IPM & Avocados in Australia

Dan Papacek

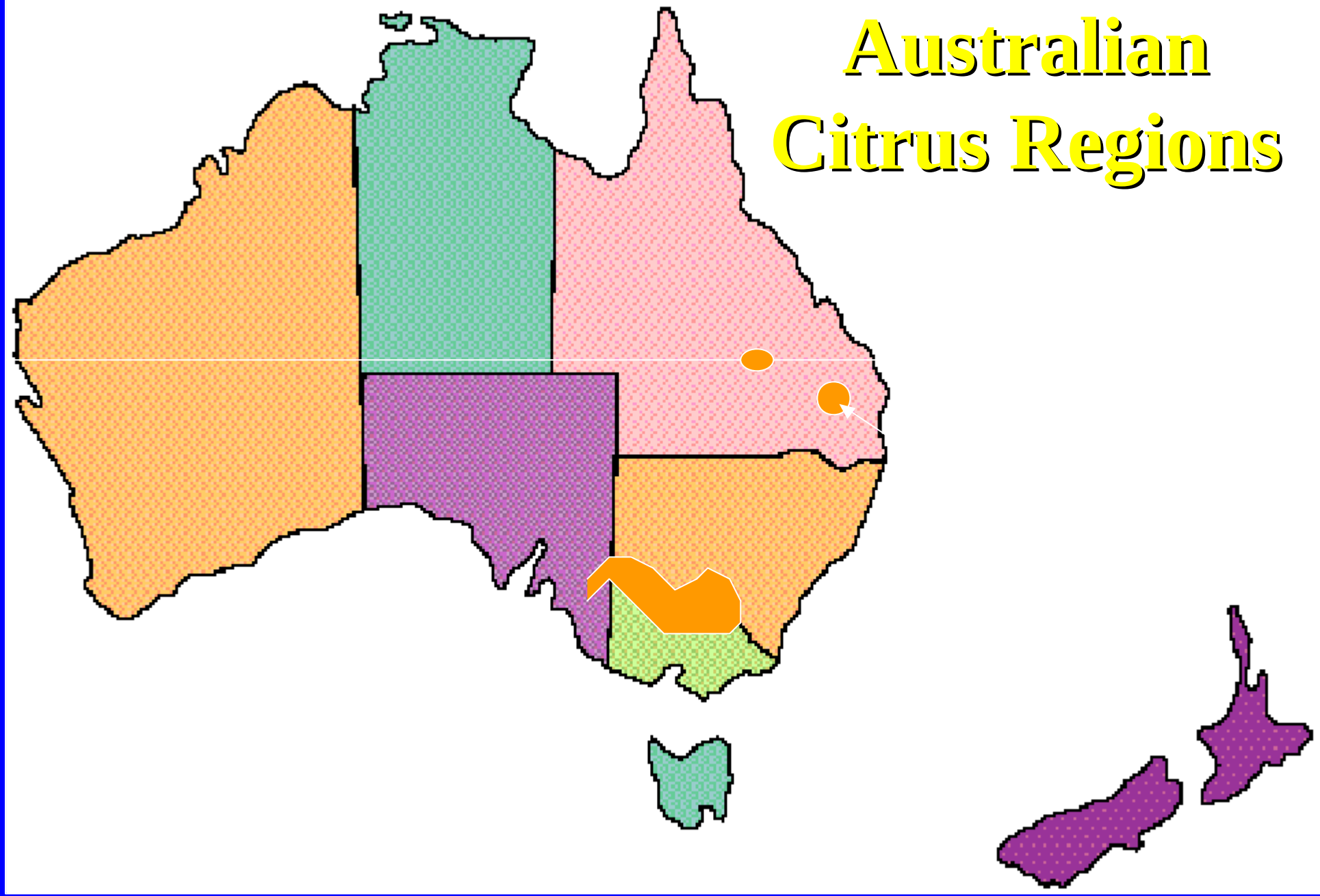
Integrated Pest Management p/l

Bugs for Bugs

Mundubbera, Q

Australia

Australian Citrus Regions



Components of an IPM system

- Biological control (Classical)
- Monitoring Systems
- Data Recording & Reporting
- Use of Mass Reared Beneficial Insects
- Cultural Practices for Improved IPM
- Decision Making & Management
- Research & Feedback

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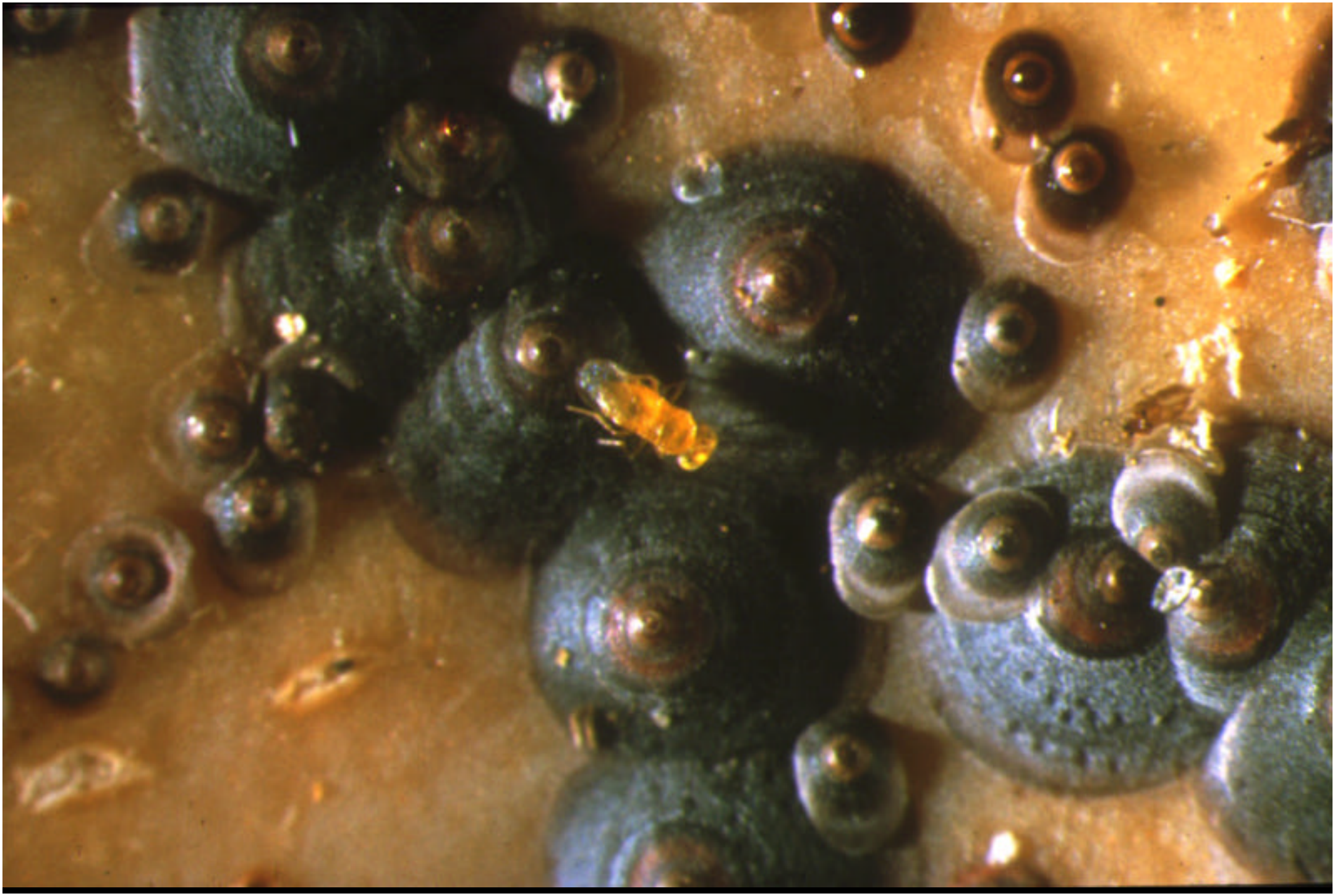
Recent introductions to QLD citrus



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Sampling Sites Required

Block Area (Ha.)	Sites Required	Time (min.)
0-2	10	20-30
2-3	12	25-35
3-4	15	30-45
4-8	20	40-60
8-16	25	50-75
>16	30	60-90

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Orchard: ESMERALDA Date: 24/2

Block: 2 GF Sampler: A.H.

	Ev	Po	Ta	crs	cmb	fl	Lx		
1	4	0	0	1	2	0			
~~2~~ X	2	1	0	0	0	2			
3	3	0	0	1	2	0			
4	4	0	0	2	1	0	1		
5	1	2	0	0	1	0			
6	1	0	0	1	0	0			
X	8	0	0	0	0	0			
8	6	0	0	0	1	0	1		
9	2	0	0	0	0	0			
10	1	0	0	0	0	0			
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
	64	6	0	10	14	4			

Lx = 2/7 = 28%.

YRM Low NOS.

Aphytis ACTIVE.

Monitoring Report Sheet

Block			Pred Mite	Y Rust Mite	Maori Mite	Red Scale	Mealy bug	Flatid	SCB		WLse	Orchard: ESMERALDA Date: 24 JAN
1E	10		30	0	0	0	4	2				
2E	10/2		116	0	0	4	2	0			4	
3E	10		218	0	0	5	2	*20			5	SPRAY ENDOSULFAN @ 30mLs/100L.
4E	10		22	0	2	0	0	2			2	
5E	20/4		0	0	4	4	0	0				
6E	15		68	2	2	0	2	0				
7E	12		48	0	2	*32	0	2				BOOSTER RELEASE APHYTIS HERE.
8E	10		112	2	0	6	0	0			2	
9E	15		32	0	0	0	0	0				
10E	10		114	0	0	16	8	0				
11E	10		15	*30	6	15	21	3				Spray mancozeb @ 200g/100L for yrm.
1Gf	10		0	6	0	2	22	0			4	
2Gf	10		0	0	6	2	2	0			2	
3Gf	10/2		12	2	*18	0	18	0			2	PRED. MITE SHOULD CONTROL MAORI - OK TILL NEXT VISIT
1Gl	10		18	0	0	12	0	0	1/10			
2Gl	10/2		0	0	*14	4	0	0				MAORI LOW NOS./FRUIT - OK TILL NEXT VISIT

QFF= 27/12

2.3 flies/day

Bm broad mite
OM oriental mite
Wlse white louse scale
SS soft scale
Pwx pink wax scale
J jassid

CT citrus thrips
CRT citrus rust thrips
Cat caterpillar
Hel heliothis
Kat katydid
SCB spined citrus bug

Lw lacewing
Cm cryptolaemus
Lx leptomastix
BS black spot
mel melanose
EBS emperor brown spot

COMMENCE BAITING IN IMPS

Orchard Treatment Record Sheet

Block Name/No.	Variety
SAVAGES	IMPERIALS

Operator	CRAIG	
Date	28 SEP 97	Capacity
Spray Cart	RED CART	3000 L

Products	Amount/Rate
1 COPPER HYDROXIDE	3 kg
2 Zinc	3 kg
3 Agral 60	400 mLs
4	

Vat Count	Total Vats
HH I	6

Tractor Gear	rpm	Pressure
ISEKI 3RD LOW	1200	500 psi

Weather/Comments

Temperature at start ....28....°C

Wind .....5.....knots from.....SE.....(direction)

Cloud .....1.....Octas (eighths)

Rain/Showers.....N/L.....

Other .....

.....

Field Data Pre - Sort

Block	Var	Date	Ev	Po	Ta	CRS	CMB	Fl	Scb	Bm	Wl	Lw	Mbp	Cm
1	N	8-Dec	130	0	0	24	50	4						
2	Gf	8-Dec	14	0	0	0	62	6						
3.1	I	8-Dec	6	0	0	2	4	12						
3.2	H	8-Dec	54	0	0	2	8	0						
3.3	I	8-Dec	12	0	0	1	0	18						
4	Gf	8-Dec	36	0	0	0	46	14						
5	V	8-Dec	55	0	0	5	15	25			2	17		
7	E	8-Dec	2	0	0	0	0	6						
7	N	8-Dec	56	0	0	0	18	2						
8	E	8-Dec	18	0	0	1	4	6						
8	Gf	8-Dec	2	0	0	0	28	34						
9	I	8-Dec	4	0	0	0	2	6						
9	N	8-Dec	68	0	0	12	15	10						
12	E	8-Dec	17	0	0	0	3	3						
12	N	8-Dec	63	0	8	12	8	5						
13	E	8-Dec	0	0	0	1	2	3						
13	H	8-Dec	102	0	0	2	6	2						
13	Mc	8-Dec	0	0	0	2	10	24						
14	I	8-Dec	5	0	0	3	0	0						
14	Mc	8-Dec	0	0	0	1	9	5						11
14	N	8-Dec	17	0	0	42	25	1					5	
15	V	8-Dec	0	0	0	0	10	0				8		17

Field Data Post - Sort

Block	Var	Date	Ev	Po	Ta	CRS	CMB	Fl	Scb	Bm	Wl	Lw	Mbp	Cm
9	N	Oct 9	0	0	0	0	0	0				8		
9	N	Oct 16	2	0	0	0	0	0						
9	N	Oct 30	0	0	0	0	0	0						
9	N	Nov 12	7	0	0	15	2	0						
9	N	Nov 27	7	0	0	30	24	7						
9	N	Dec 8	68	0	0	12	15	10						
9	N	Dec 18	70	0	0	8	28	8						21
9	N	Jan 5	378	0	0	12	34	0						
9	N	Jan 16	260	0	0	20	15	2				16		22
9	N	Jan 27	72	0	0	7	13	0				8	25	
9	N	Feb 9	20	0	0	8	6	3				8		
9	N	Feb 20	25	0	0	3	3	3						
9	N	Mar 5	18	0	0	0	3	0						
9	N	Mar 18	20	0	0	0	0	2						
9	N	Mar 31	52	0	0	2	2	0						
9	N	Apr 14	18	0	0	0	0	0						
9	N	Apr 27	16	0	0	0	0	0				25		
9	N	May 12	14	0	0	0	0	0						

Kugel's 2 Ellendales 96/97

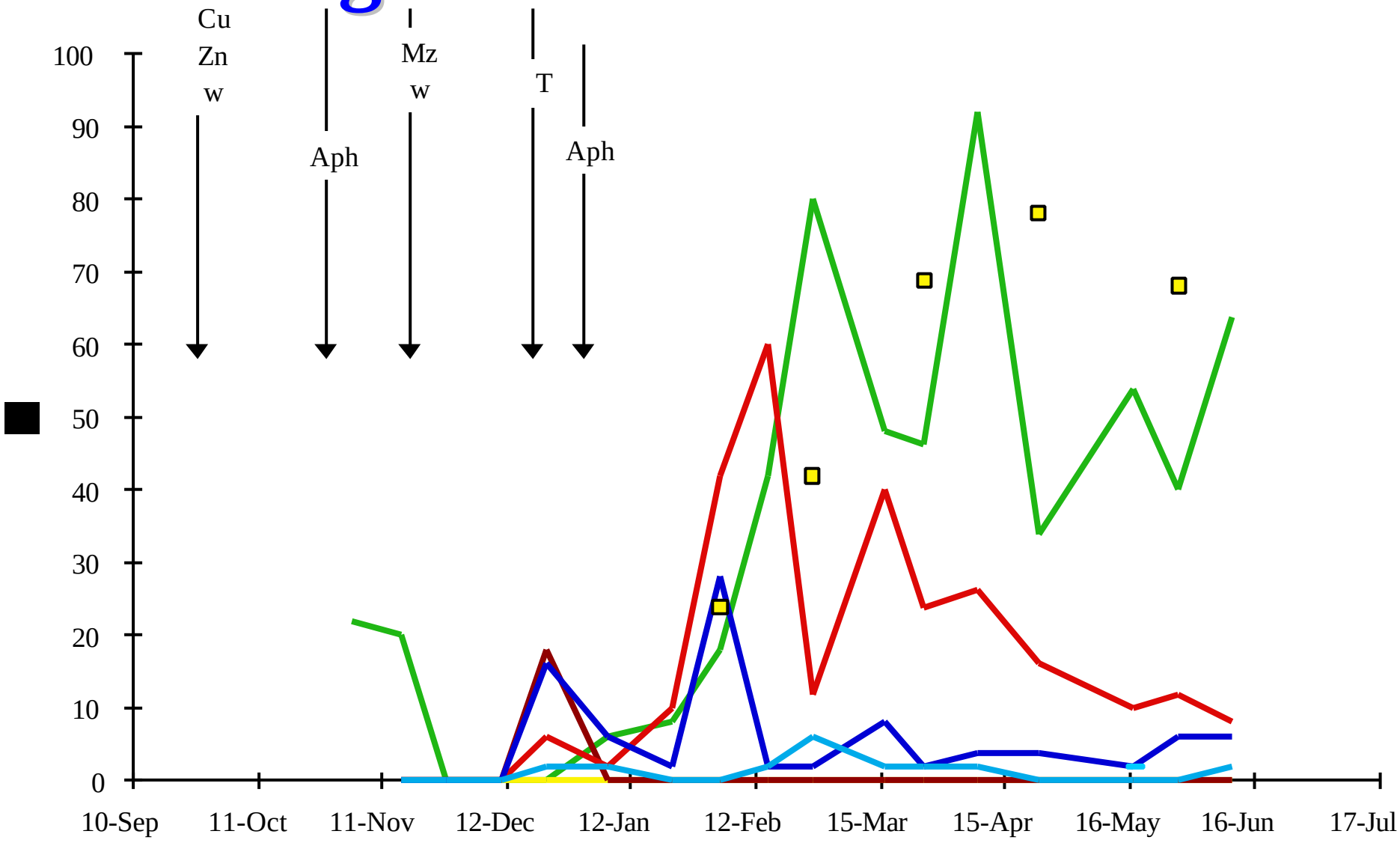
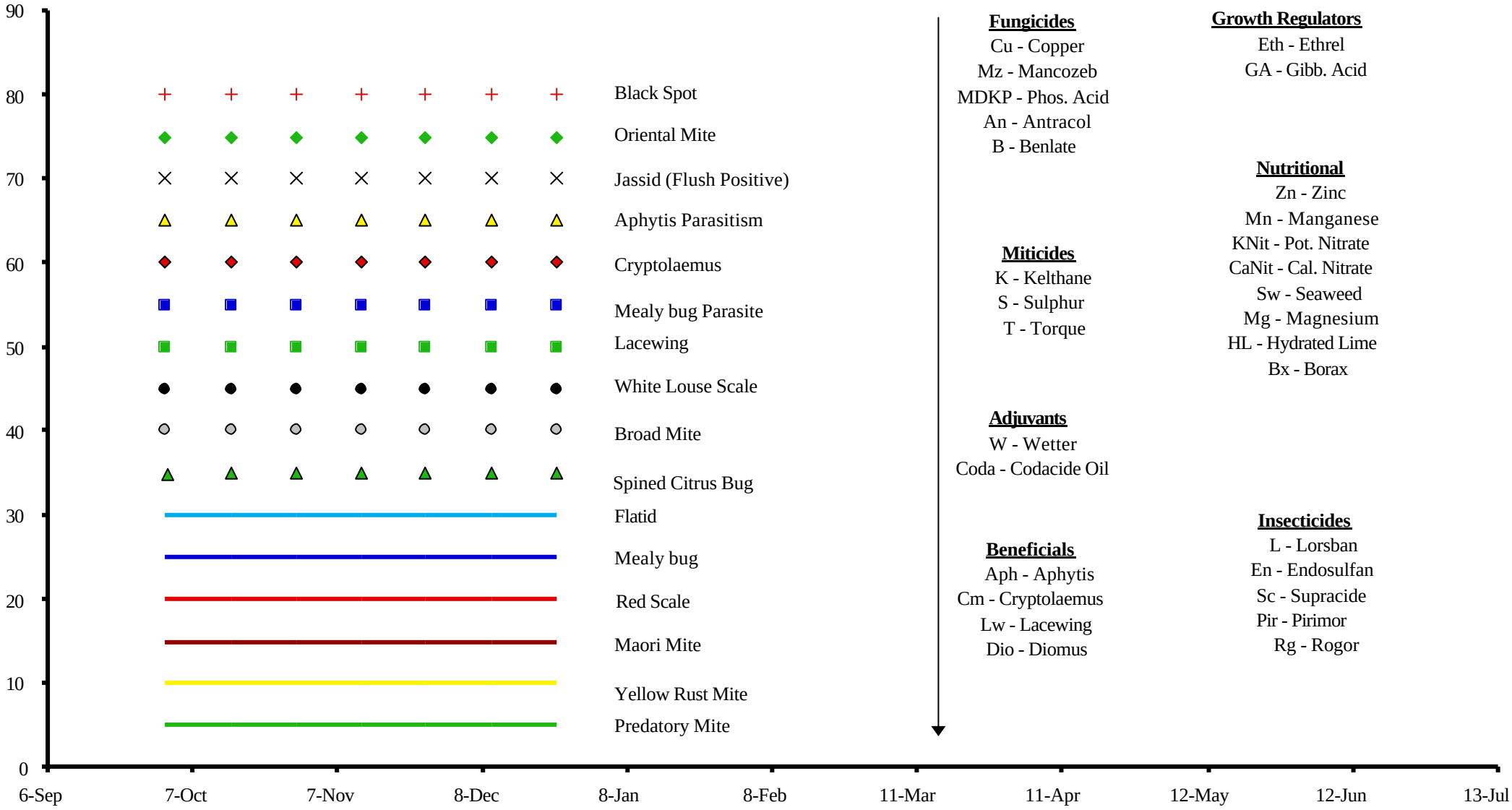


Chart Key



Fungicides
Cu - Copper
Mz - Mancozeb
MDKP - Phos. Acid
An - Antracol
B - Benlate

Miticides
K - Kelthane
S - Sulphur
T - Torque

Adjuvants
W - Wetter
Coda - Codacide Oil

Beneficials
Aph - Aphytis
Cm - Cryptolaemus
Lw - Lacewing
Dio - Diomus

Growth Regulators
Eth - Ethrel
GA - Gibb. Acid

Nutritional
Zn - Zinc
Mn - Manganese
KNit - Pot. Nitrate
CaNit - Cal. Nitrate
Sw - Seaweed
Mg - Magnesium
HL - Hydrated Lime
Bx - Borax

Insecticides
L - Lorsban
En - Endosulfan
Sc - Supracide
Pir - Pirimor
Rg - Rogor

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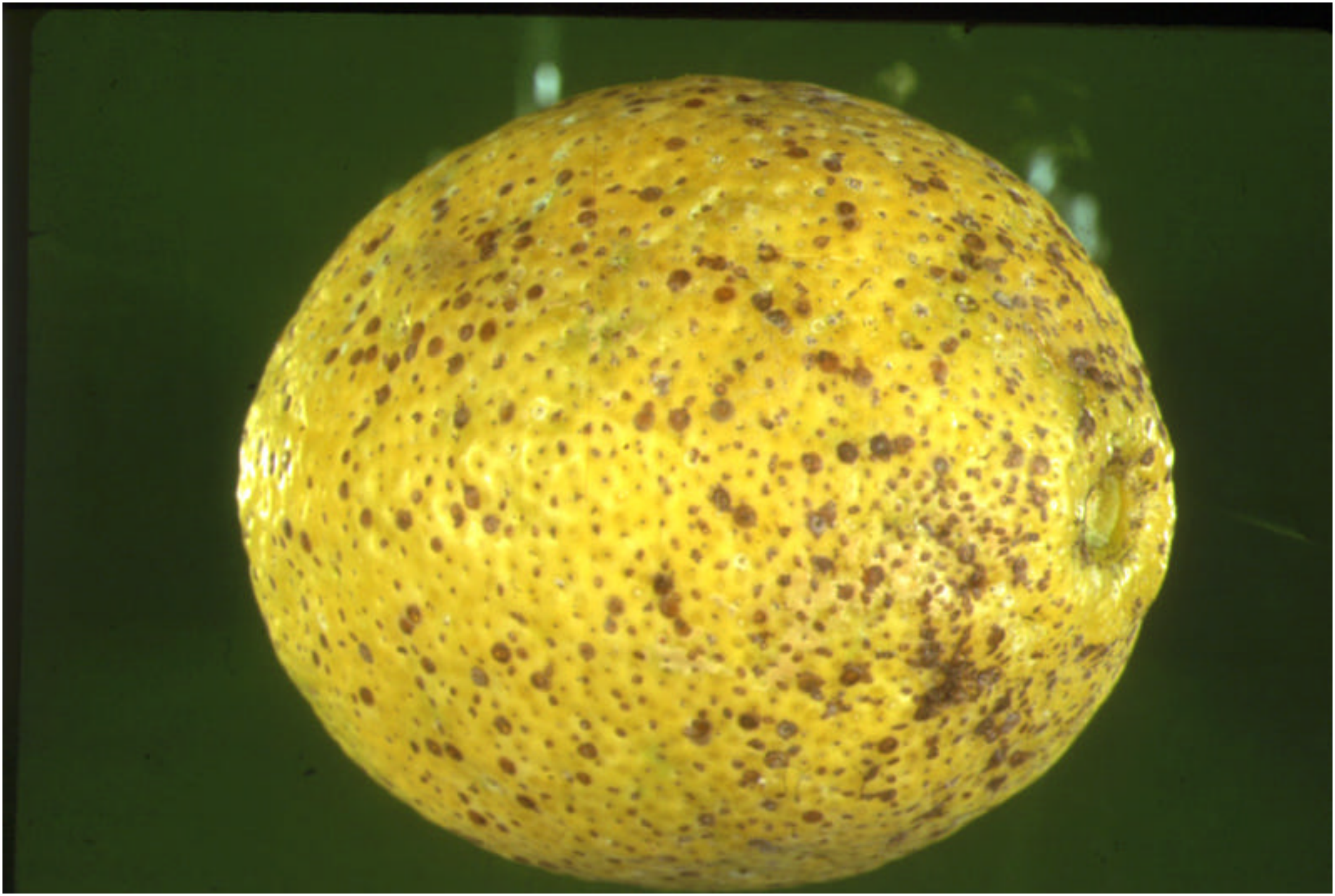
Bugs n Bugs




29. 6. 2000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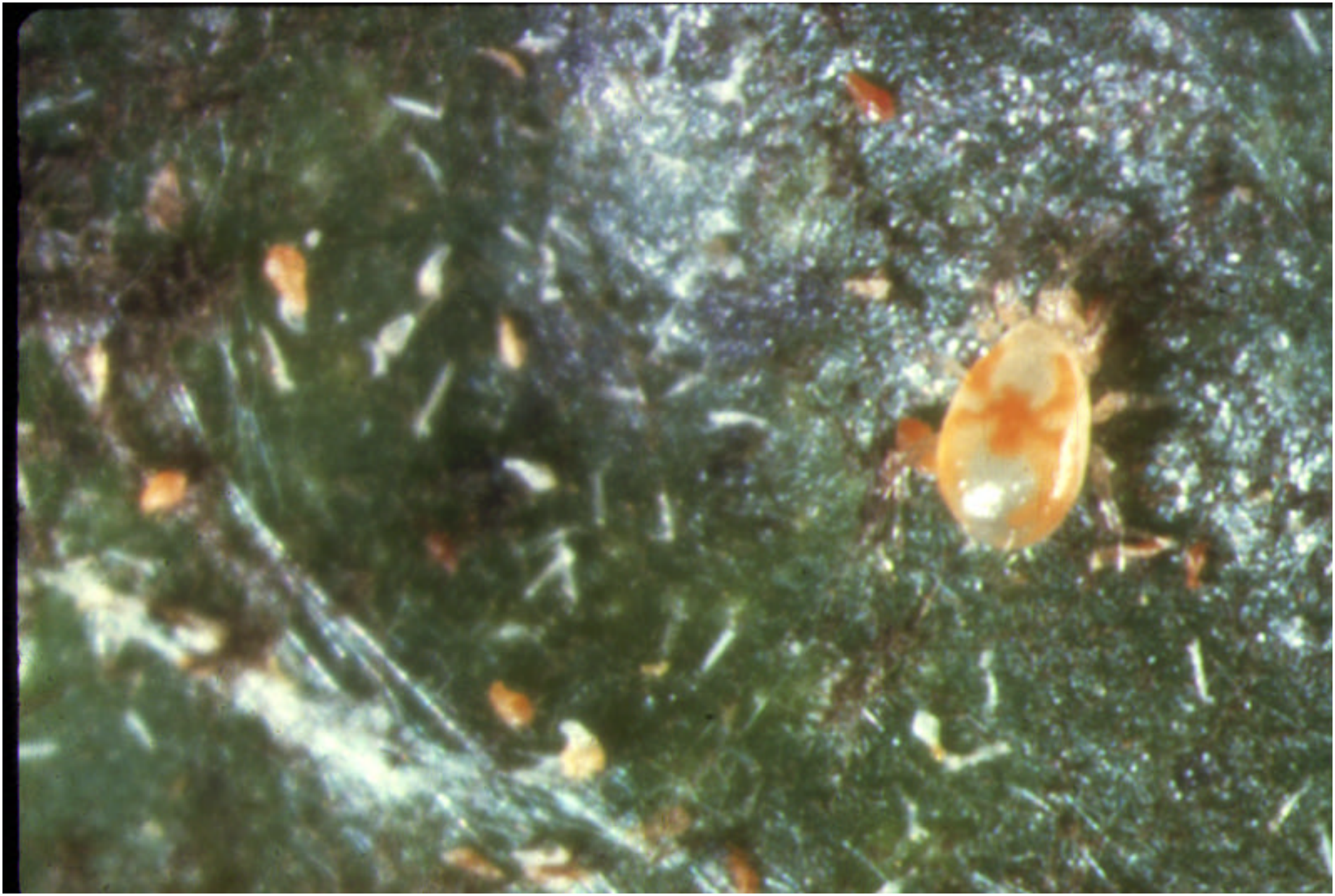

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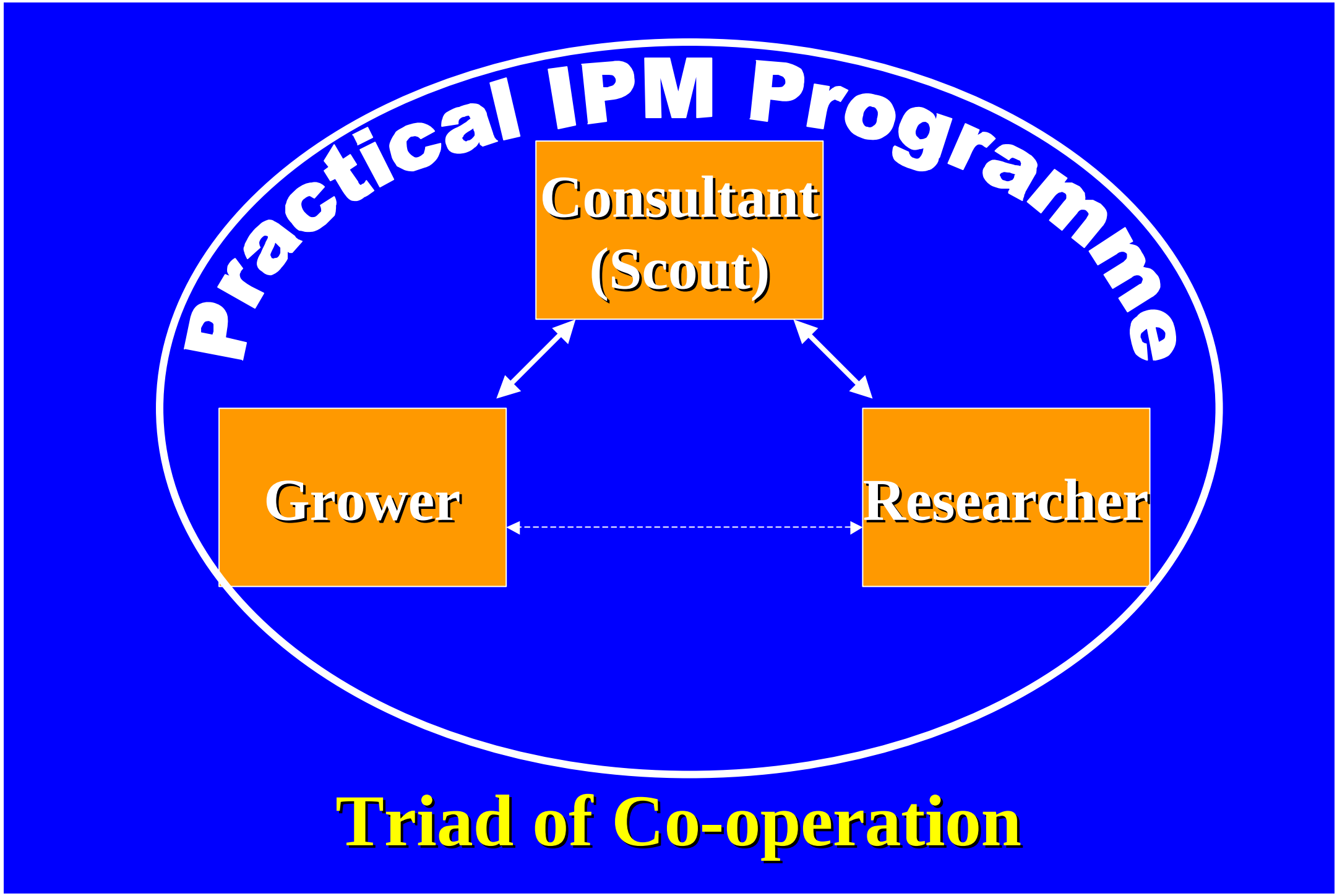
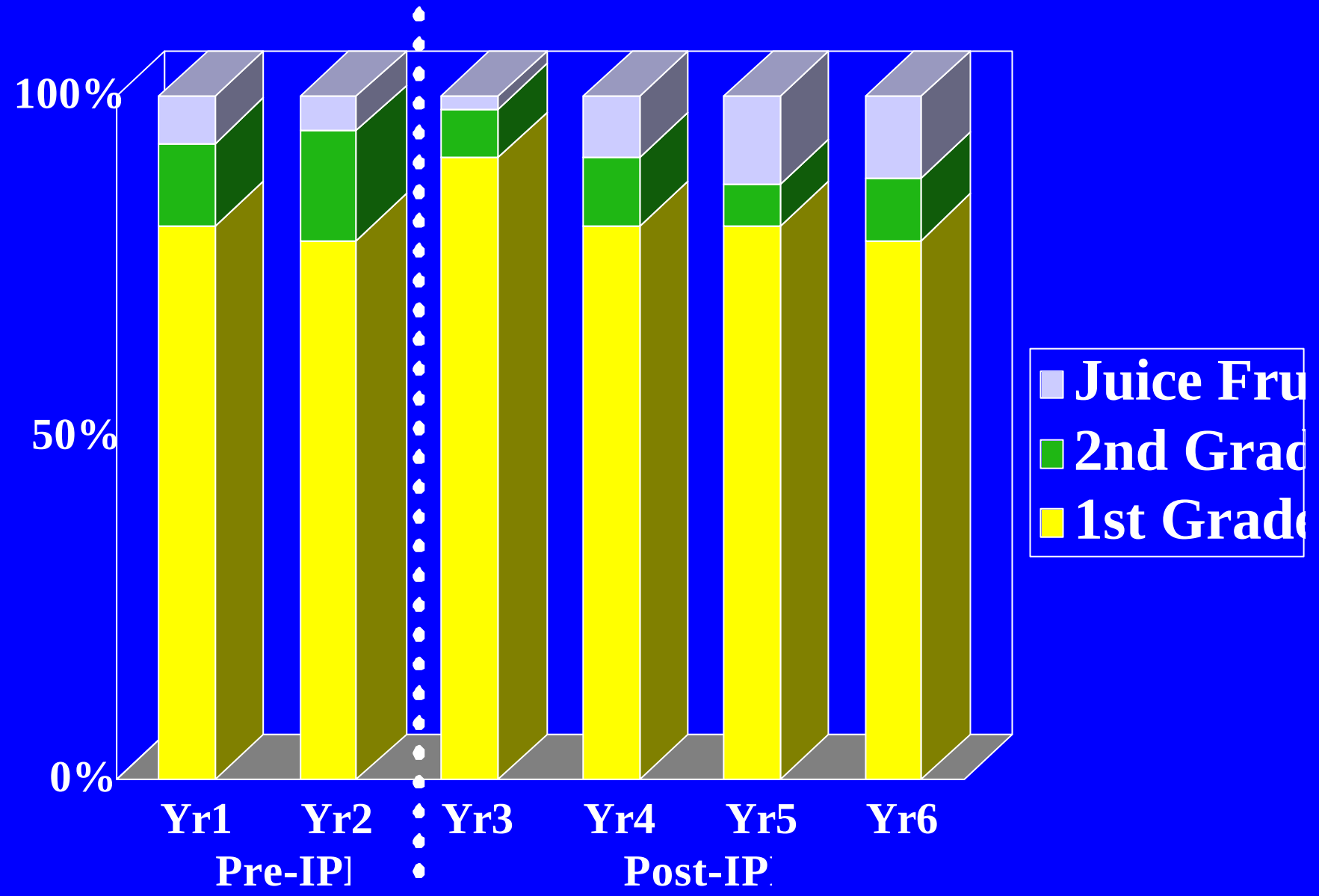
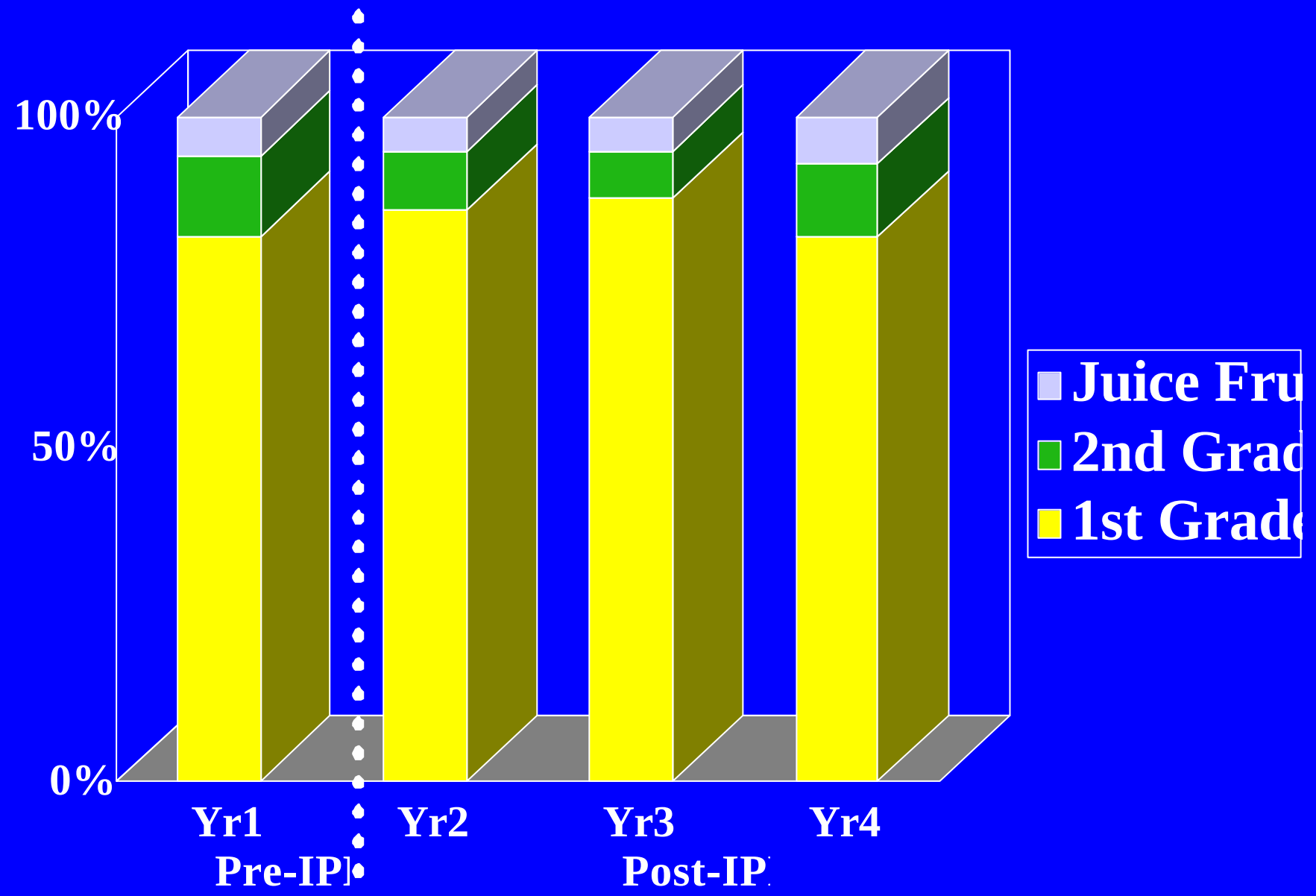


Triad of Co-operation

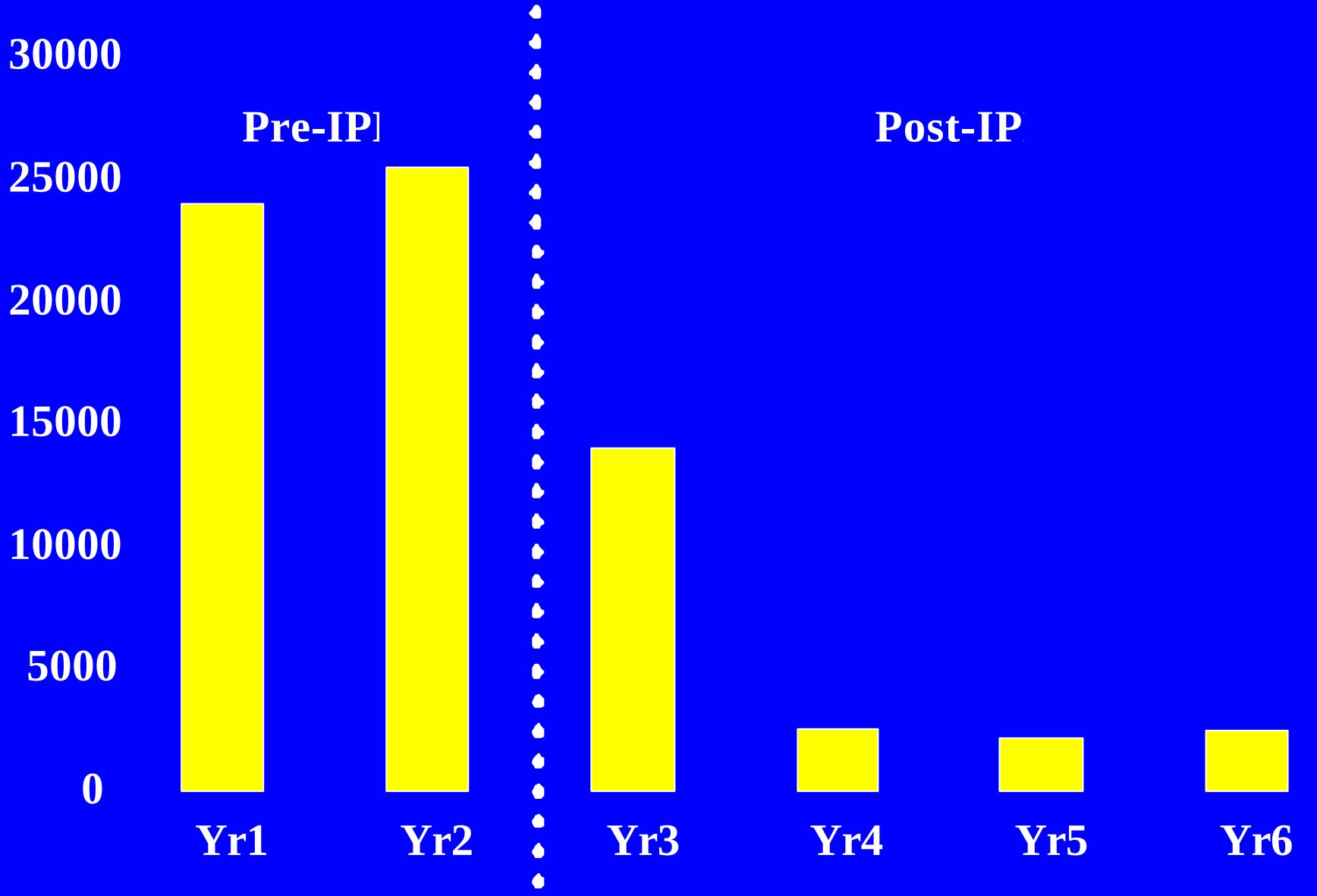
Fruit Quality (orchard 1)



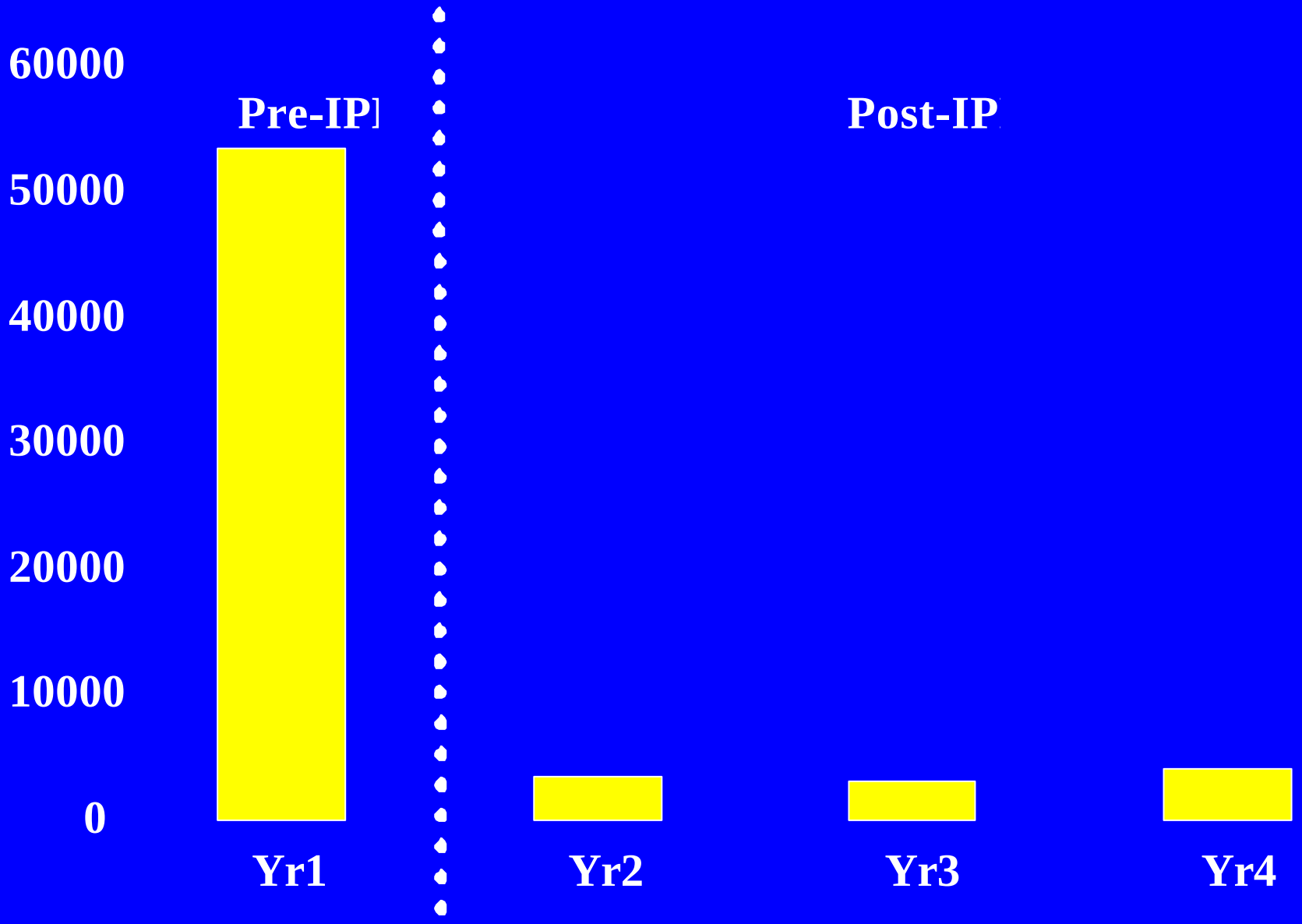
Fruit Quality (orchard 2)



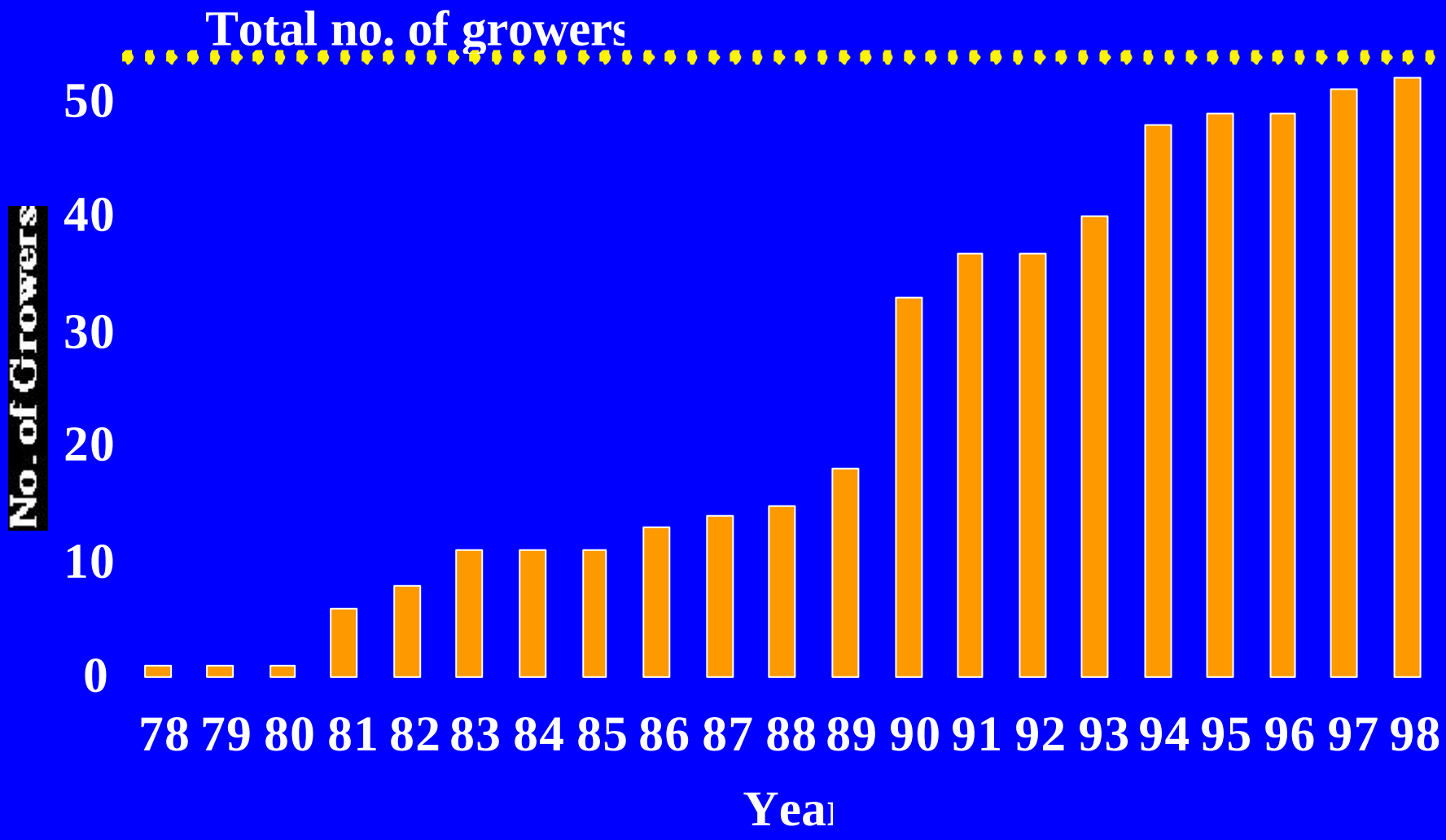
Insecticides & Miticides ($AUS) : Orchard 1



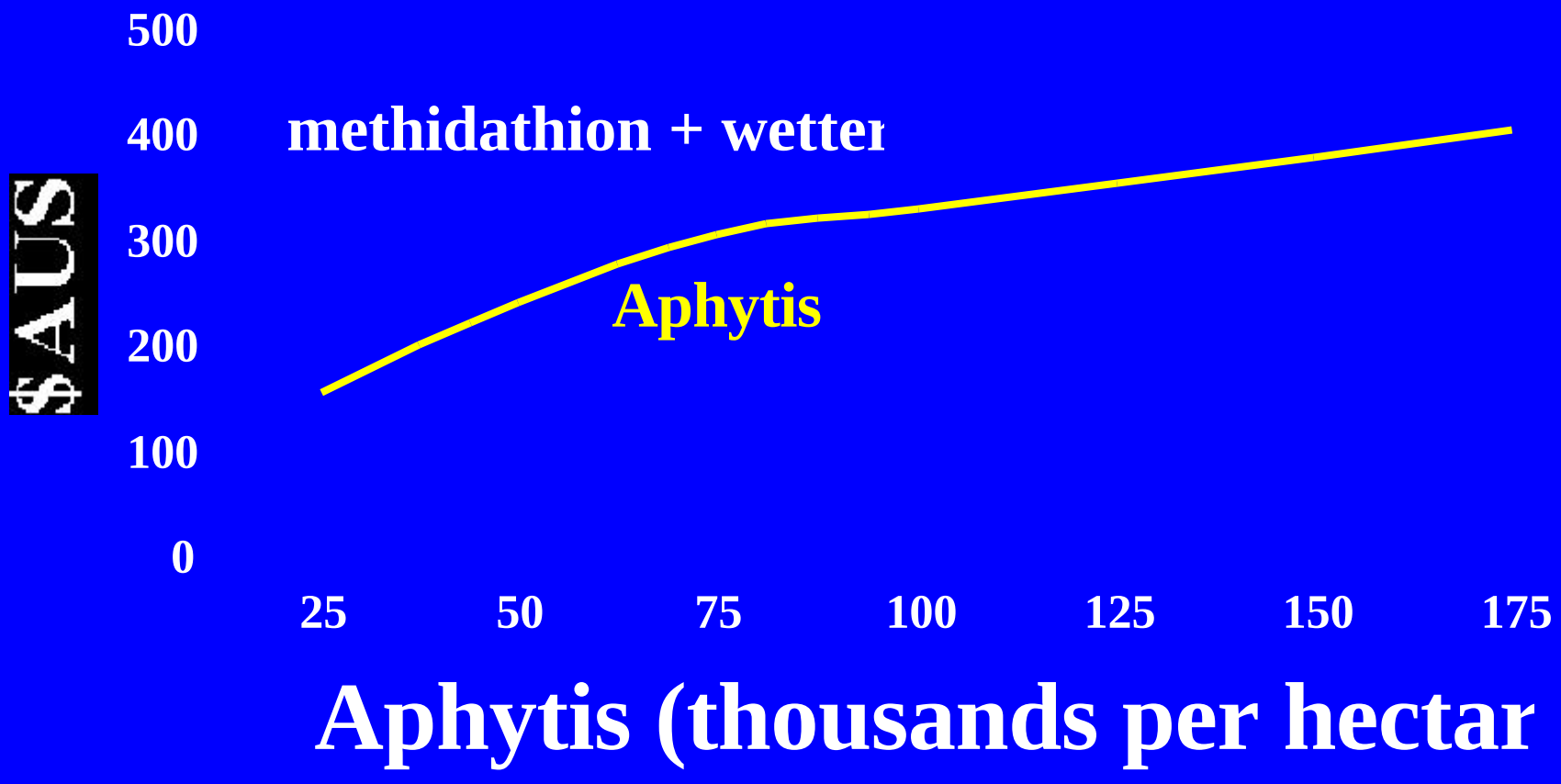
Insecticides & Miticides ($AUS) : Orchard 2



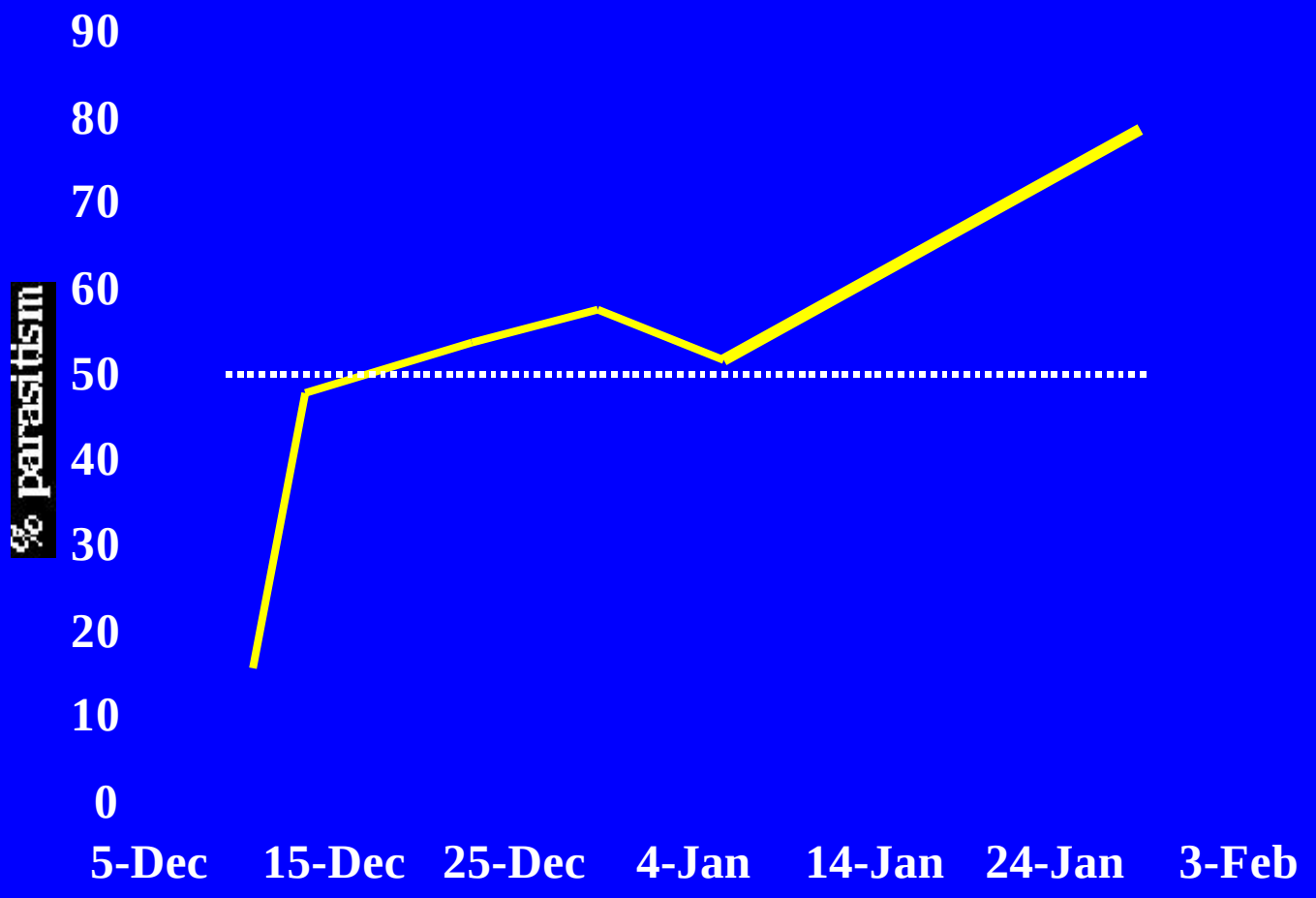
Adoption of IPM in Citrus



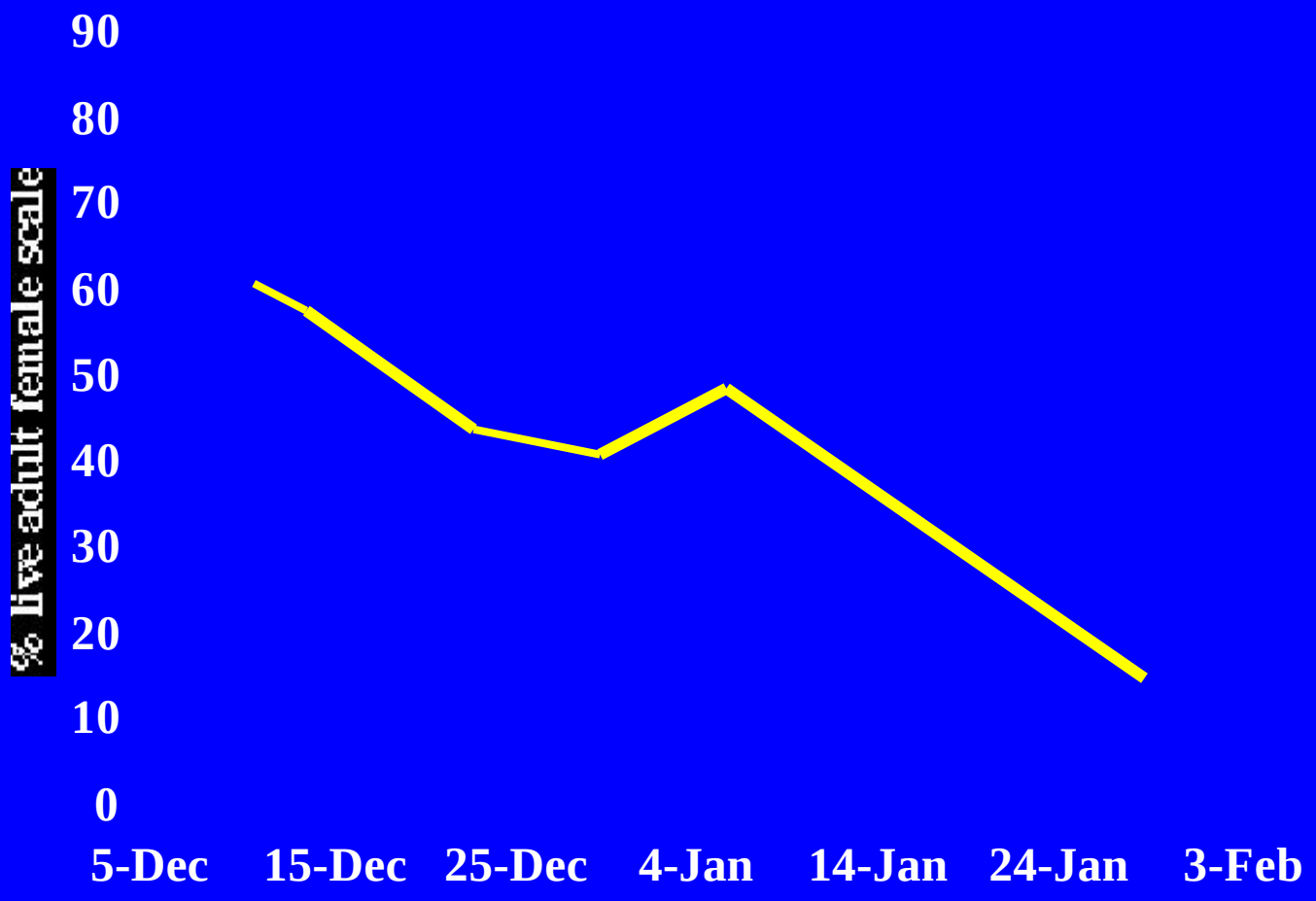
Aphytis Release - Comparative Cost



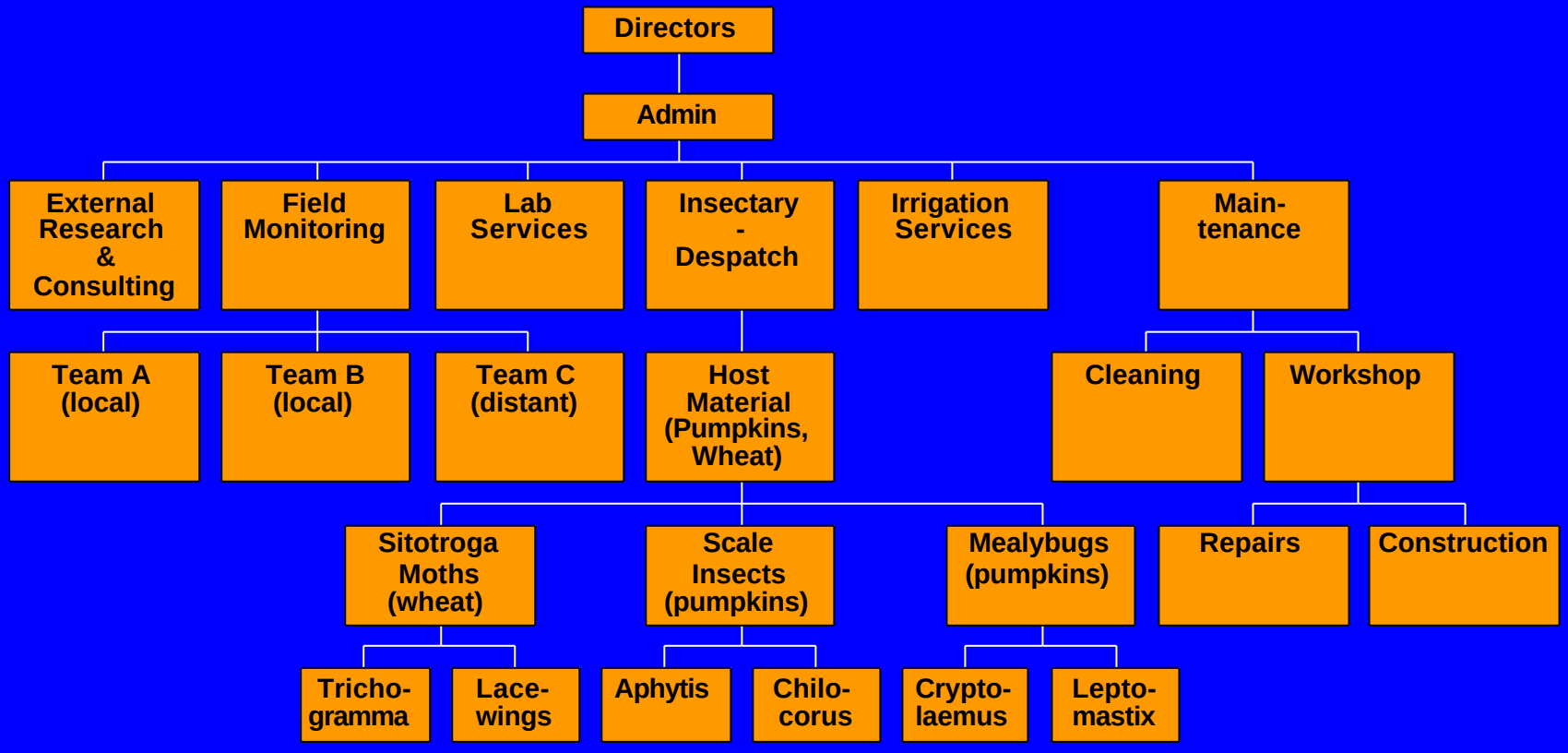
Aphytis Release Trial - Parasitism



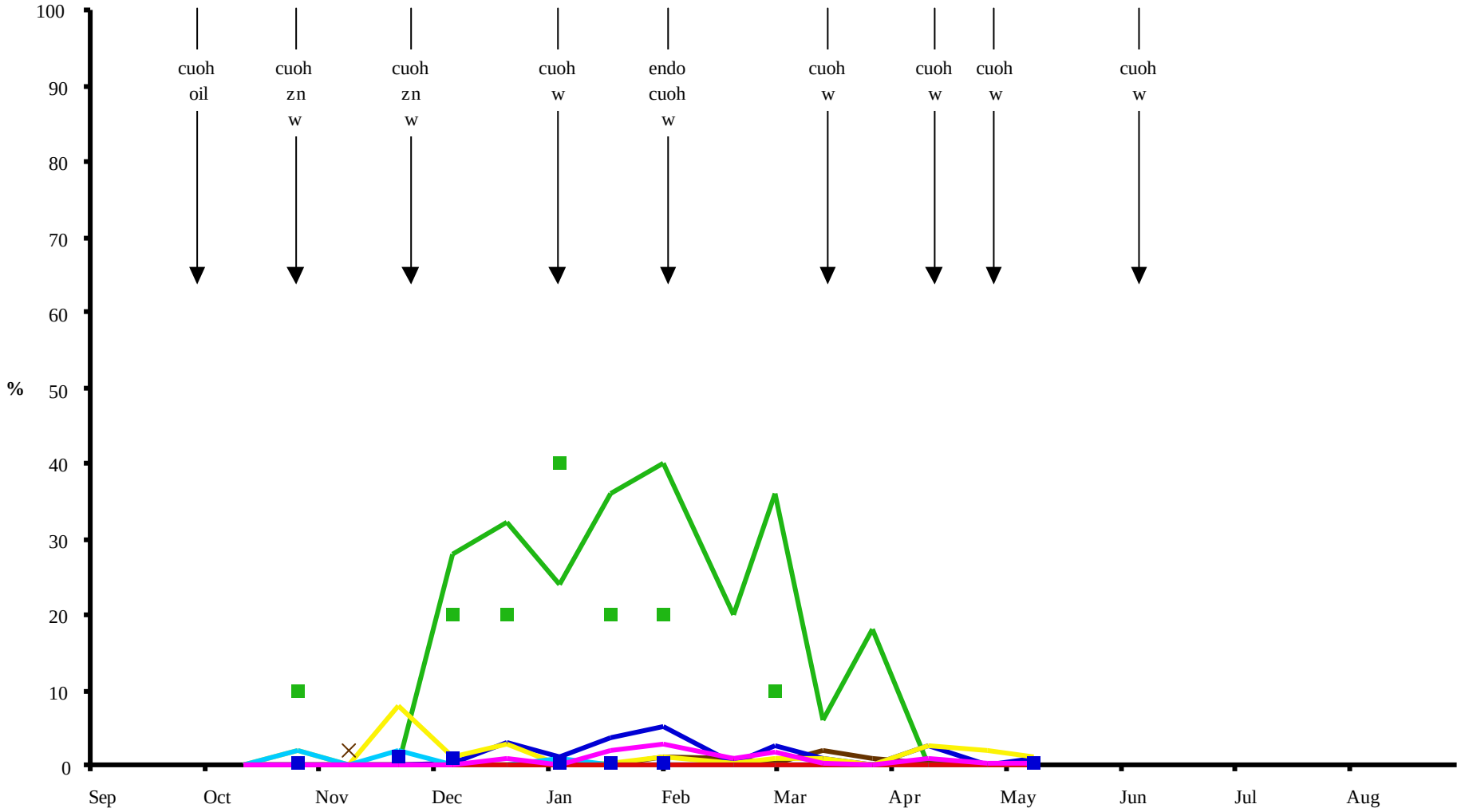
Aphytis Release Trial - Live Scale



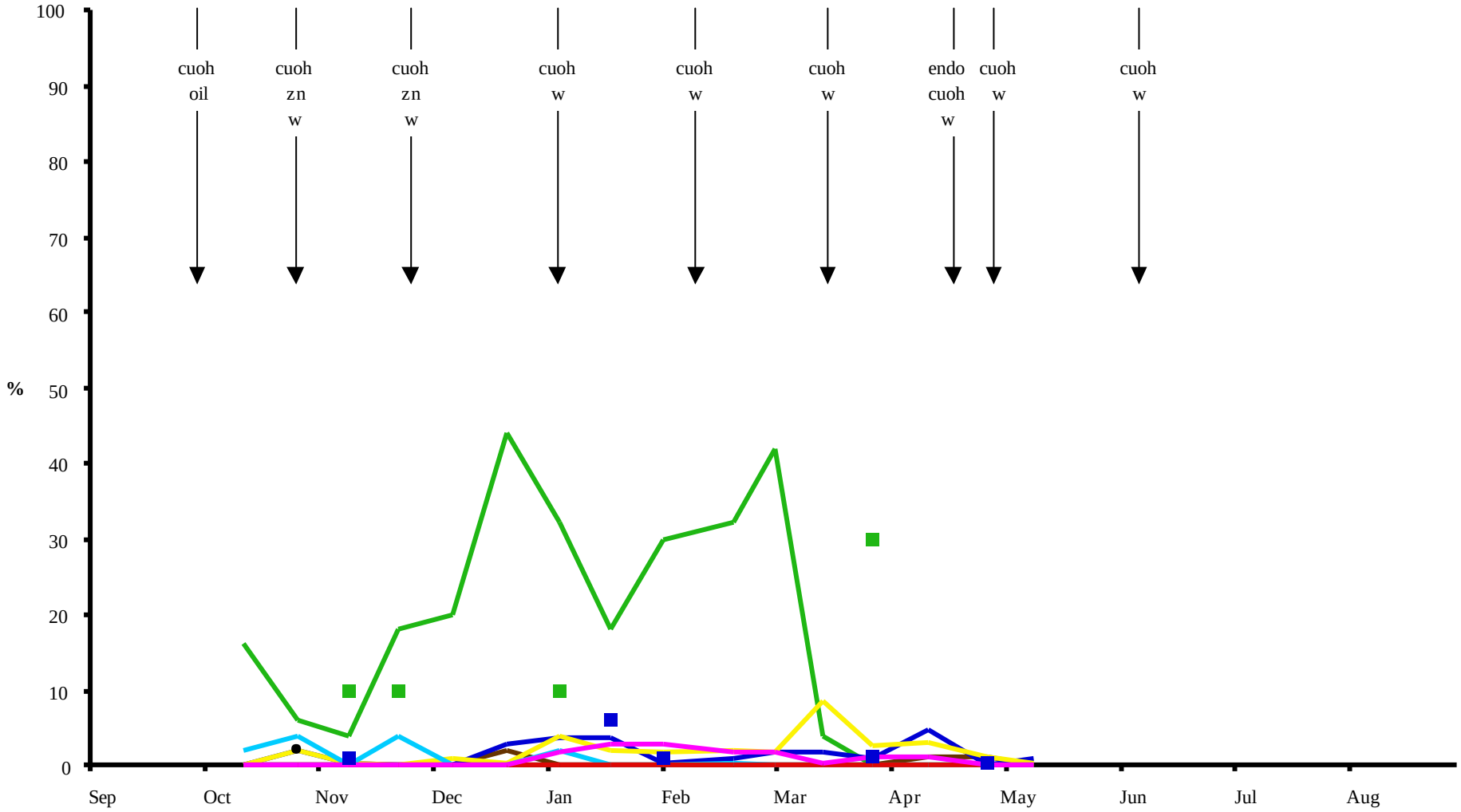
IPM p/l - Organisational Structure



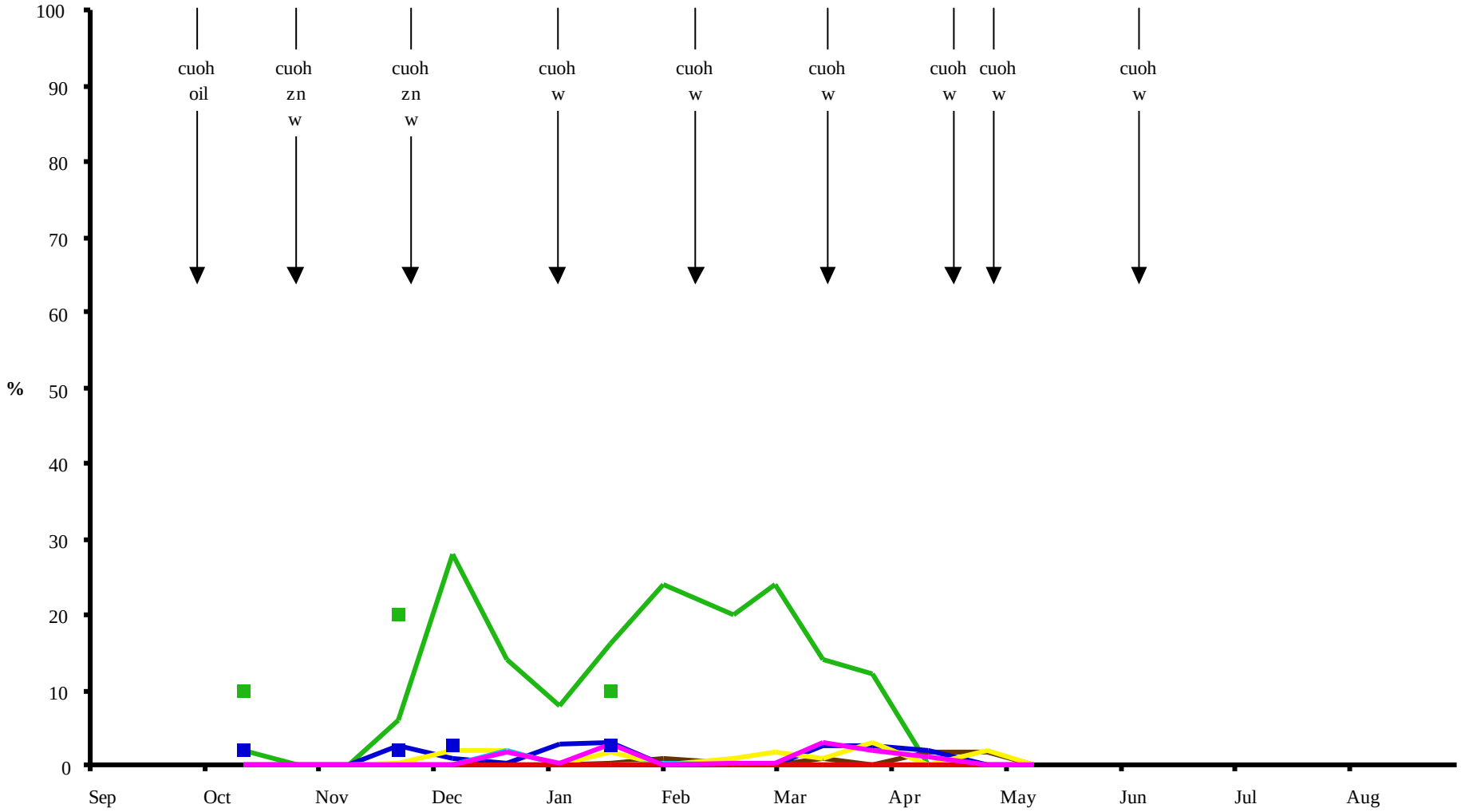
Yandilla Park Farm #10 - 45 Avocado 99/00



Yandilla Park Farm #10 - 46 Avocado 99/00



Yandilla Park Farm #10 - 47 Avocado 99/00



AVOCADO CHART KEY 99/00