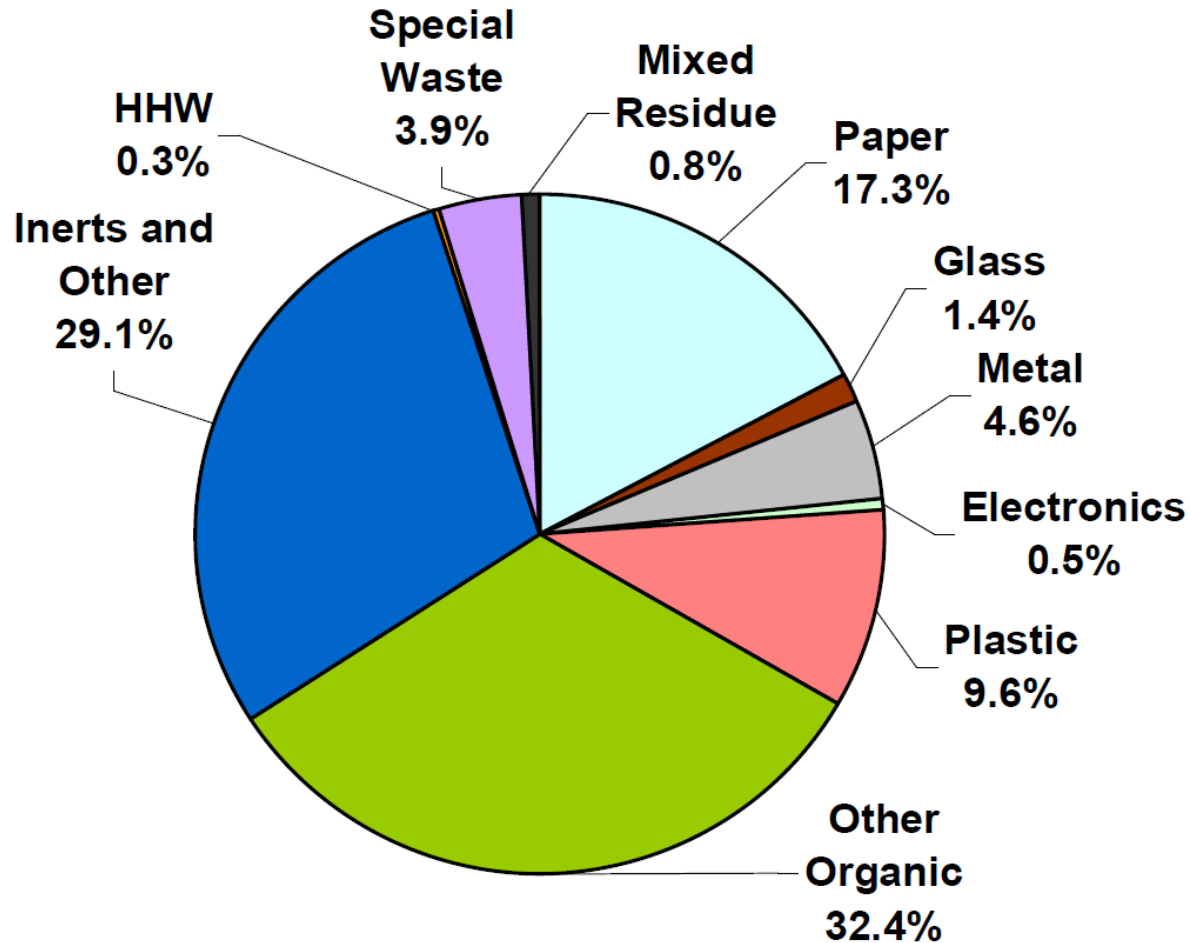


Finding beneficial solutions to Southern California's waste management challenges.

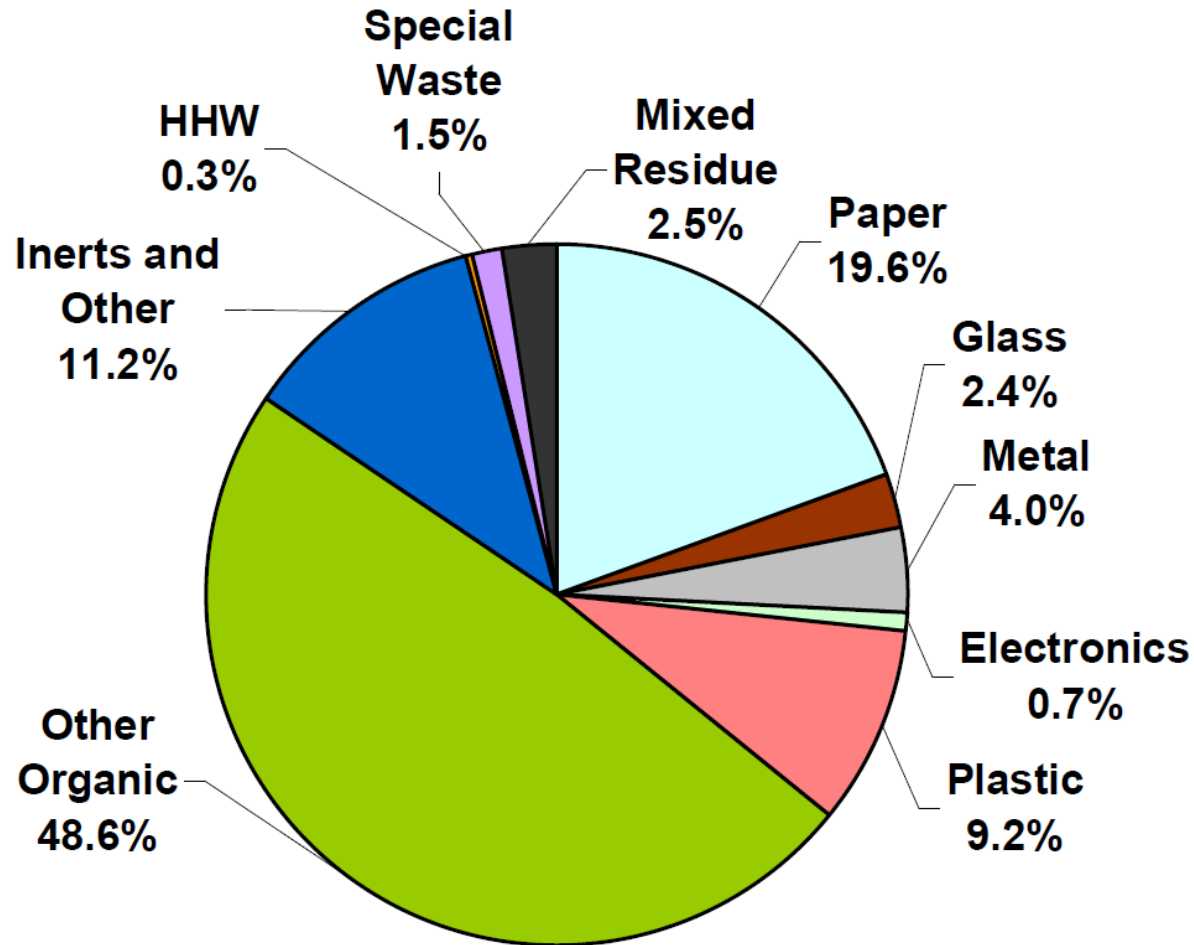
David Crohn
UC Riverside.

What is disposed in California - Total



CalRecycle, 2008

What is disposed in California - Residential

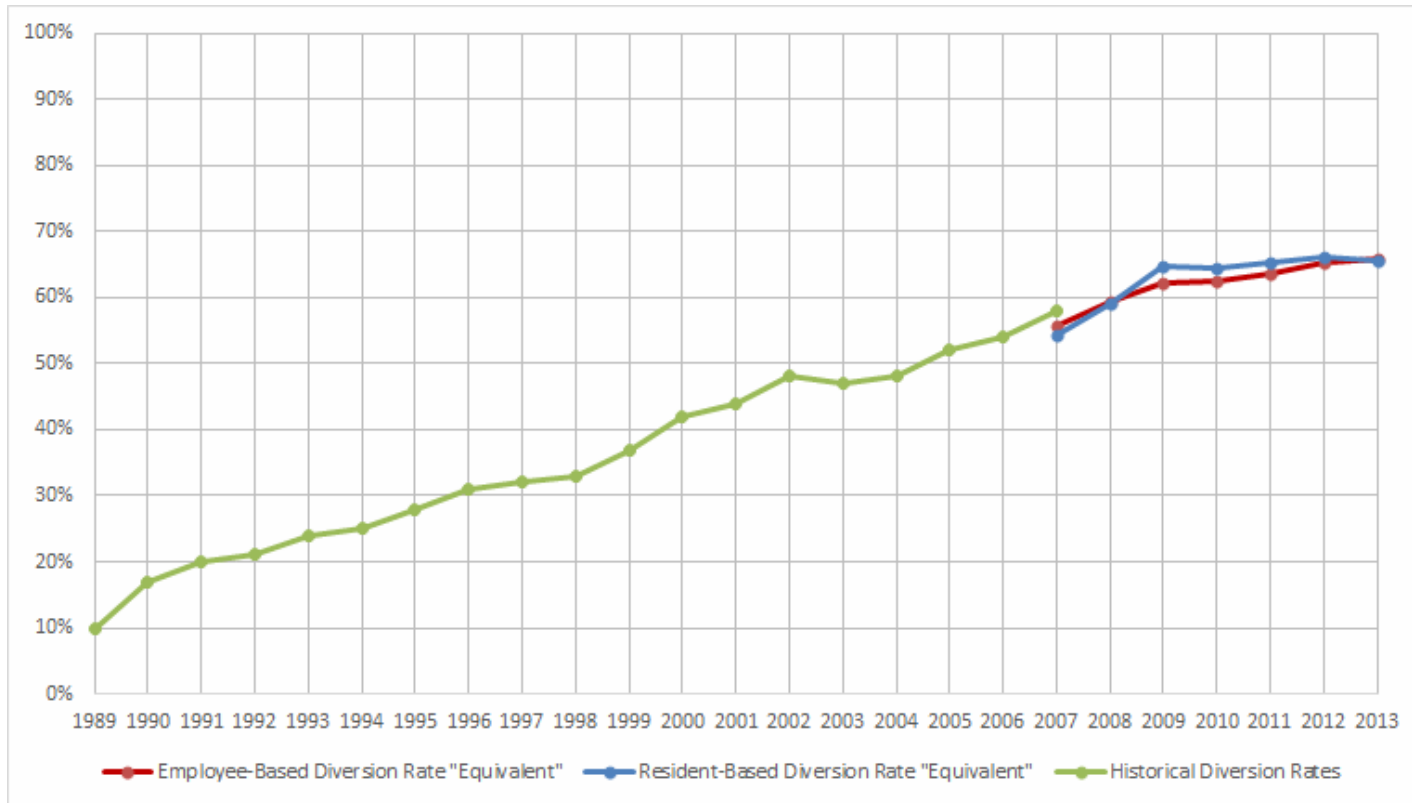


CalRecycle, 2008

Laws

- AB 939: CA Integrated Waste Management Act of 1989
 - Mandated 50% diversion by 2000
 - Each county answerable to CalRecycle
 - Combustion does not count
 - Landfill alternative daily cover (ADC) does

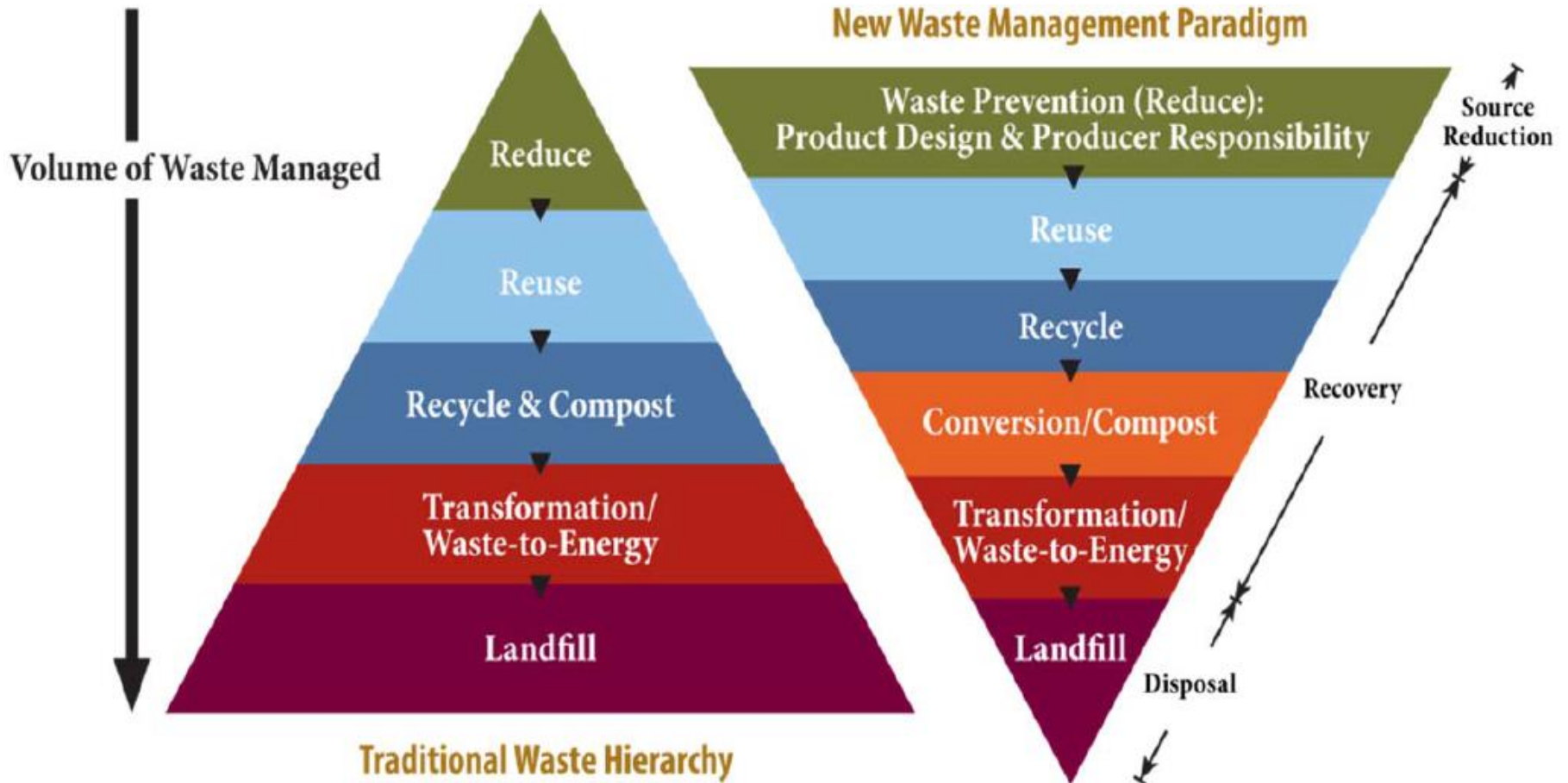
CA Diversion Rates



Recyclables: a HUGE export item

- 25% of all commodities shipped from California ports in 2013 (19 million tons)
 - This is 43% of all recyclables shipped from the U.S.
 - 87% → China, Taiwan, or Korea (>50% → China)
 - >50% was paper or cardboard
- 7 % of the total value of all exports shipped from California (worth \$7.5 billion).
 - 75% of the value derived from metals
- Fill empty ships for return trips
- Exports are slowly declining
- But what if more materials were recycled here?

New and Old Waste Hierarchies



LA Co. Public Works, 2013

Laws

- AB 341: 75 Percent Recycling by 2020 (2011)
 - Required CalRecycle to develop strategy
 - *Recycling* (not diversion as in AB 939)
 - Includes source reduction, recycling, composting, anaerobic digestion
 - Excludes landfilling, exported disposal, ADC, waste-to-energy
 - Requires recycling in most businesses and apartment buildings

AB 341

- May create 100,000 jobs
 - Collection and processing requires 5.3 jobs per 1000 tons of material. And, each new job creates an additional job, either indirectly related to the recycling process or induced by it.
 - Curbside recycling, MRF operations and transfer create 2.9 jobs per 1000 tons.
 - Source separation creates 7.9 jobs per 1000 tons.
 - Collection and landfilling supports just 1.3 jobs per 1000 tons.

CalRecycle, 2013

Laws

- AB 1594:
Compostable
Organics
Management
(Sept. 28, 2014)
 - No more
diversion
credit for
alternative
daily cover
(ADC)
 - But no fee
either



Sector	Est. Percentage of Disposed Waste Stream	Est. Tons Disposed Statewide
Commercial	49.5%	19,672,547
Residential	30.0%	11,935,173
<i>Single-family residential</i>	21.6%	8,583,746
<i>Multifamily residential</i>	8.4%	3,351,428
Self-hauled	20.4%	8,115,098
<i>Commercial self-hauled</i>	17.2%	6,812,464
<i>Residential self-hauled</i>	3.3%	1,302,634
Totals	100.0%	39,722,818

CalRecycle, 2008

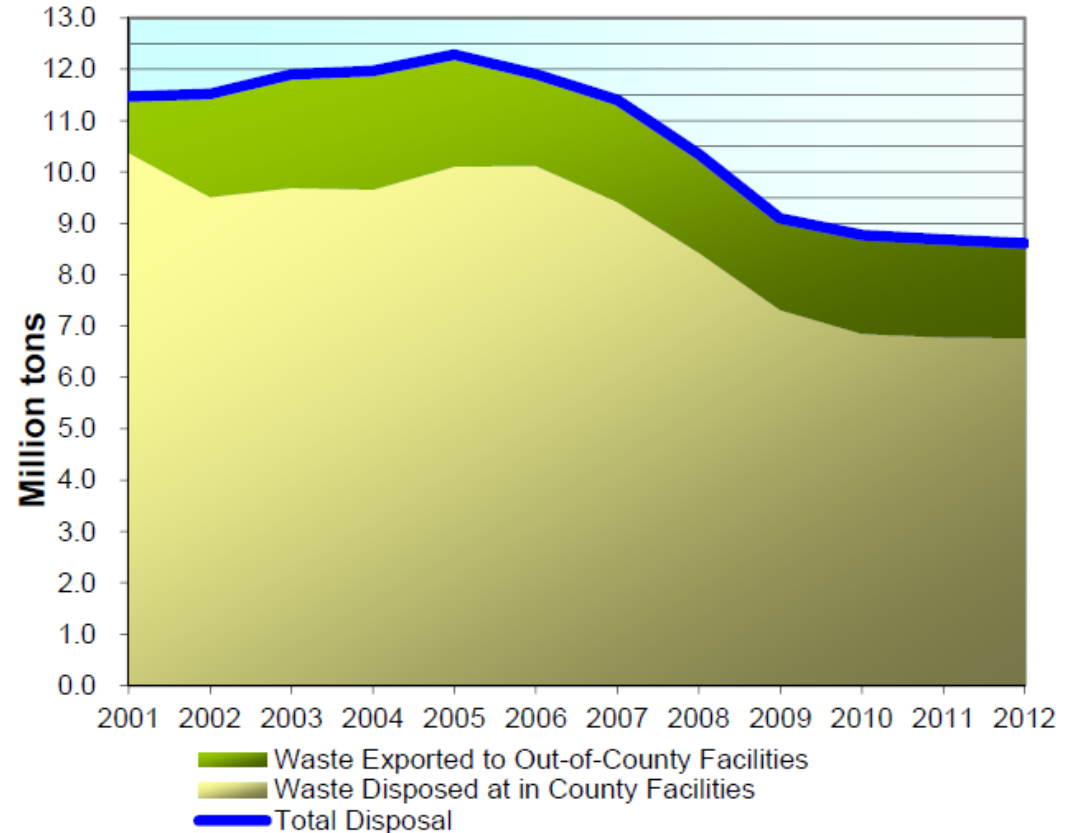
Biosolids

- Processed sewage-sludge (solids from water treatment)
- Much is exported to AZ
- City of Los Angeles applies in Kern County
- County of Los Angeles and IEUA compost in Rancho Cucamonga
- Not certifiable as organic – marketing problem



Landfill disposal in Los Angeles County

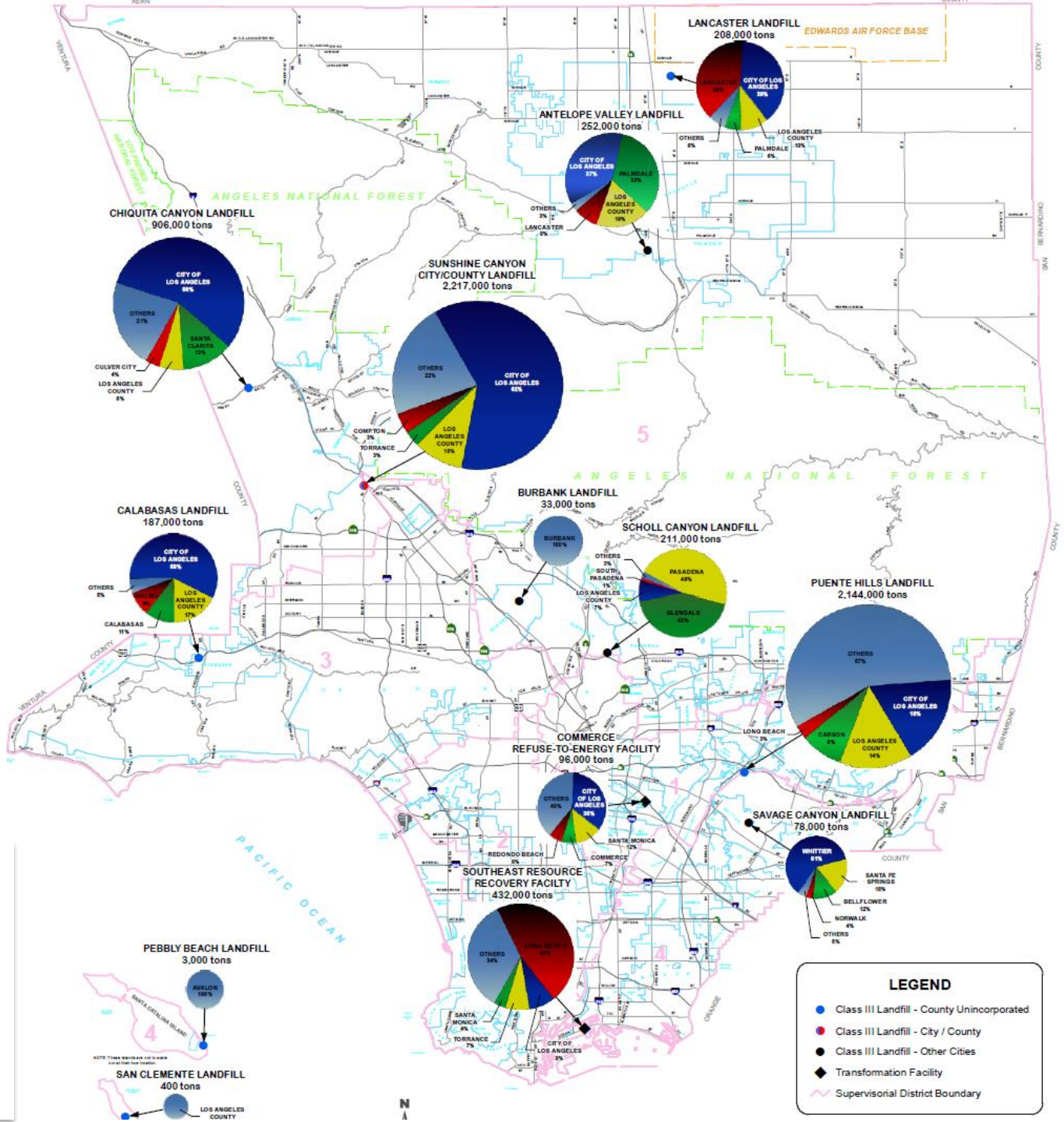
- Declines are typical during recessions
- Likely to pick up as economy improves



LA Co. Public Works, 2013

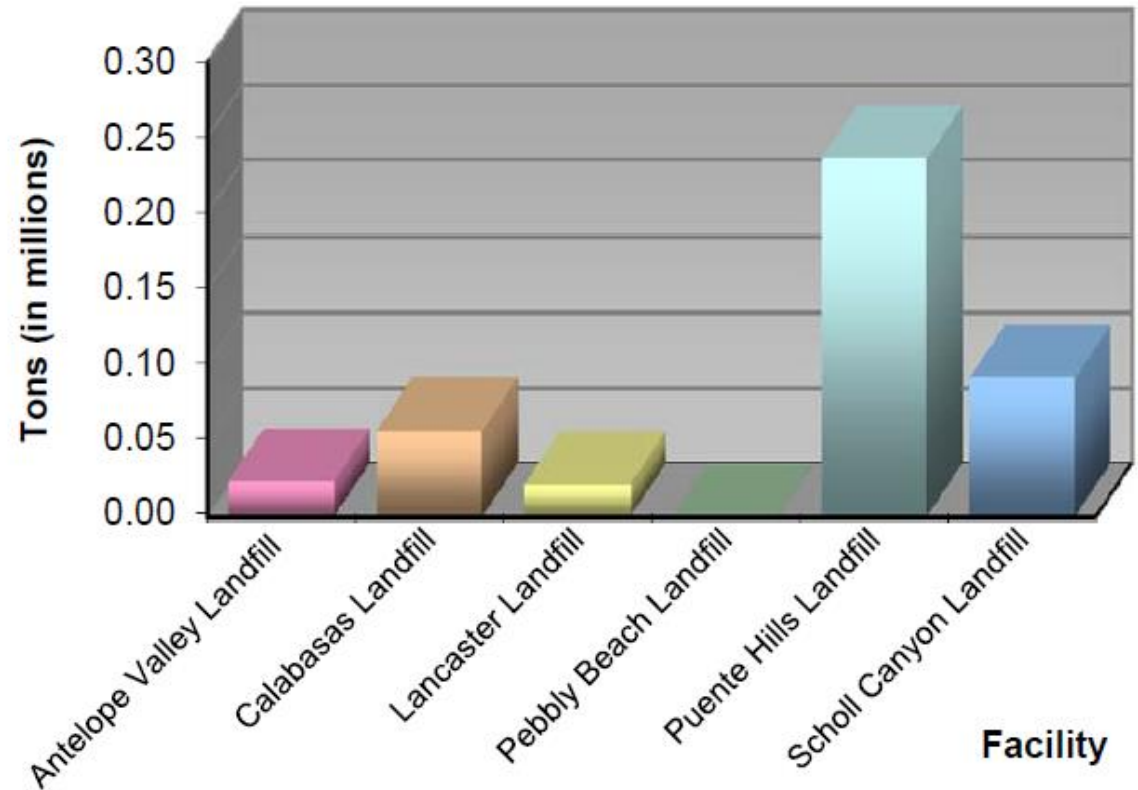
Landfill disposal in Los Angeles County

2012



Use of ADC in Los Angeles County - 2012

- More than half went to Puente Hills.
- Puente Hills closed Oct. 31, 2013.



LA Co. Public Works, 2013

Greenwaste: what now?





University of California
Agriculture and Natural Resources
Cooperative Extension

MANAGING THE PEST AND DISEASE RISK OF COMPOSTABLE WASTES

DAVID CROHN, JIM DOWNER, BEN FABER, STEVEN
SWAIN, DEB MATHEWS, AND MATT DAUGHERTY
SUPPORT THROUGH ANR

BACKGROUND

CalRecycle directed to increase landfill diversion rates to 75% by 2020

New environmental regs applied to compost but not to chip & grind (G&G) material

- Air (VOCs, ammonia)
- Water (nitrate)

Cost of compost likely to significantly increase compared to C&G



BACKGROUND

C&G may not be enough to eliminate pests reliably

Under California regs (Title 40)

- Compost MUST reach 55 ° C for AT LEAST 3 days
- C&G can NEVER reach 55 ° C and must be removed within 3 days of delivery

APPROACH

Consider WORST case for pest survival

- Insects
- Weeds
- Viruses
- Fungi

TREATMENTS

Size Reduction

- No Reduction
- Chipping
- Grinding

Temperature

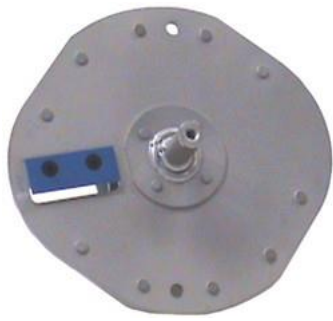
- 25 °C
- 55 °C

- Environment
 - Isolated
 - Compost
- Time
 - 0 days
 - 3 days

CITRUS SAMPLES







Chip & Grind

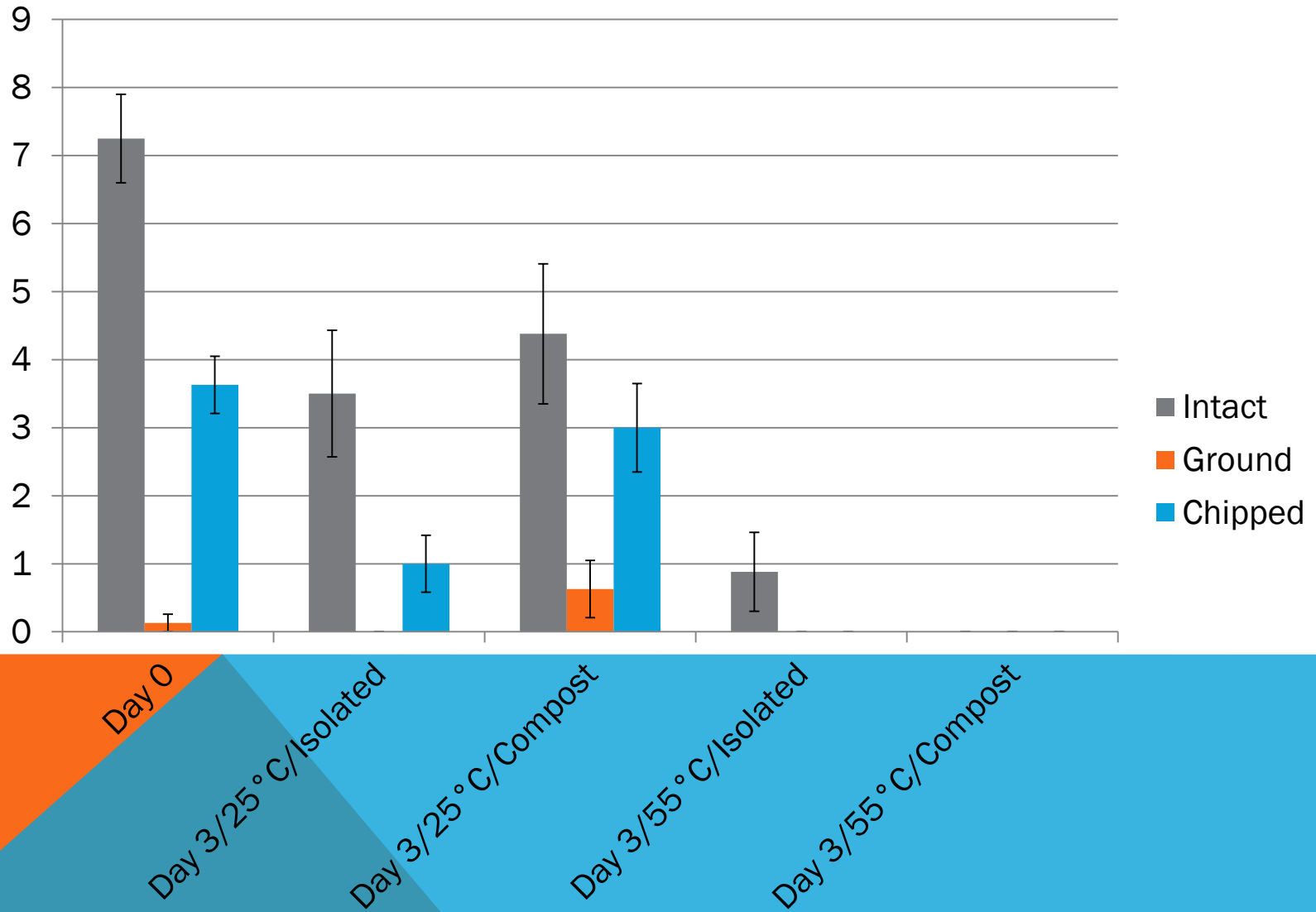


Chip

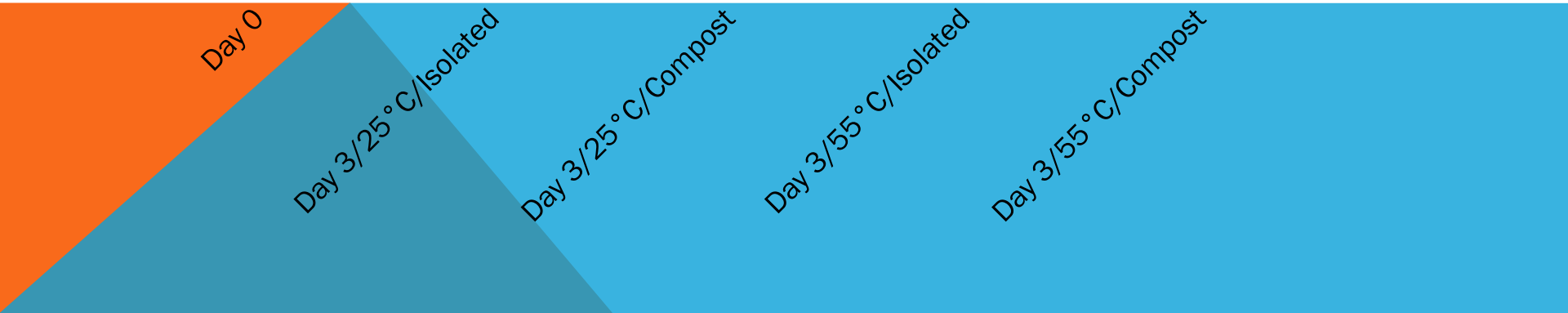
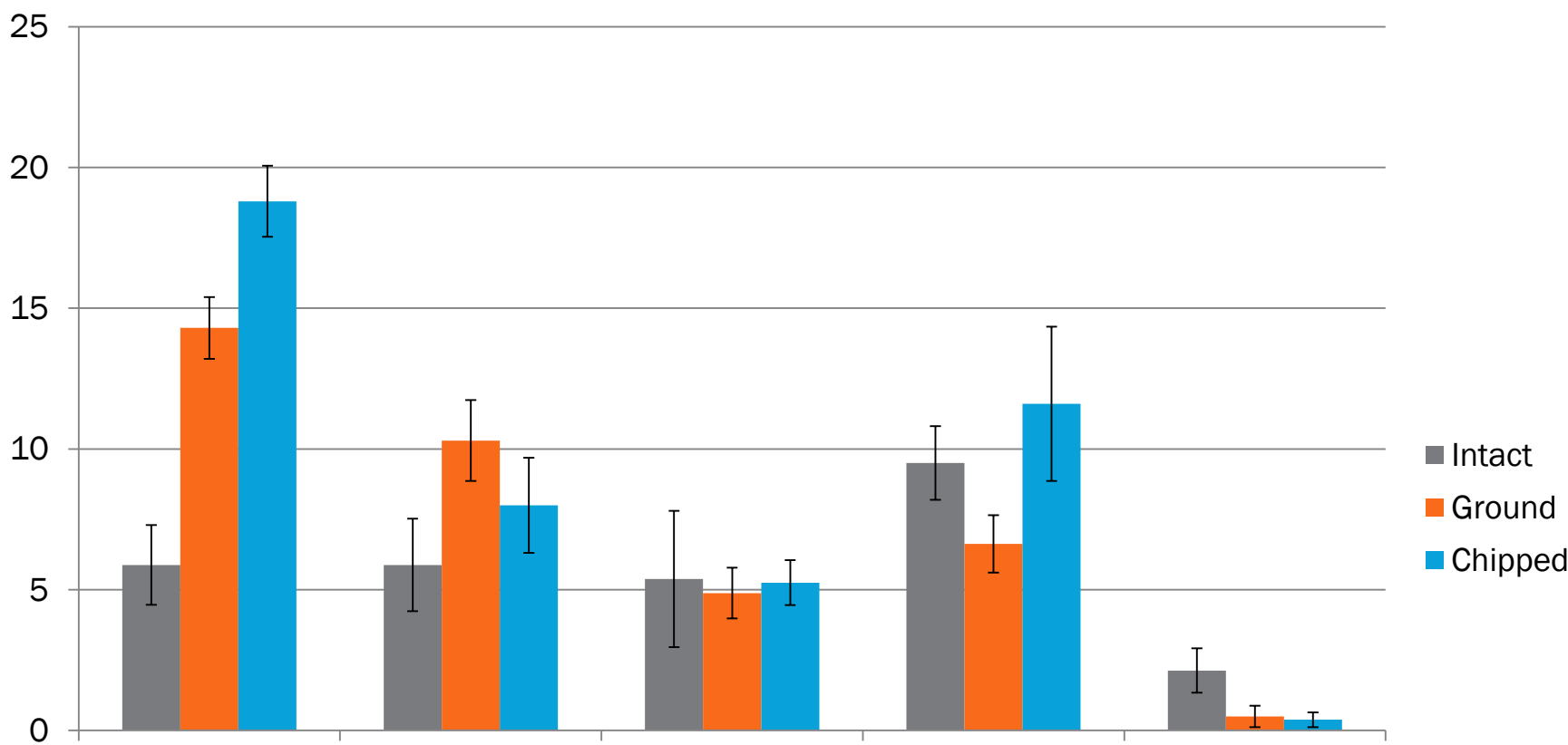
Grind



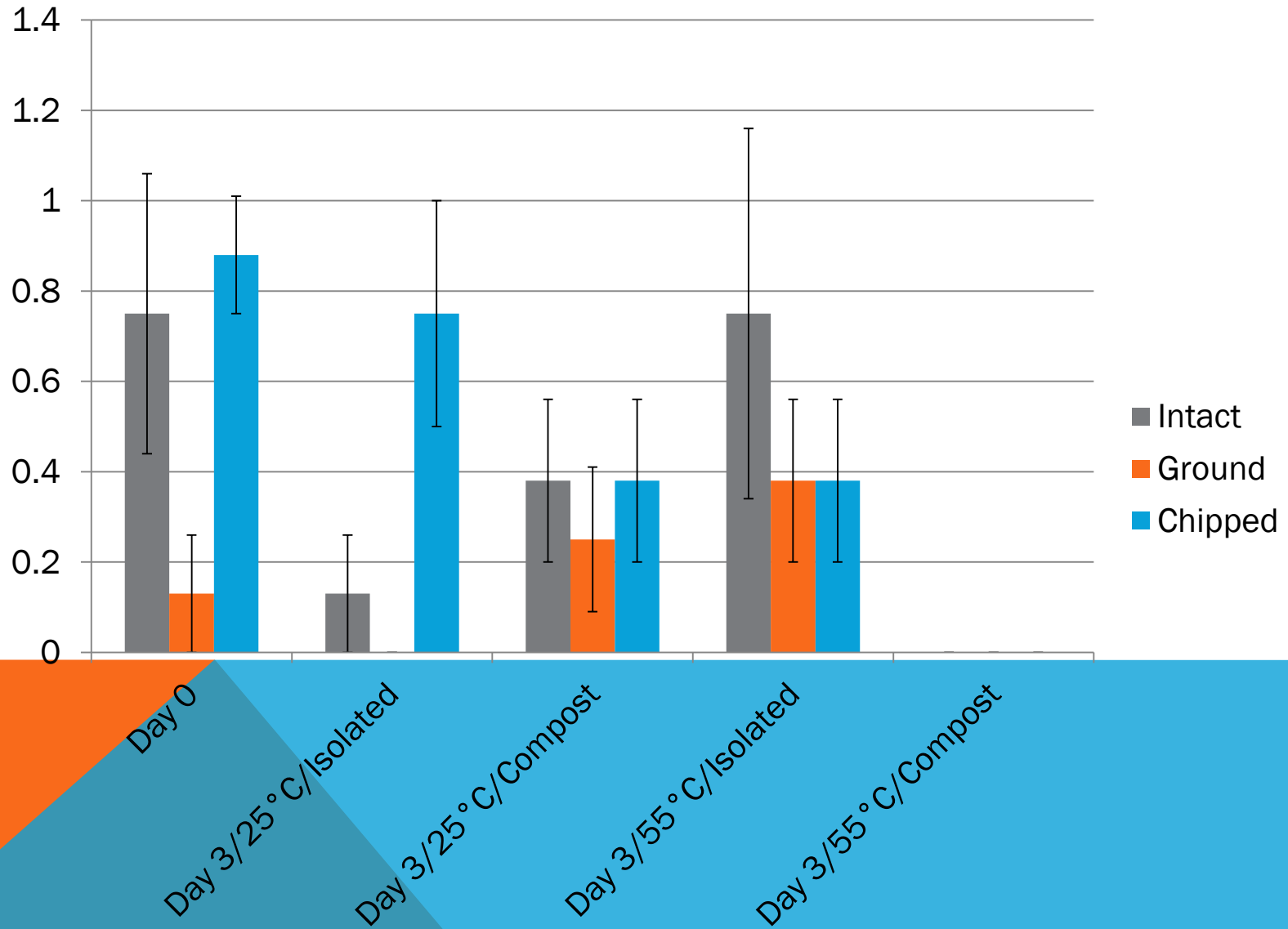
NUTSEGE



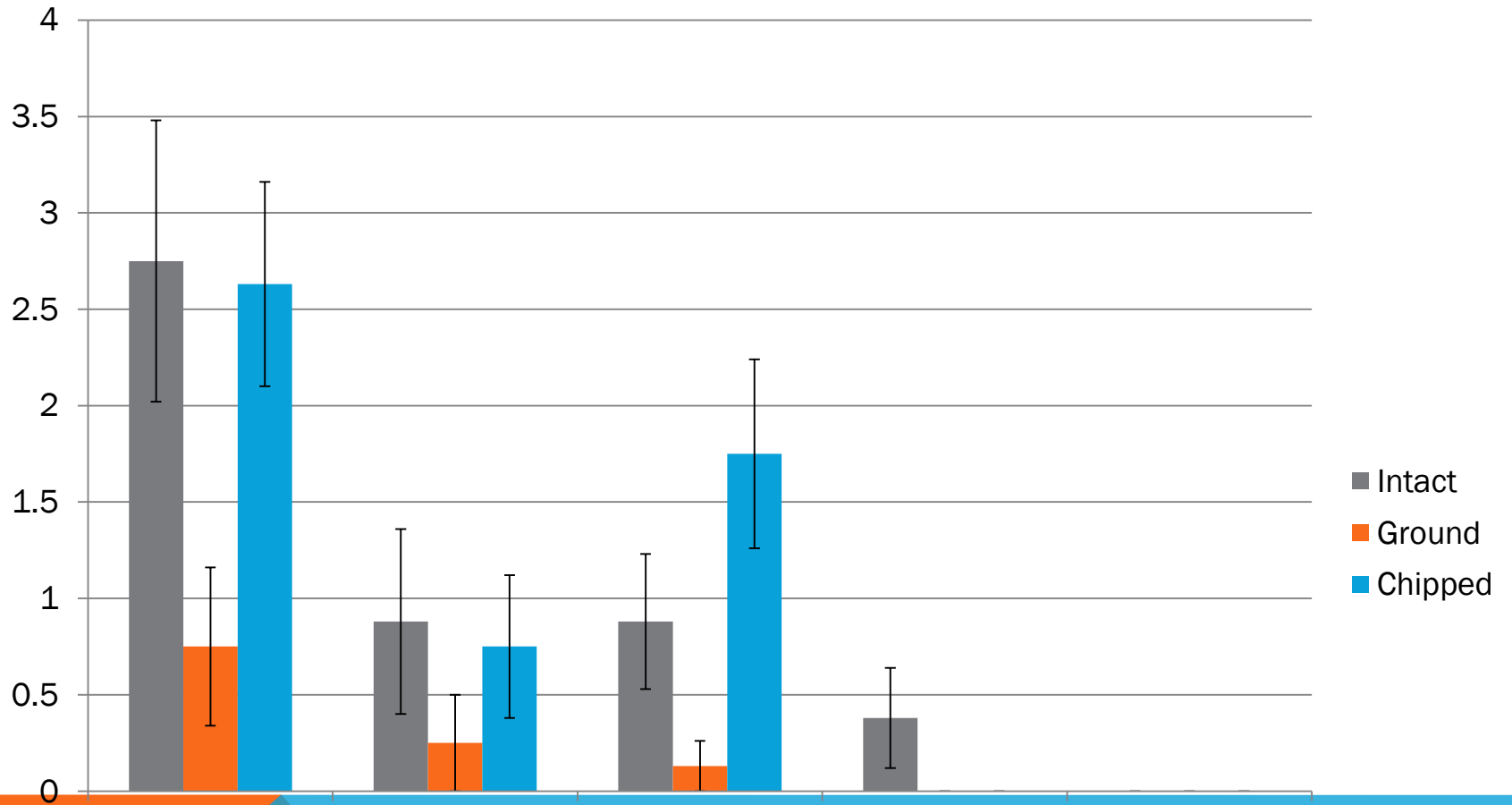
CLOVER



TOMATO



BERMUDAGRASS



Day 0

Day 3/25°C/Isolated

Day 3/25°C/Compost

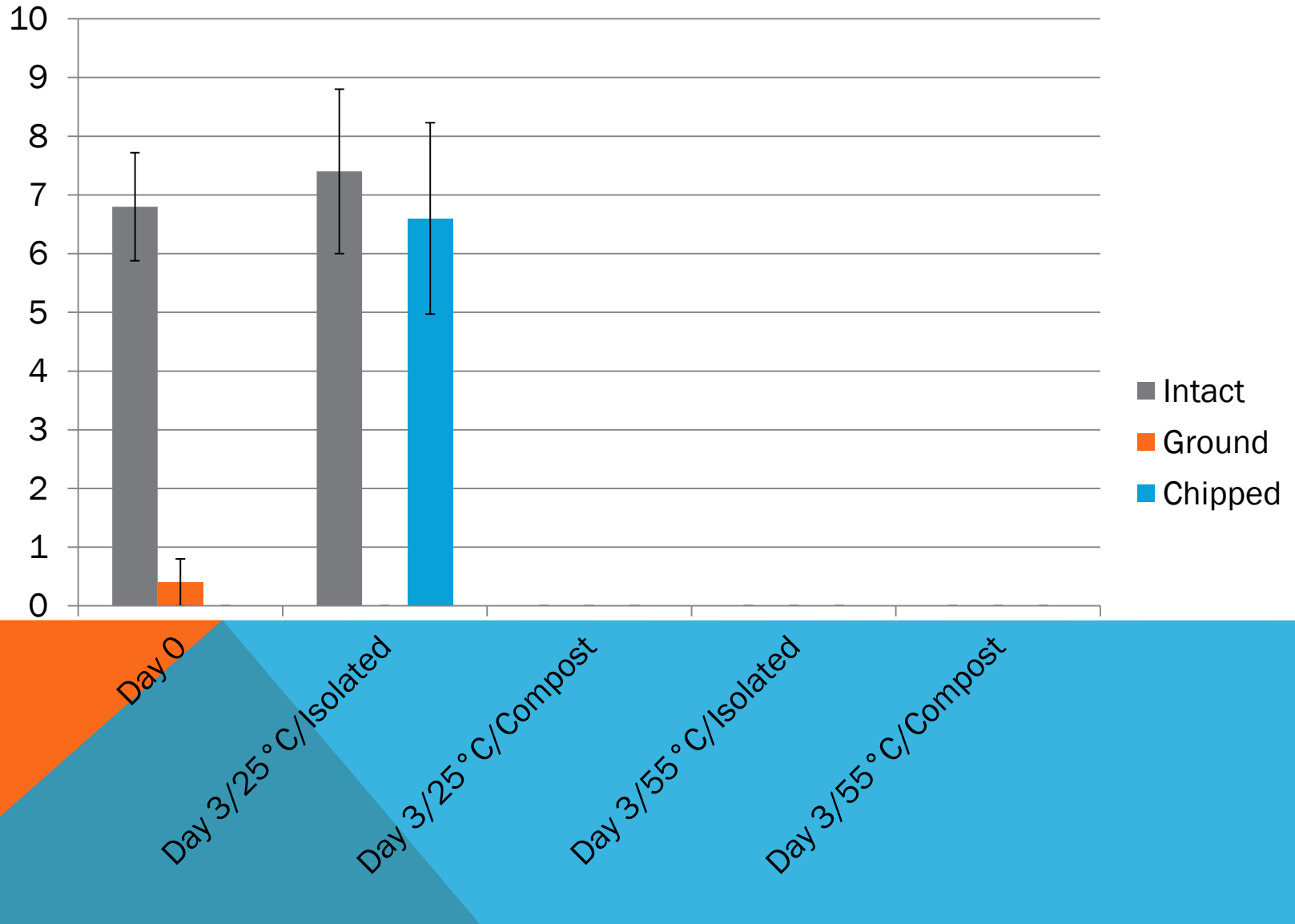
Day 3/55°C/Isolated

Day 3/55°C/Compost

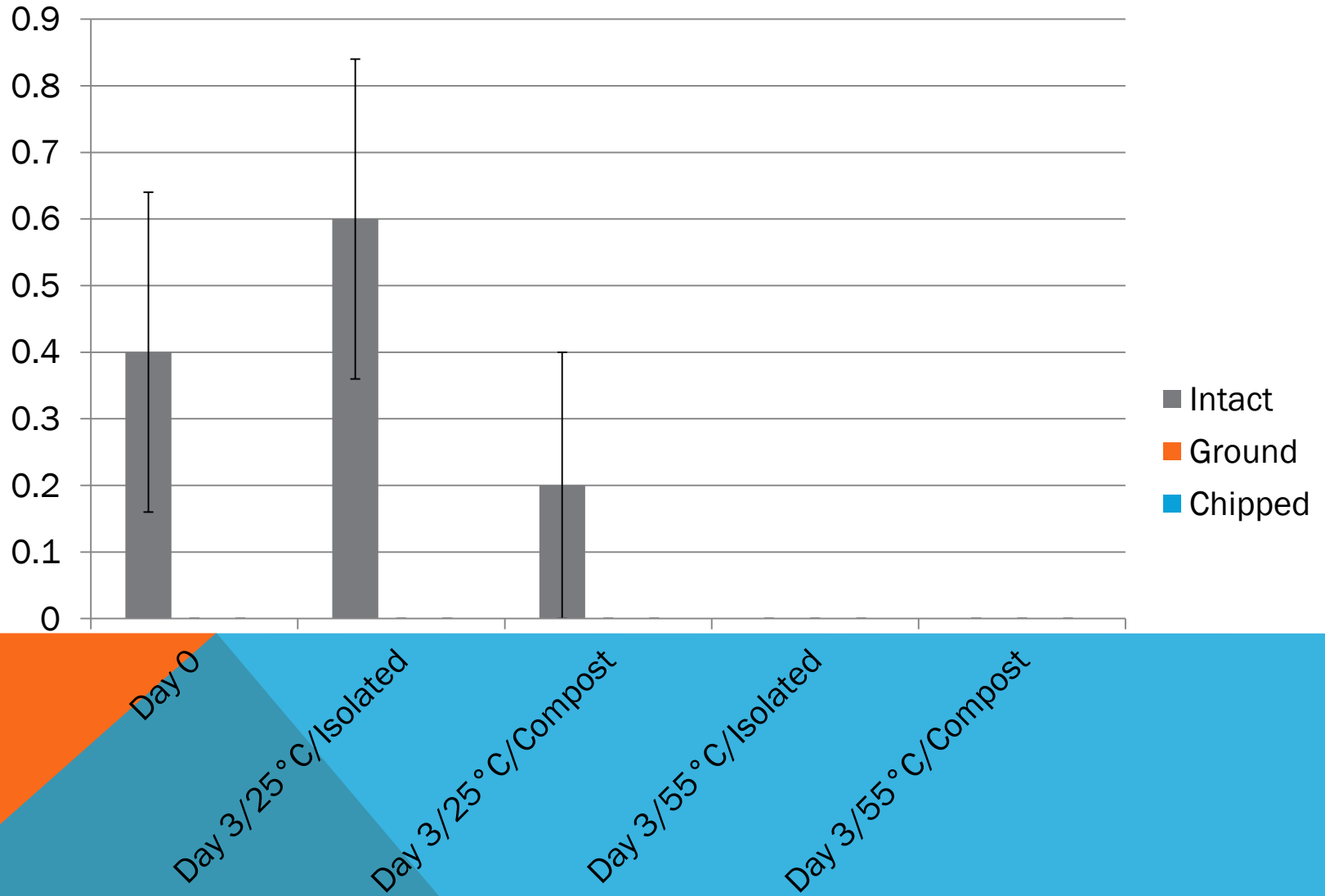


Insect cages

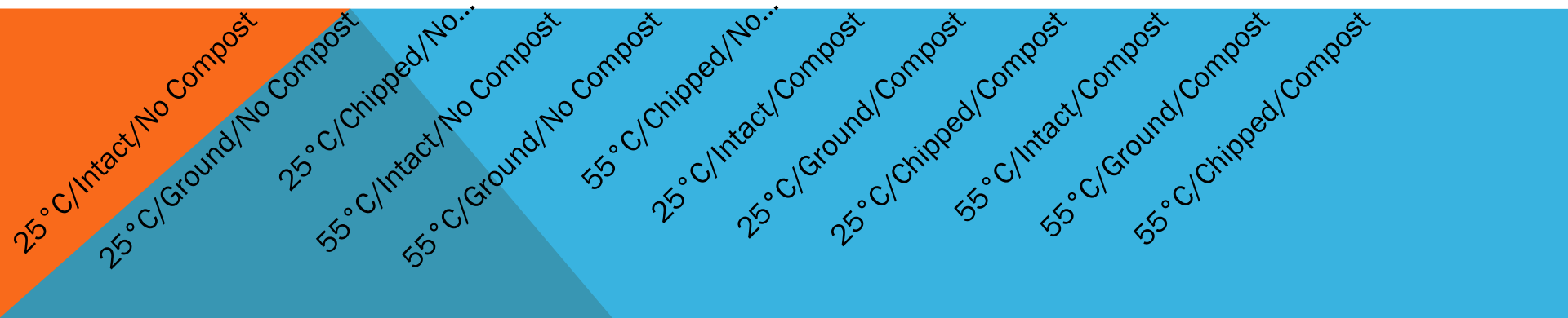
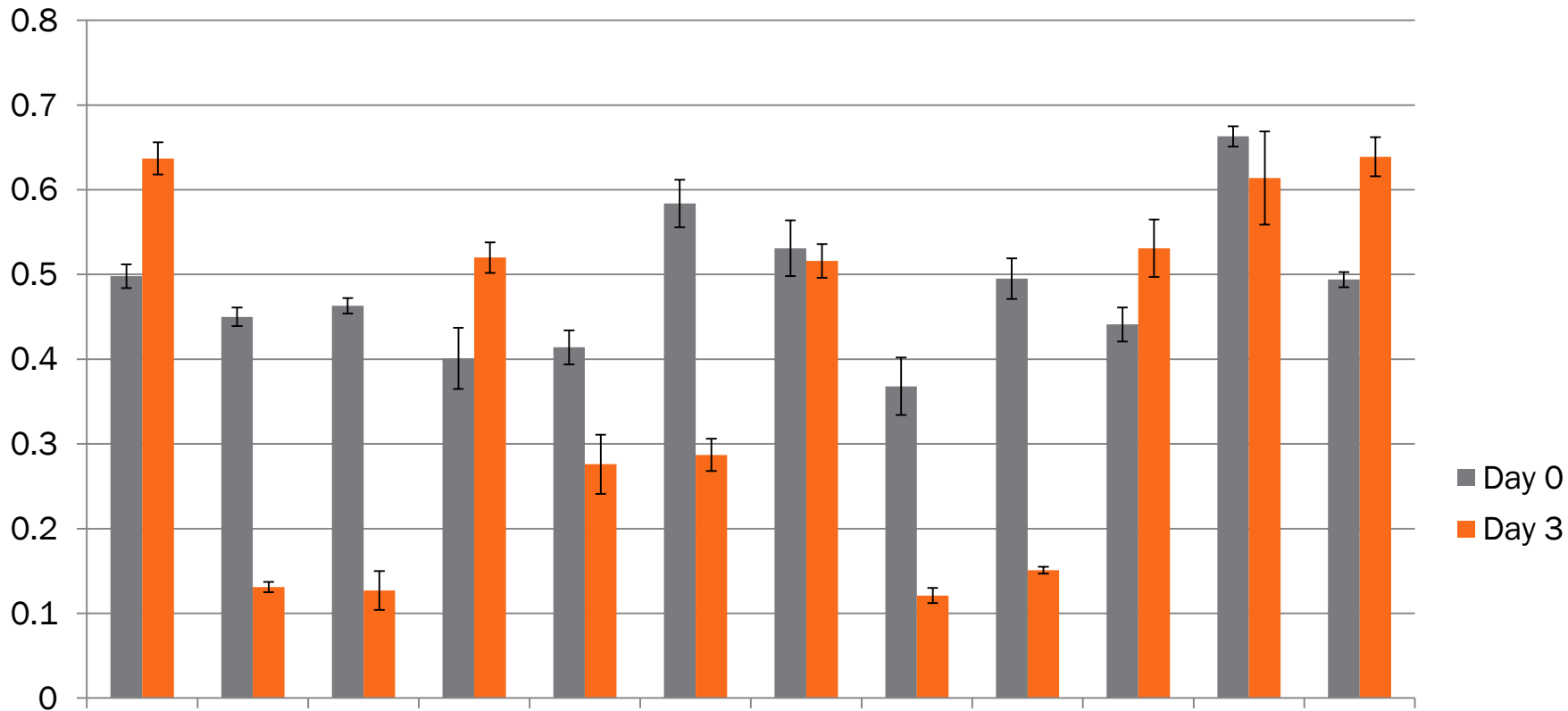
ACP ADULT



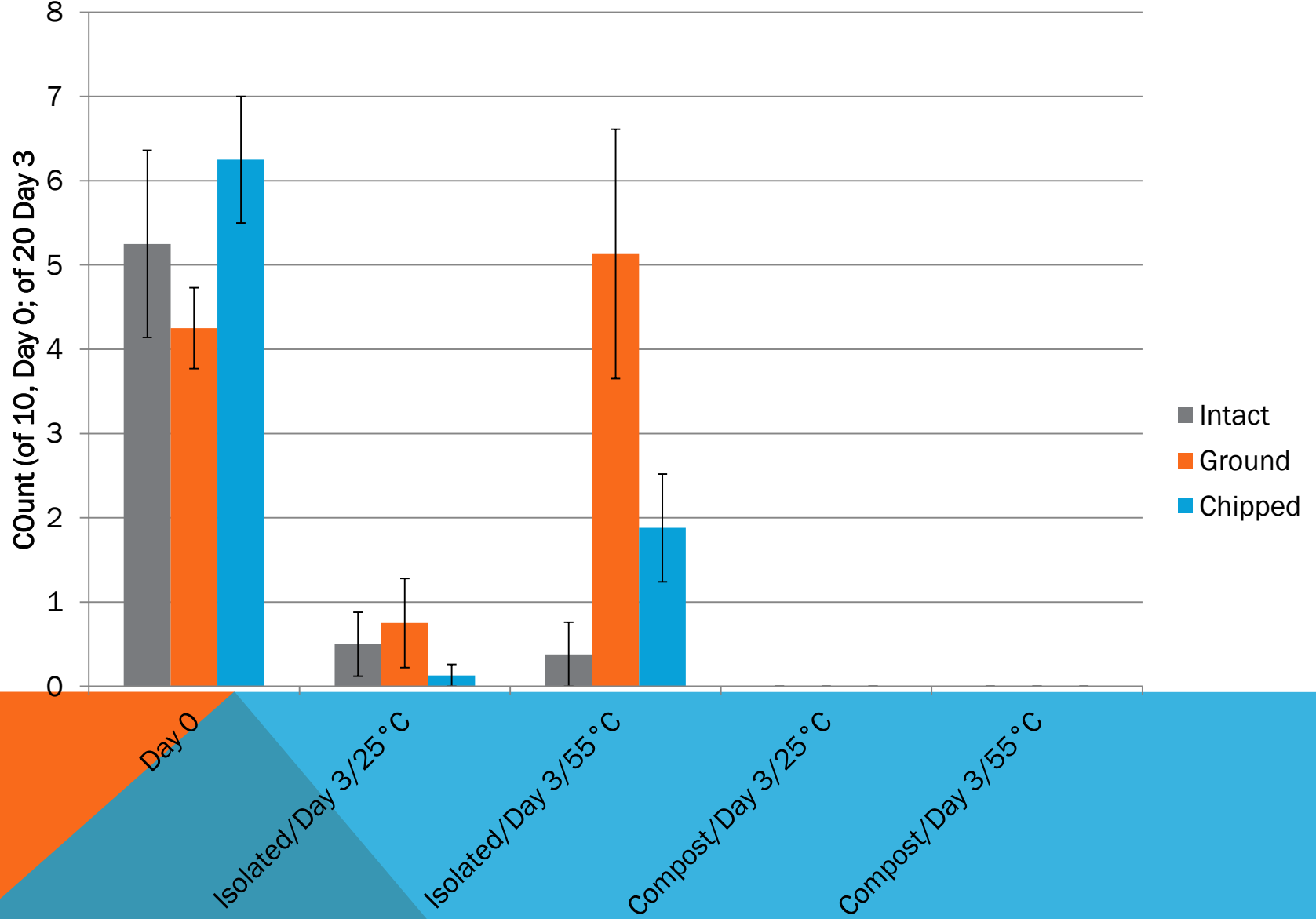
CITRUS LEAFMINER



TMV



FUSARIUM



CONCLUSIONS

There is evidence that concern is warranted

More research is needed into

- Different pests
- Field conditions
- Epidemiology
- Economics

