

Understanding and Managing Mango Fruit Drop

Insights from Research and Southwest Florida Growers

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Situation



*Is mango fruit
drop normal?*

*The short
answer is
YES... BUT...*

Natural
thinning
“normal” vs.
problematic
fruit drop the
affects yields

Why It Matters



Reduces marketable yield



Impacts profitability



Frustration among growers



Economic and
management implications
for growers and local
economies



Research says...

Too much/too little water

Nutrient deficiencies

Pest and disease pressure

Poor pollination

Plant hormones (low cytokinin)

Pollen viability

Environmental stress (rain, wind, storm)

Air temperature

Compounding and coupling of biotic and abiotic factors

See references page for cited research

Research says...

Flowering is a good sign, but doesn't determine fruit set

Flowering is a long, non-synchronized process

The number of fruits that set and mature is very small in relation to the number of flowers

Most varieties in Florida produce an average of less than one fruit per panicle.

Best Management Practices

Too little feeding or
overfertilizing

- Little to no nitrogen. 6-6-6-2, 6-3-16 and 0-0-22. Emphasize minor element nutrition. Annual foliar sprays of iron, zinc, boron, magnesium and manganese. Iron applied in non-chelated form as a dry material watered in 2 - 3 times yr.

Anthraxnose, powdery
mildew, low temperatures
along with heavy dew during
bloom reduce fruit set

- 1-2 early spring applications of sulfur and copper timed to begin when the panicle is 1/4 full size, then 10 to 21 days later improve chances for fruit set and production.

Too much/not enough water

- Little to no irrigation during the fall and winter. Irrigation on in spring. Once the rainy season arrives, irrigation frequency reduced or stopped.

Causes – *no BMPs available*

- * Lack of pollination
- * Low stigmatic receptivity
- * Defective perfect flowers
- * Poor pollen transference
- * Abortion of embryo
- * Degeneration of ovules
- * Drought



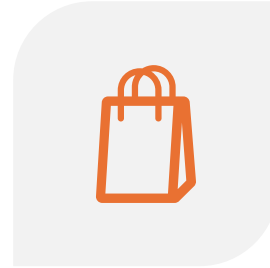
Even larger challenges beyond our control



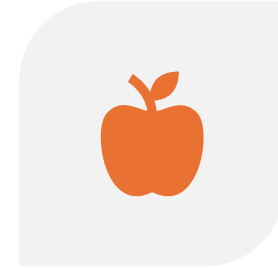
HURRICANES



COLD SNAPS



MICROCLIMATES



VARIETIES

Steve Cucura, FruitScapes

10 acres farm/nursery, farm stand

Crop observations:

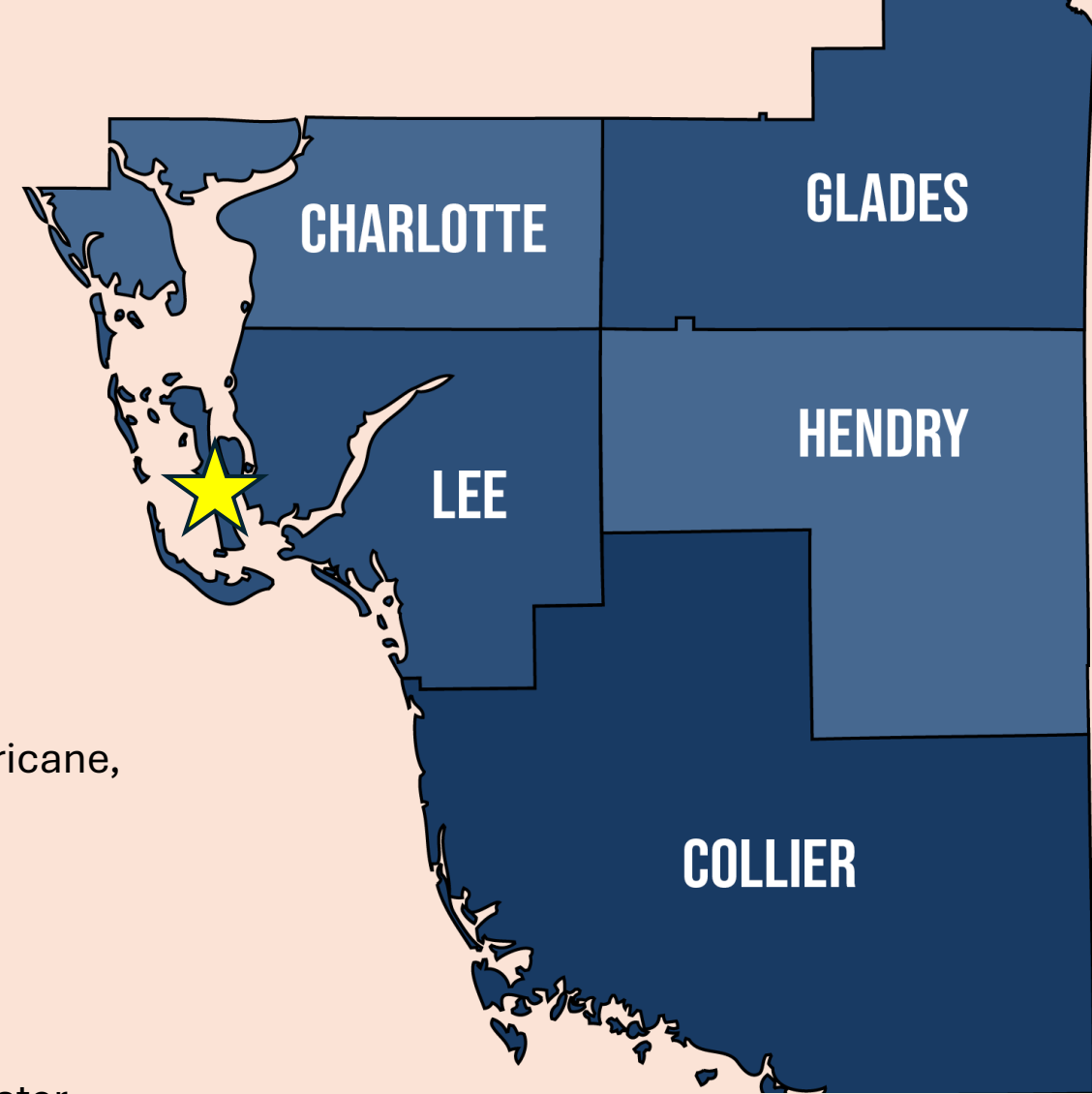
- Bad mango season overall
- Repeated blooms (3) : only the second bloom set fruit
- Cold snaps cause internal damage to pea-sized fruit
- Last stage of flowering is often affected by fungal disease
- Sprays may reduce fungus, but also deter pollinators; trade-off

Perspective on Fruit Drop:

- Pollination impacted by late hurricane: low insect activity post-hurricane, cold and DRY temperatures (insect population in drought)
- Drop is natural and unavoidable: wind, animals, fungal damage
- Cold is the biggest factor for fruit production/retention

Growing Conditions:

- Microclimate: water is not the problem of farm w/shallow groundwater
- Tommy Atkins most tolerant variety to local conditions on Pine Island
- Mango production is highly variable across regions
- Advocates for regional diversification—you never know which area will have the best year



Marley Hagerstrom, Naples Fruit Farm

10-year-old grove, 5 acres, incredible genetic variety

Crop observations:

- Poor first fruit set, second bloom was successful
- April brings strong winds and drought, contributing to drop

Management Practices:

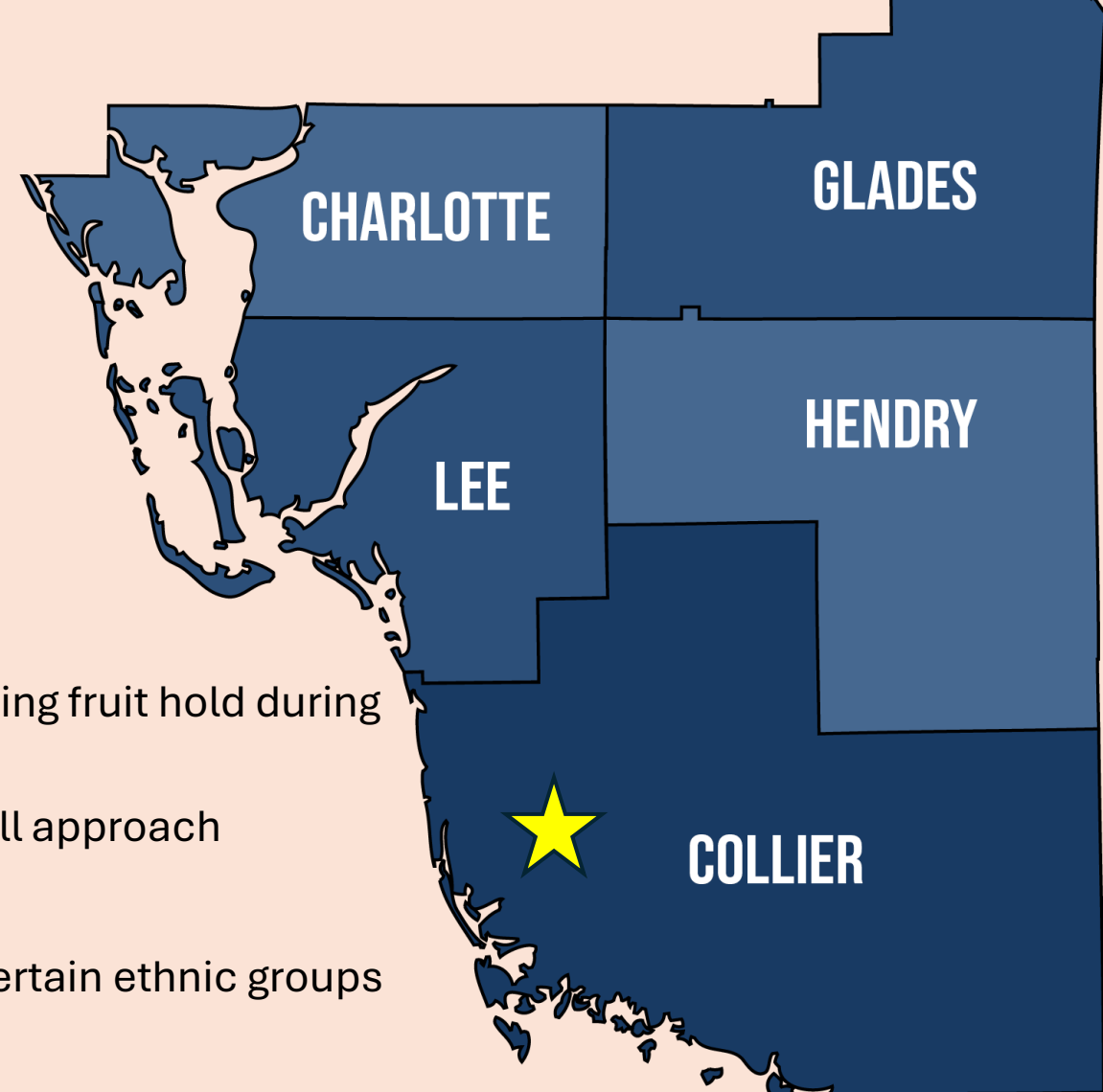
- Irrigation in place before drought helped reduce loss
- Spraying trees with micronutrients/fungicides in Jan./Feb.
- Irrigation improves connection between fruit and panicle, helping fruit hold during wind
- Management tailored to each microclimate; no one-size-fits-all approach

Marketing & Opportunity:

- Potential market for small fruit (e.g., green mangoes) among certain ethnic groups
- Suggests more investment in boutique marketing strategies
- Unique value of Florida mangoes and genetics, should be marketed accordingly

Additional notes:

- Learns not to dwell on fruit loss—accept it as part of the process



Wayne Simmons, LaBelle Fruit Company

12-year-old grove 3–4 acres of mango, 300+ acres citrus

Last year yielded around 20,000 lbs

Crop observations:

- Cold temperatures (below 40°F, especially 35–45°F) in Feb. affected fruit set
- Limited rainfall since late October hurricane; continued dry weather
- Fungus not a major issue for this grove, consist spraying
- Fruit set depends on timing of bloom/environmental conditions than variety
- Early blooms are performing better than late blooms (April underperformed)
- Erratic fruit set attributed to cold spells

Production notes:

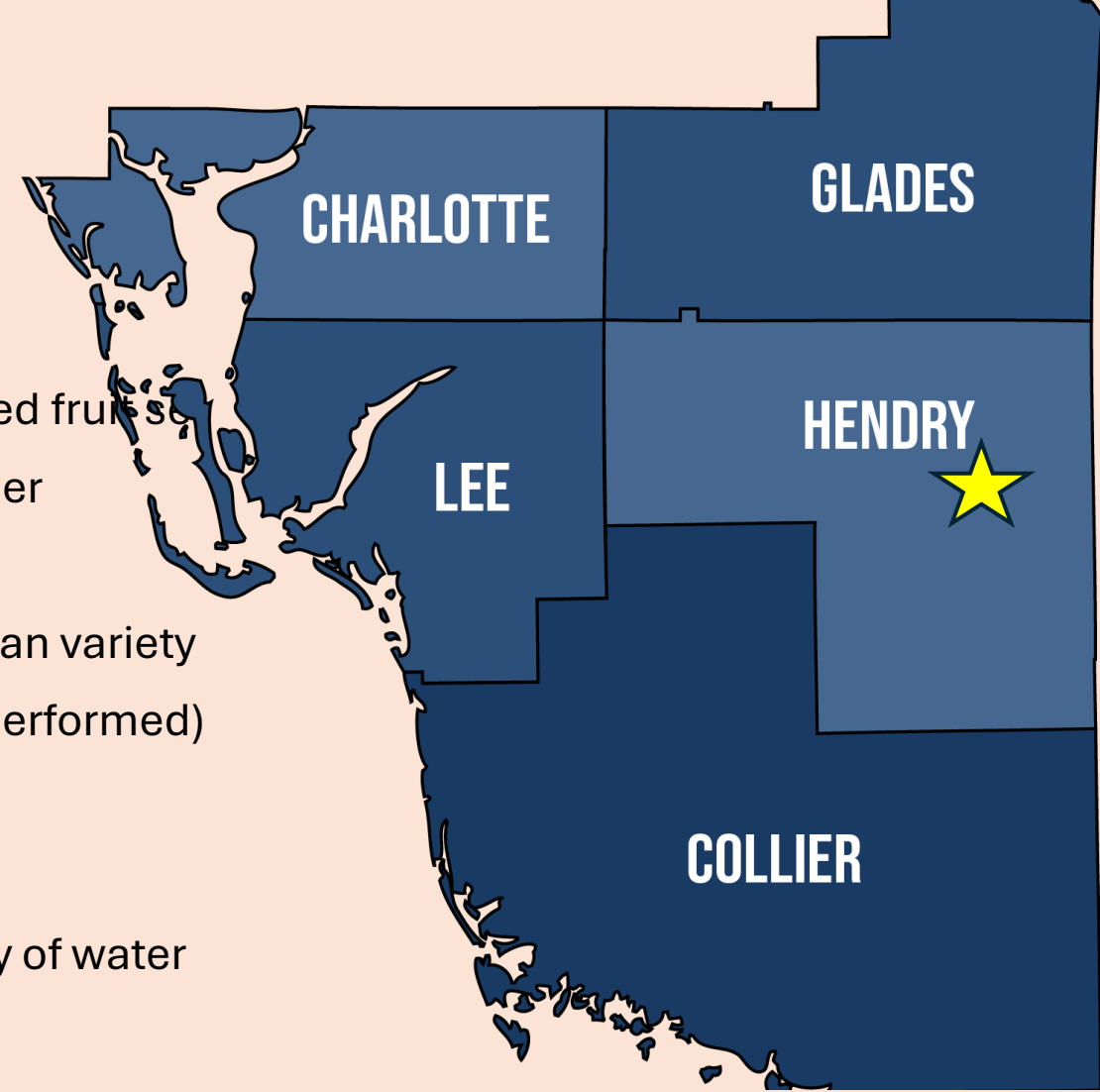
- Best results: fungicide after fruit set, nutritional treatments, plenty of water

Market insights:

- Excellent fruit quality
- Fruit sells very well, especially to Hispanic and Asian/Indian markets

Additional note:

- Opportunity exists for research on bloom timing/environmental impact on fruit set



Take-home messages



“Fruit drop and low production are due to poor pollination. Water isn't the issue—cold weather and a lack of pollinators are to blame. The hurricane came late, and the insect population didn't recover during the cold months of December, January, and February.”



“When hurricanes come through, you never know *which* system it's going to be impacted. You know it's going to impact *some* system, but which one, we're not sure yet.”



“You learn to focus on what you can control. I fixed the irrigation during the drought and it helped reduce fruit drop by keeping the fruit and panicle connection stronger, more flexible when the April winds hit.”

Grower
Summary
Best
Management
Practices
(*What can be
controlled*)

Irrigation: consistent moisture
reduces stress

Fertilization: balanced nutrients,
especially during flowering and fruit
set

Pest & Disease Control: mango
scale, anthracnose, and powdery
mildew

Grower Summary: What Can't be Controlled

Weather events (wind, cold, rain, drought during flowering and setting)

Environmental response from hurricanes; which part of the ecosystem they disrupt are unpredictable

Pollinator availability

Tree genetics and varietal differences

Limits of management but response is key

Summary



Mango fruit drop is complex but manageable



Integrating best practices and IPM improves chances of successful crop



Regular monitoring of inputs & grove management



Adaptive management = best outcomes (trial and error)



Collaborating with other growers



No "silver bullet" solution



Opportunity for more on-farm research throughout region

References

Crane, J., Wasielewski, J. *Mango Growing in the Home Landscape UF/IFAS Extension.*
<https://edis.ifas.ufl.edu/publication/MG216>

Kumar, A., Bhuj, B. D., & Singh, C. P. (2021). *FRUIT DROPS IN MANGO: A REVIEW. Annals of the Romanian Society for Cell Biology*, 25(6), 925-946. Retrieved from
<https://login.lp.hscl.ufl.edu/login?url=https://www.proquest.com/scholarly-journals/fruit-drops-mango-review/docview/2584789322/se-2>

Anila, R., & Radha, T. (2006). Studies on fruit drop in mango varieties. *Journal of Tropical Agriculture*, 41, 30–32. Retrieved from <https://jtropag.kau.in/index.php/ojs2/article/view/93>

Spreer, W., Ongprasert, S., Hegele, M., Wünsche, J. N., & Müller, J. (2009). Yield and fruit development in mango (*Mangifera indica* L. cv. Chok Anan) under different irrigation regimes. *Agricultural Water Management*, 96(4), 574–584. <https://doi.org/10.1016/j.agwat.2008.09.020>

Kumar, A., Bhuj, B. D., & Singh, C. P. (2021). Fruit drops in mango: A review. *Annals of the Romanian Society for Cell Biology*, 25(6), 925–946.

Questions?

