. Weidong Chen, WSU, Pullman, WA



Ratings 7/28/2011

# Chickpea Ascochyta Blight Trial

2017 Sidney, MT EARC Frankie Crutcher

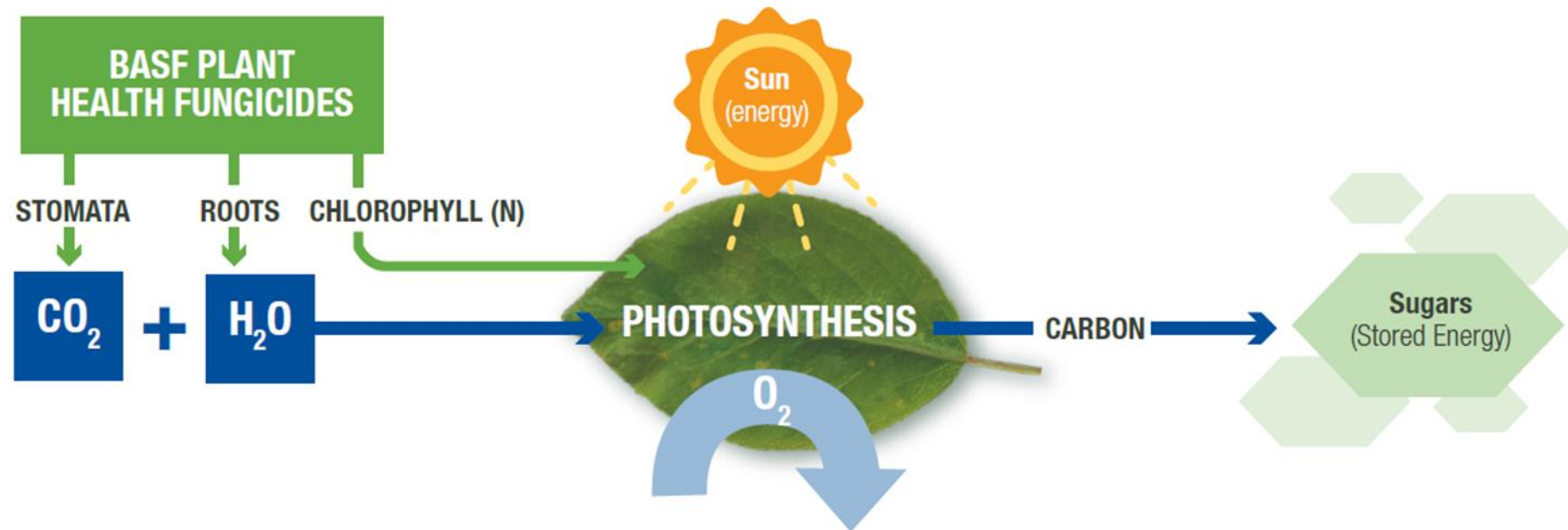


Chickpea variety Sierra was planted on 4/21/2017 under irrigation. Application A applied on 6/28, application B applied on 7/12, application C applied on 7/25. Delaro 12 fl oz/A, Propulse 8.6 fl oz/A, Priaxor 6 fl oz/A, Elatus 4.76 oz/A, Proline 5.7 fl oz/A, Aprovia Top 11 fl oz/A. All treatments included NIS @ 0.25% v/v. Disease severity was very low due to extreme drought, even under irrigation.





# Fungicide Greening Effect?



# Chickpea Herbicides

- **Broadleaf control**
  - Valor, Sharpen, Spartan, Prowl, Sencore, and Pursuit
- **Grass herbicides**
  - Poast, Assure II, or Select Max (Clethodim)

# Weeds and what to do with them;

## **Option 1.) Chickpeas (Late March – to Mid April Seeding Window)**

- Pre-plant - Consider 1-2 oz. of Sharpen pre-plant with the Roundup
- Post-plant/ Pre-emerge 1-2 oz. Sharpen, 1 oz. Valor and 4-6 oz. Sencore

## **Option 2.) Chickpeas (Late April – to Mid May Seeding Window)**

- Pre-plant - Consider 1-2 oz. of Sharpen pre-plant with Roundup
- Post-plant/Pre-emerge 1-2 oz. Sharpen and 6 oz. Sencore

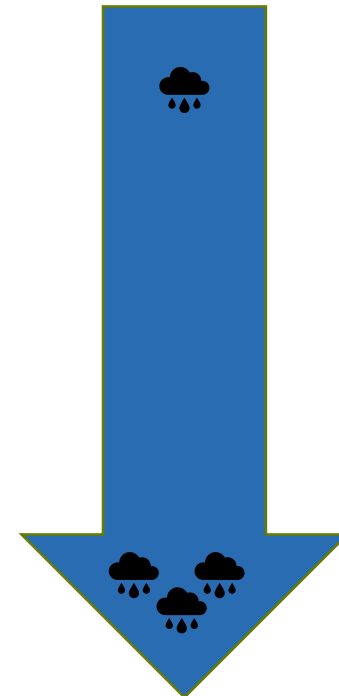
## **Option 3.) No-till option**

- Pre-plant - Consider 6 oz. Spartan pre-plant with Roundup instead of sharpen



Common Name	Trade Name(s)	Site of Action	Water Solubility <i>mg/L</i>
saflufenacil	Sharpen <sup>®</sup>	14	2100
metribuzin	Sencor <sup>®</sup>	5	1100
S-metolachlor	Dual II Magnum <sup>®</sup> Sequence <sup>®</sup> BroadAxe <sup>®</sup>	15	488
sulfentrazone	Spartan <sup>®</sup> Spartan Charge <sup>®</sup> BroadAxe <sup>®</sup>	14	110
linuron	Lorox <sup>®</sup>	7	75
flumioxazin	Valor <sup>®</sup>	14	1.79
pendimethalin	Prowl H2O <sup>®</sup>	3	0.3

Rainfall for  
Activation





CNFA

# JOHN OGWONOWSKI AND DOUG BEREUTER FARMER-TO- FARMER PROGRAM

*Albert Radloff,  
Integrated Pest Management Specialist*













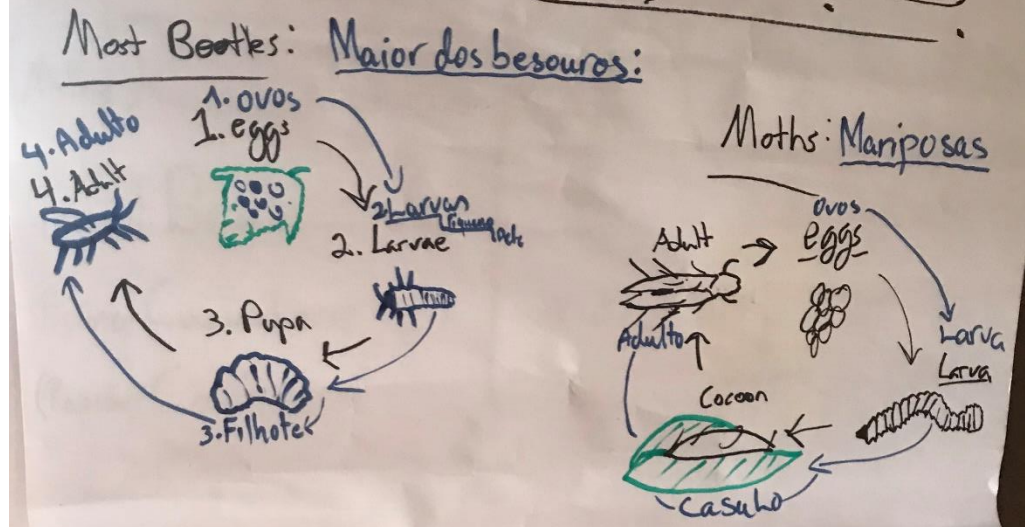
# Planta e linha espaçamento Crop Row Spacing

Seed → Depth	Sementes profundidade Plant Spacing Planta espaçamento	Row Spacing Linha espaçamento
(Milho) Corn ⇒ 3-4cm	15-20cm	60-75cm
(Feijão) Beans ⇒ 2.5	5	40-60
(Pipino) Cucumber ⇒ 3	30-60	60
(Repolho) Cabbage ⇒ 3	30cm	60
(Cebola) Onion ⇒ 2.5-5	5-7	30-45
(Tomate) Tomato ⇒ 1cm	45-60	60-75
(Pimento) Pepper ⇒ 1	45-60	60
(Quiabo) OKra ⇒ 2-3	20-30	60
(Alface) Lettuce (Leaf) ⇒ 1-1.5	5-10	30-40



- Onion ajuda tomato, pepper, lettuce, cabbage ⇒ Repels spiders, beetles, bugs
- Milho ajuda Feijão Pipino ⇒ milho fornece estrutura / beans for nitrogen / cucumber = weed control
- Corn, bean, cucumbers ⇒ corn structure / beans for nitrogen / cucumber = weed control
- Pimentos assustam besouros de Quiabo ⇒ Peppers scare beetles from OKra
- Beans + onions don't really like each other ⇒ Feijão e cebola realmente não como um ao outro

# Ciclos de vida de insetos



(Pimento) Pepper ⇒ 1	45-60	60
(Quiabo) OKra ⇒ 2-3	20-30	60
(Alface) Lettuce (Leaf) ⇒ 1-1.5	5-10	30-40

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