Aphids & Viruses in Pumpkins

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Aphids

wingless aphids colonizing leaf

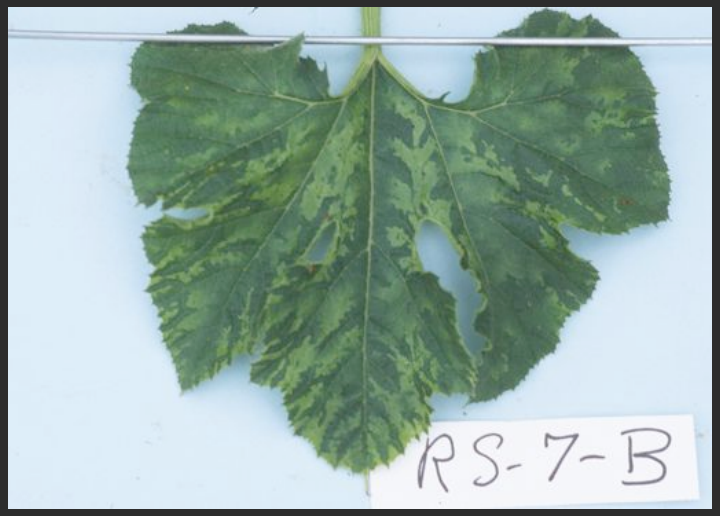
winged aphid

- fly, land, taste
- bring in virus
- often do not colonize

Ohio Pumpkin Virus Survey

	number of farms		
	'94	'95	'96
Total tested	26	27	26
Negative for all viruses	20	6	9
Positive for virus:			
Watermelon mosaic	4	18	16
Cucumber mosaic	2	8	0
Squash mosaic	3	5	3
Papaya ringspot	0	4	0
Zucchini yellows	0	0	0

Watermelon Mosaic Virus



Traps for Winged Aphids

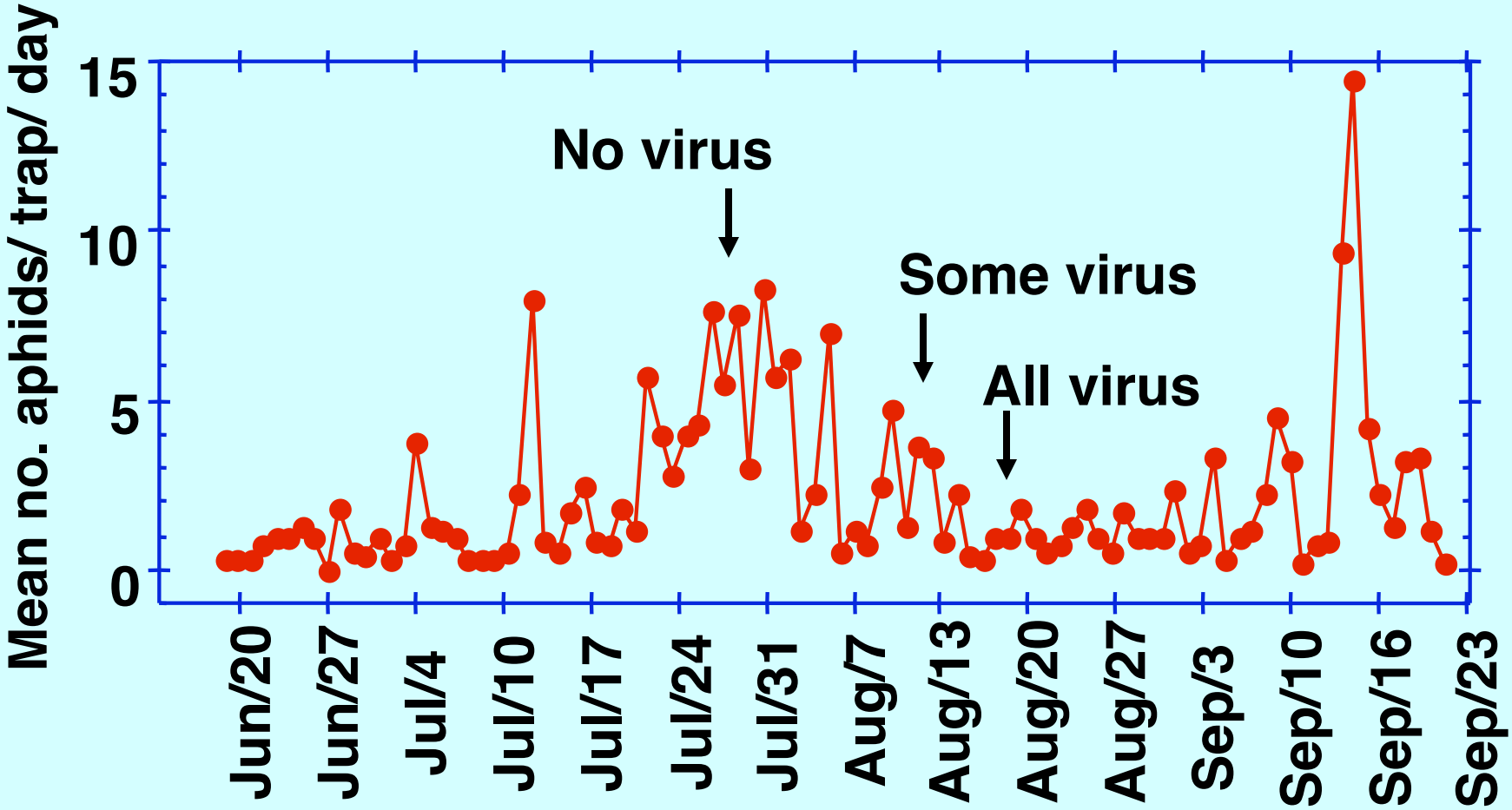
water pan trap

sticky traps,
green & yellow

Aphids & Viruses: Seasonal Occurrence in Ohio

- Winged aphids
  - Daily arrivals June - September
  - Usually a surge in late July
- Watermelon mosaic virus
  - First detection: last week July to first week August
  - Consistent over many locations & many years

Aphids in Water Pan Traps, Columbus, 1995



Aphid species landing in traps in pumpkin fields during 3 weeks before WMV symptoms detected (1995, 1996)

- **corn leaf aphid** *(Rhopalosiphum maidis)*
- **'artichoke' aphid** *(Capitophorus elaeagni)*
- **green peach aphid** *(Myzus persicae)*
- **cowpea aphid** *(Aphis craccivora)*
- **sunflower aphid** *(Aphis helianthi)*
- **potato aphid** *(Macrosiphum euphorbiae)*
- **yellow clover aphid** *(Therioaphis trifolii maculata)*
- **oleander aphid** *(Aphis nerii)*
- **turnip aphid** *(Lipaphis erysimi)*
- **'polygonum' aphid** *(Capitophorus hippophaes)*
- **melon aphid** *(Aphis gossypii)*
- **rice root aphid** *(Rhopalosiphum rufiabdominalis)*

Vector tests for watermelon mosaic virus on pumpkins

Species	% of plants infected	
	1997 (individual tests)	1998 (group tests)
green peach aphid	22%	-
melon aphid	21%	-
potato aphid	2%	18%
artichoke aphid	0%	6%
corn leaf aphid	0%	0%

Reservoirs of Watermelon Mosaic Virus

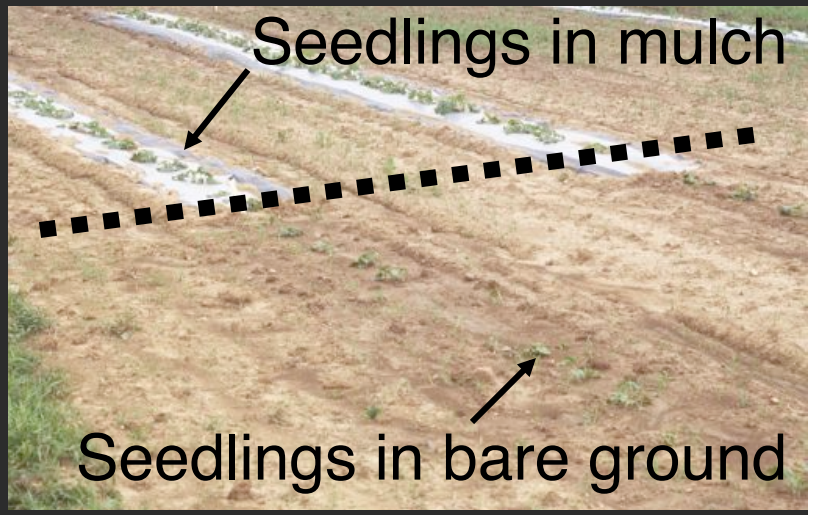
Among 47 plant species tested:

- **Most common:**
  - **Virginia pepperweed**
  - **shepherd's purse**
- **Occasional:**
  - **dandelion**
  - **field bindweed**
  - **purple (red) deadnettle**
  - **goldenrod**

Management of Aphids & WMV on Pumpkin

- Stylet oil
- Row covers
- Reflective mulch
- Soil-applied systemic insecticides
- Foliar insecticides

Reflective Mulch for Aphid/Virus Management



Theory:

- **Repels winged aphids**
- **Delays aphid colonization**
- **Delays virus infection**
- **Reduces virus symptoms**

Reflective Mulch for Aphid/ Virus Management: Trials 1995, 1996

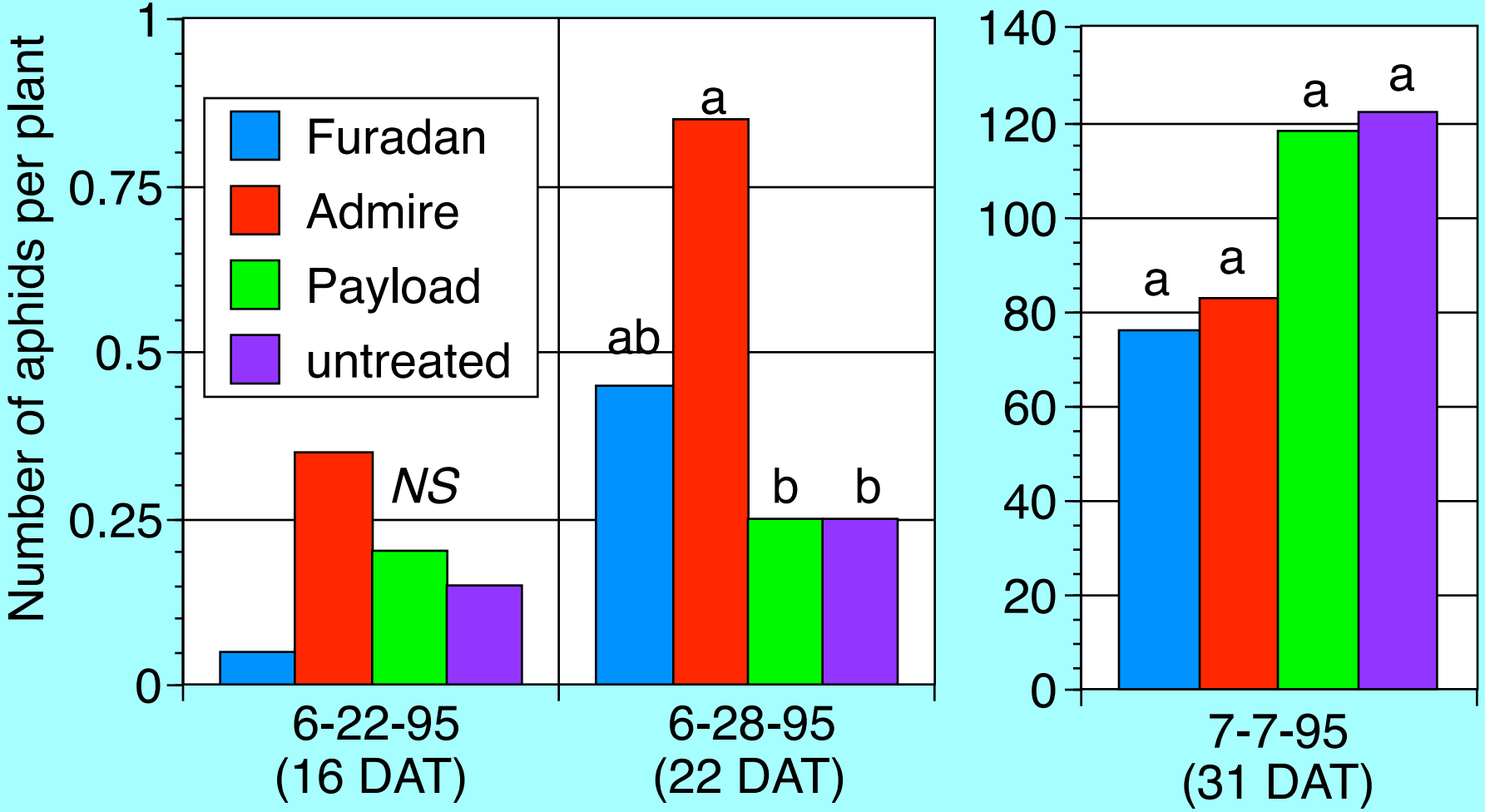
Effect on:	Result
Aphid colonization	excellent
Virus initial infection	none
Virus symptoms at harvest	none

Why? Early aphids did not bring virus; late aphids brought virus after mulch overgrown

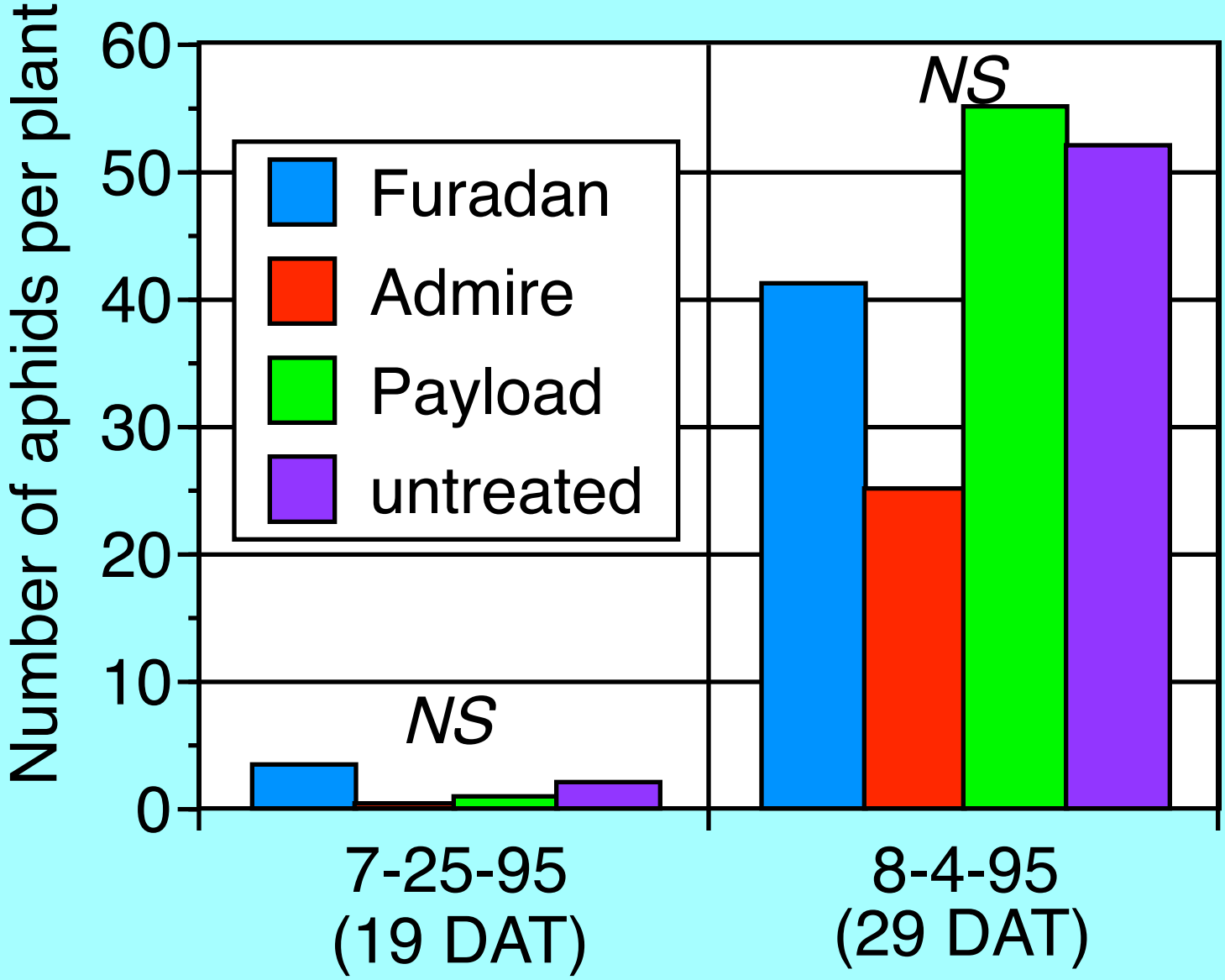
Soil systemic insecticide trials

- **4 treatments:**
  - **Furadan 4F**
  - **Admire 2F**
  - **Payload 15G** *(acephate; not registered!)*
  - **untreated check**
- **1995: apply at-planting, 2 seeding dates:**
  - **early planting**
  - **late planting**
- **1996: one seeding, 2 timings:**
  - **apply at planting**
  - **apply at vine-tip**

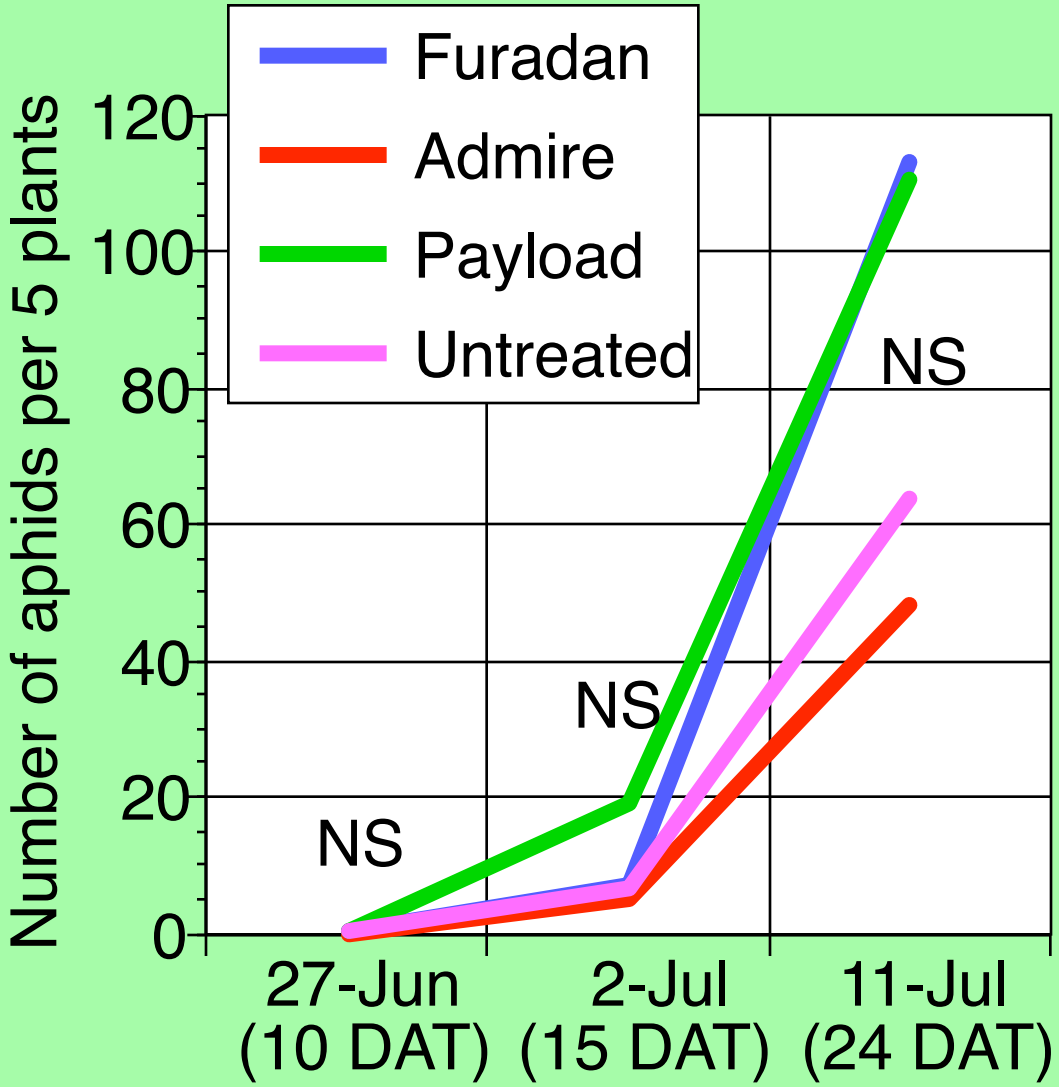
Pumpkin soil systemic insecticide trial
EARLY planting (planted 6-6-95)



Pumpkin soil systemic insecticide trial
LATE planting (planted 7-6-95)

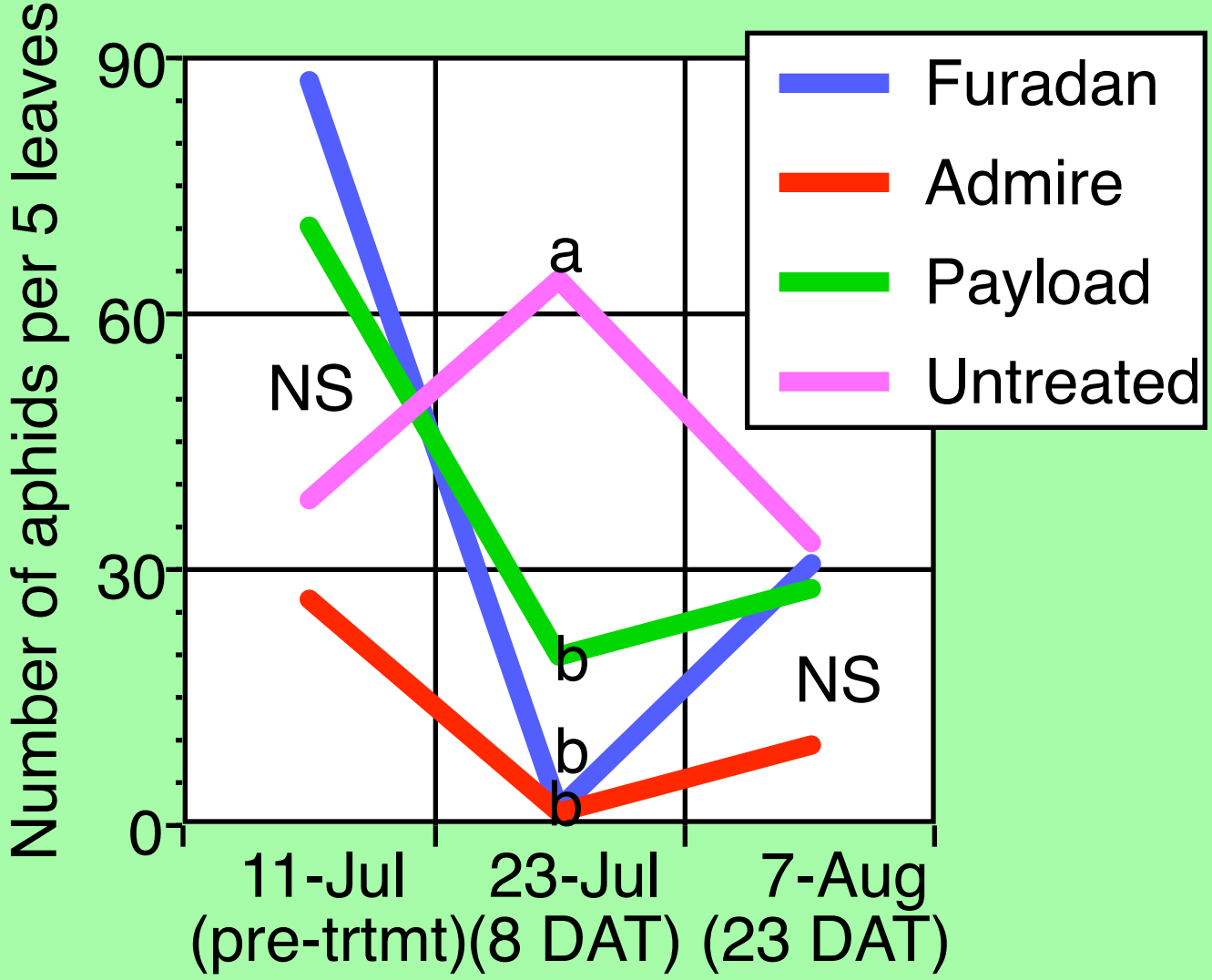


Pumpkin soil systemic insecticides, 1996
Treatments applied AT PLANTING (17 June)



***Virus*: in 1% of plants on 15-Jul.; in 99% of plants on 5-Aug.**

Pumpkin soil systemic insecticide trial, 1996
Treatments applied AT VINE TIP (15 July)



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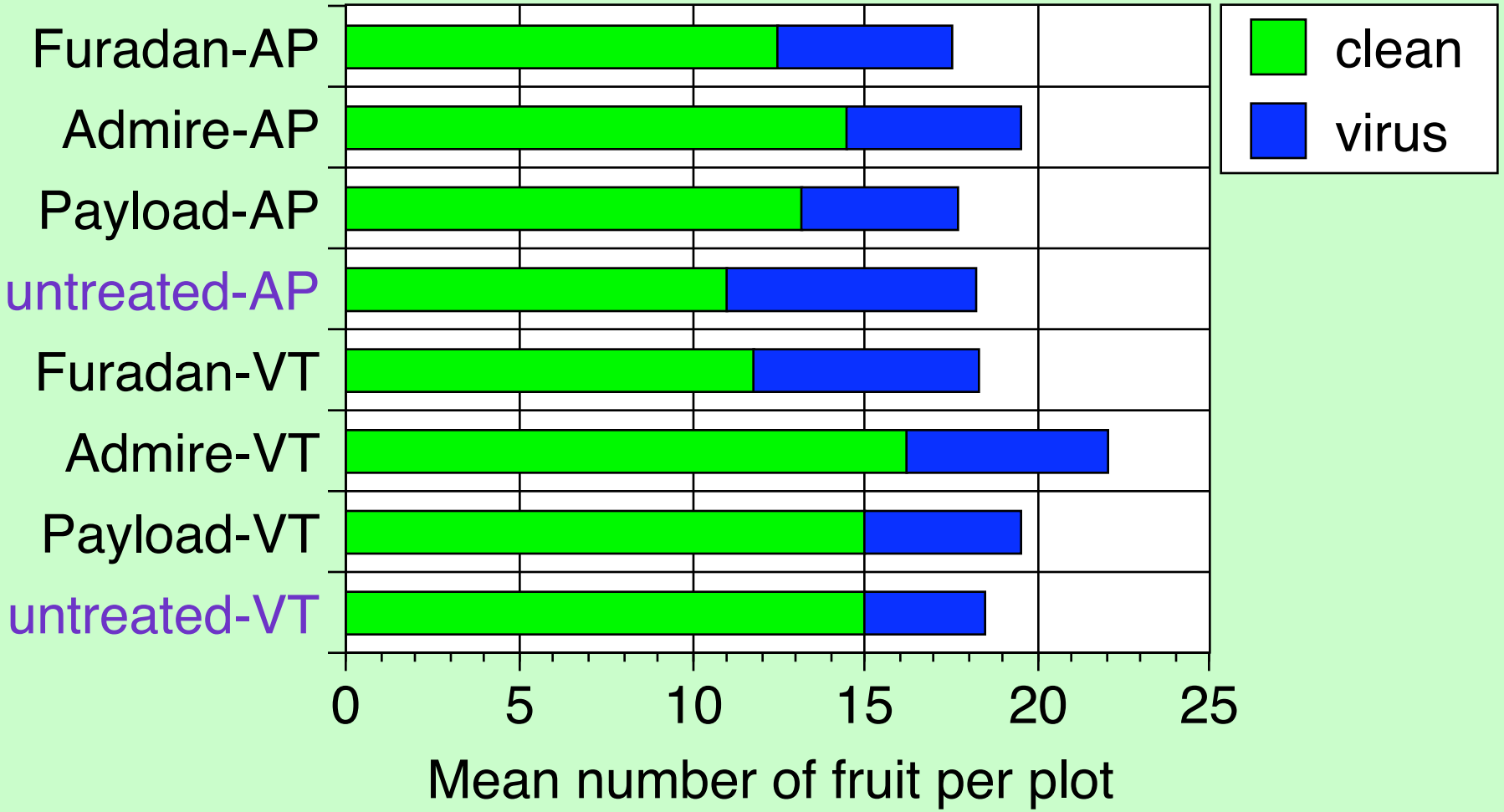
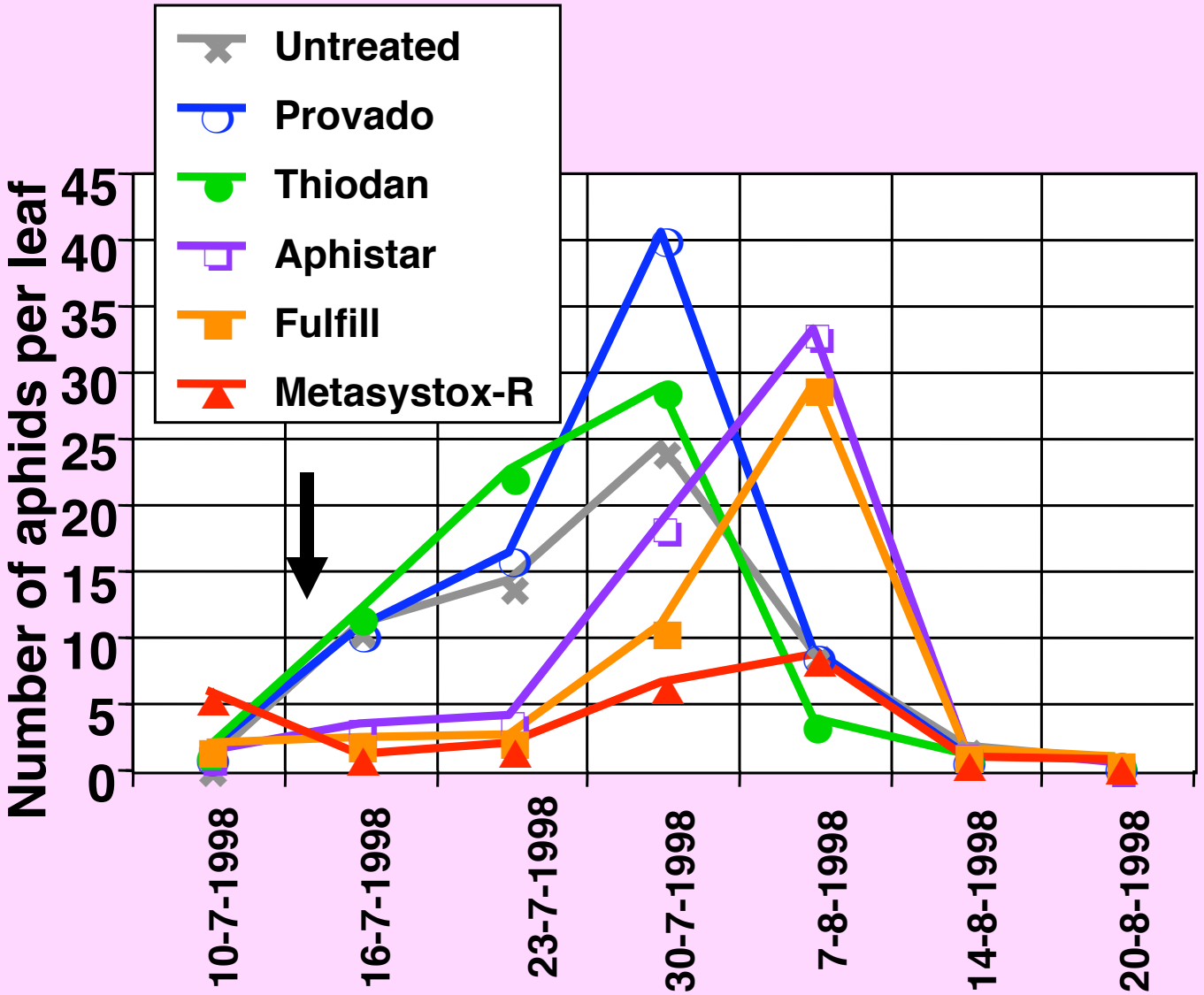
Pumpkin soil systemic insecticides, 1996
HARVEST EVALUATION



Aphicide Trial on Pumpkin, 1998



Insecticides for Aphid & Virus Management

	Effective?
• Aphid control	yes
• Primary virus infection	no
• Secondary virus spread:	
– if primary infection widespread	no
– if primary infection not widespread	maybe

Aphid/Virus Management on Pumpkins

- Best hope is resistant varieties

Acknowledgements

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  - Bob Precheur (horticulturalist)
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  - Steve Nameth (virologist)
  - Mark Schmittgen (farm manager)
  - Karen Magnuson (technician)