2022

Proceedings of the 2022 Passion fruit Conference: Growing the U.S. Passion Fruit Industry A Strategic Conference for: Growers, Marketers, Researchers, and Stakeholders

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Proceedings

of the

2022

Passion fruit Conference

Growing the U.S. Passion Fruit Industry

A Strategic Conference for: Growers, Marketers, Researchers, and Stakeholders

June 14 and 15

University of Florida

Tropical Research and Education Center

Homestead, Florida

Editor

Dr. Eric T. Stafne,

Mississippi State University

Contributors

- Josh Anderson, University of Florida
- Mark Bailey, University of Florida
- Bob Balaam, USDA APHIS PPQ
- Fredy Ballen, University of Florida
- Dr. Matthew Blair, Tennessee State University
- Dr. Trent Blare, University of Florida
- Dr. Daniel Carrillo, University of Florida
- Dr. Alan Cambers, University of Florida
- Dennis Chant, Passion Fruit Australian Inc.
- Dr. Dario Chavez, University of Georgia
- Jacky and Ben Chen
- Victor Contreras, University of Florida
- Dr. Jonathan Crane, University of Florida
- Dr. Laura Downey, Mississippi State University
- Dr. Manjul Dutt, University of Florida
- Ben Faber, University of California
- Ellen Garcia, University of Florida
- Dr. Romina Gazis, University of Florida
- Johnny Hoblick, AgriStarts
- Charles LaPradd, Miami-Dade County
- Ken Love, Hawaiian Tropical Fruit Growers
- Allen Owings, Bracy's Nursery
- Dr. Pablo Morales-Payan, University of Puerto Rico
- Robert Petrucci, Fresh Gardens
- Dr. Ben Posadas, Mississippi State University
- Rane Roatta, Miami Fruit LLC
- Osvany Rodriguez, O&A Farms
- Dr. Steven Sargent, University of Florida
- Dr. Dara Stockton, USDA-ARS, Hilo, HI
- Erik Tietig, Pine Island Nursery
- Jeff Wasilewski, University of Florida
- Haley Williams, Mississippi State University
  Ashraf Zaki, USDA Specialty Crops News

Introduction

We are pleased to deliver these proceedings of the passion fruit conference that was held in Homestead, Florida on June 14 and 15, 2022. It was a culmination of a lot of hard work by many people, most of them listed in the previous page. However, it would not have been a success without the attendees who came from various parts of the country to share their experiences growing passion fruit.

What follows in these proceedings are the slides of the presentations with by notes taken by attendees Haley Williams, Dara Stockton, Pablo Morales-Payan, and Josh Anderson. Also included are the notes taken of discussion regarding the five priority topic areas: Breeding/Genetics, Insect/Disease, Horticulture Production, Marketing/Economics, and Extension/Education.

While these proceeding constitute a record of what transpired over those two days, it is not the end of the discussion. Moving forward we hope to engage you all on the best direction to take for more and better passion fruit production in the United States, as well as collaborating with others in other countries. To do this, we will need your continued support and future assistance.

To conclude, we wish to thank everyone who participated in the conference. Please read these proceedings and let us know how we can help you. We are committed to research, teaching, and outreach for passion fruit in the U.S. and beyond. Feel free to contact me at any time.

Eric Stafne

Mississippi State University

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This work is supported by the Specialty Crops Research Initiative [grant no. 2021-51181-35867/project accession no. 1027445] from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

DAY 1	**JUNE 14, 2022**
8:30-8:50 AM	Welcome, introductions, and objectives: **Stafne** (MSU) and **Crane** (UF)
8:50-9:00	**Charles LaPradd** (5-10 minutes) Agriculture Manager Miami-Dade County Department of Regulatory & Economic Resources
9:00 AM	Overview and Discussion of Stakeholder Survey Results **Downey** (MSU)
9:45 AM	Coffee break (provided)
10:00 AM	Industry perspectives: presentations by marketing and shipping representatives addressing challenges and opportunities for the wholesale fresh-market and processing industries **Johnny Hoblick** – AgriStarts (10 minutes) **Rane Roatta** – Miami Fruit (10 minutes)
11:00 AM	Growers' perspectives: presentations about the biggest challenges and opportunities of the horizon **Ken Love --** Hawaiian Tropical Fruit Growers "**Liliko'i (passion fruit) production in Hawai'i"** (15-20 minutes)
12:00 PM	Lunch (provided) Shiver's BBQ
1:00 PM	Field trip to local passion fruit producers **Osvany Rodriguez** **Jackie Chen**
4:00 PM	Reconvene group for discussion and recap
5:00 PM	End for day (dinner on own)
DAY 2	**JUNE 15, 2022**
8:00 AM	Recap of day 1: **Stafne** (MSU)
8:45 AM	Breakout groups based on focus areas (breeding and genetics, pests and disease, production horticultural management, marketing, and extension) with industry stakeholders as available **Breeding/Genetics – Josh Anderson/Manjul Dutt** **Pest/Disease – Romina Gazis/Daniel Carrillo/Dara Stockton** **Horticulture Production – Jonathan Crane/ Jeff Wasilewski** **Marketing – Trent Blare/Fredy Ballen** **Extension/Education – Eric Stafne/ /Mark Bailey** **Online – Laura Downey/Ben Posadas**
9:45 AM	Coffee break (provided)
10:00 AM	Reports from first breakout groups to whole team

10:45 AM	Reconfigure breakout groups based on production region to allow participation by others in different focus groups
12:00 PM	Lunch (provided) TBA
1:00 PM	Reports from second breakout groups to whole team
2:00 PM	Group discussion on common ground and opportunities for an USDA-NIFA-SCRI SREP or CAP proposal
3:00 PM	Presentations on current research and extension efforts related to passion fruit
3:00-3:10	**Passion Fruit Import Summary**, B. Balaam, National Operations Manager – Exclusion & Imports, USDA APHIS PPQ Field Operations (10 minutes)
3:10-3:20	**USDA, AMS, Specialty Crops Market News Division: The Eyes and Ears of American Agriculture,** A. Zaki, National Shipping Point Supervisor, USDA Specialty Crops Market News (10 minutes, virtual)
3:20-3:30	**Status of conventional and organic pest control for U.S. passionfruit,** J. Crane, University of Florida (10 minutes)
3:30-3:40	**Passion Fruit Stem Canker,** J. Anderson, University of Florida (10 minutes)
3:40-3:50	**Seed Structure Differences and Genetic/Phenotypic Variability Amongst Colombian Accessions of Purple Passion Fruit, *Passiflora edulis* f. e*dulis*** N. Rodriquez, L. Melgarejo, D. Demissie, and M. Blair*, Tennessee State University (10 minutes)
3:50-4:00	**Establishing Gene Editing Technology to Generate Seedless Passion Fruit**, E. Garcia, A. Chambers, and T. Liu, University of Florida (10 minutes)
4:00-4:10	**Tools to analyze your passion fruit enterprise's profitability**, V. Contreras, University of Florida (10 minutes)
4:10-4:20	**How to market in a digital era**, T. Blare, University of Florida (10 minutes)
4:20-4:35	**Promoting the Sustainability of the Passionfruit Industry in Australia**, D. Chant, Passion Fruit Australian Inc. (15 minutes, virtual)
4:35-5:00	**Questions**
5:15 PM	Closing remarks and next steps: **Stafne** (UA) and **Crane** (UF)
5:30 PM	End of meeting

Passionfruit Survey Results

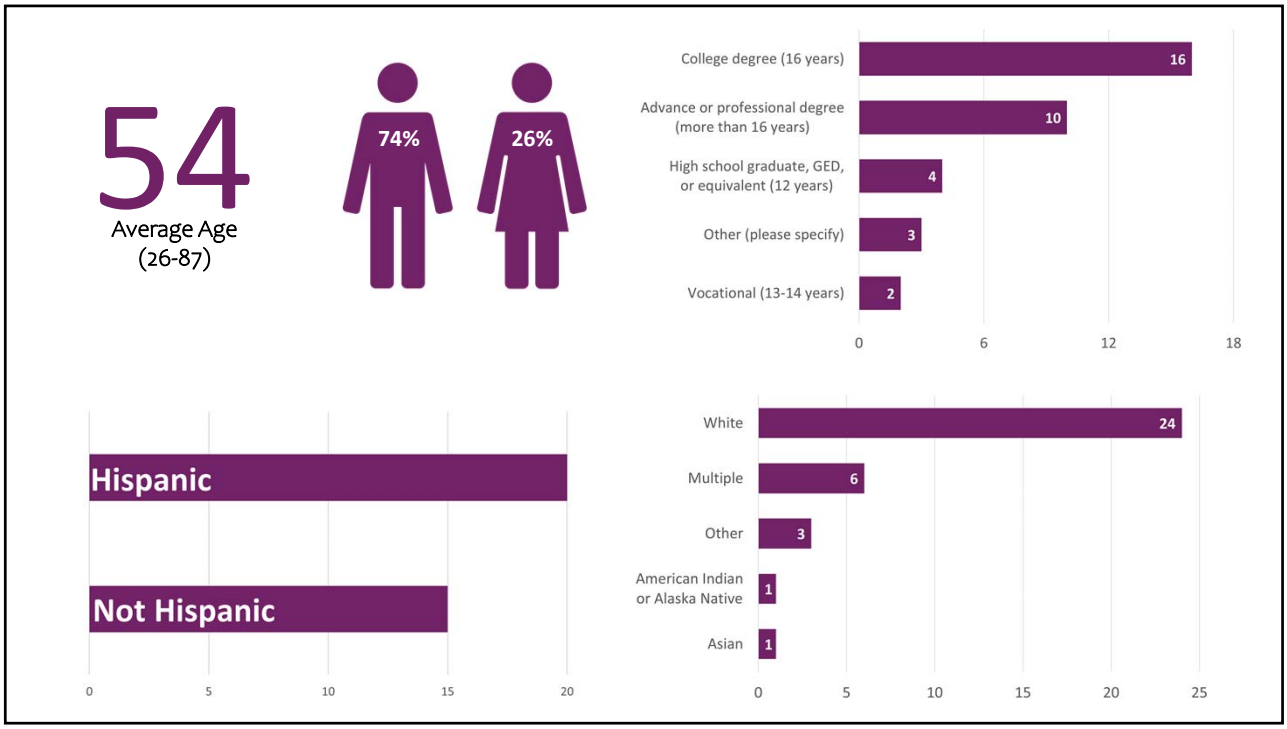
Dr. Laura H. Downey, Evaluation Specialist
&
Ms. Tia Gregory, Data Management Coordinator
Mississippi State University Extension Service

1

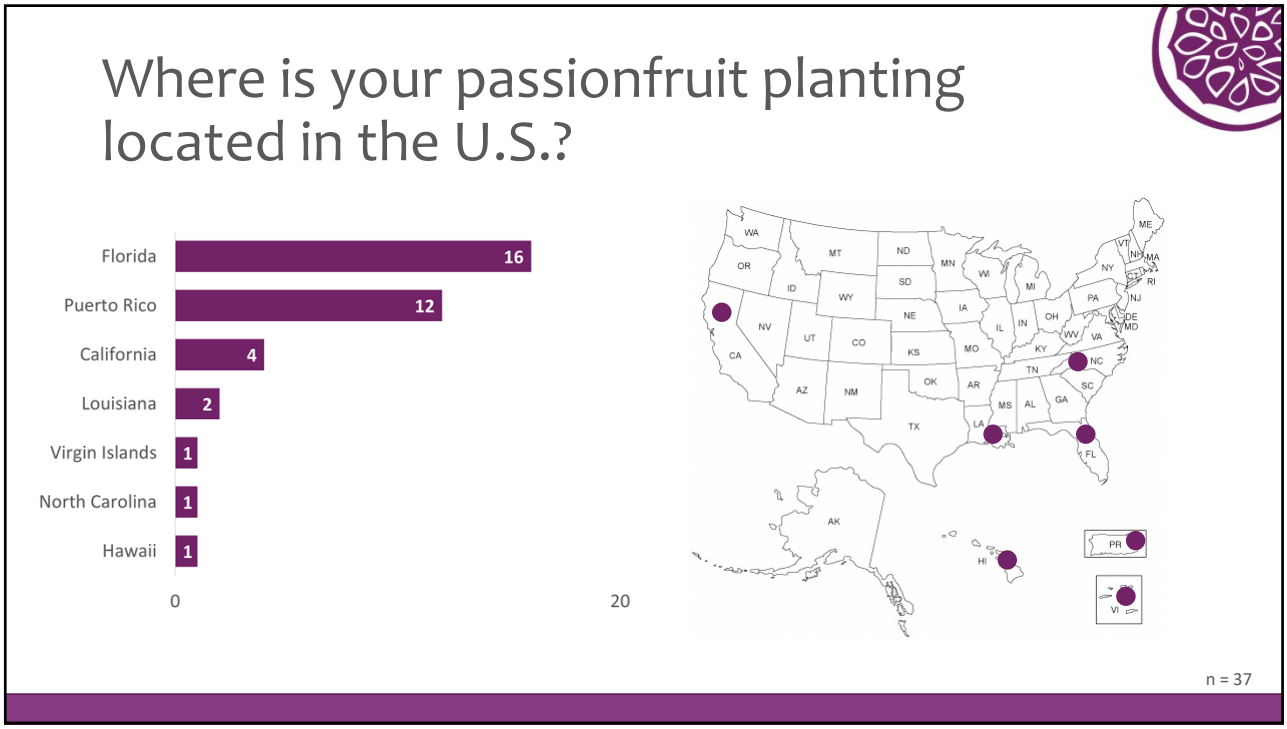
Survey Procedures

- The first attempt to assess the passionfruit industry in the U.S., and results are being used to inform decisions about future endeavors.
- Survey launched in February 2022 via Qualtrics online survey software with English and Spanish version.
- Researchers and Extension educators distributed the survey to current or interested passionfruit producers.
- Currently, we have useable responses from 37 producers.
- The survey remains open and can be accessed via Qualtrics.

2


54
Average Age
(26-87)
74%
26%
College degree (16 years)
16
Advance or professional degree (more than 16 years)
10
High school graduate, GED, or equivalent (12 years)
4
Other (please specify)
3
Vocational (13-14 years)
2
0
6
12
18
Hispanic
Not Hispanic
0
5
10
15
20
White
24
Multiple
6
Other
3
American Indian or Alaska Native
1
Asian
1
0
5
10
15
20
25

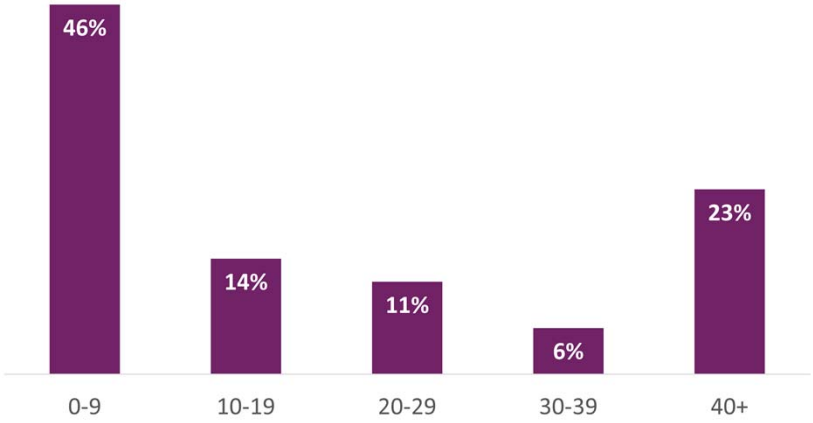
3


Where is your passionfruit planting located in the U.S.?
Florida
16
Puerto Rico
12
California
4
Louisiana
2
Virgin Islands
1
North Carolina
1
Hawaii
1
0
20
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
MD
DE
NJ
CT
RI
MA
VT
NH
ME
AK
HI
PR
VI
n = 37

4

How big (acres) is your farm in total?

Most passionfruit producers have farms **less than 10 acres**.

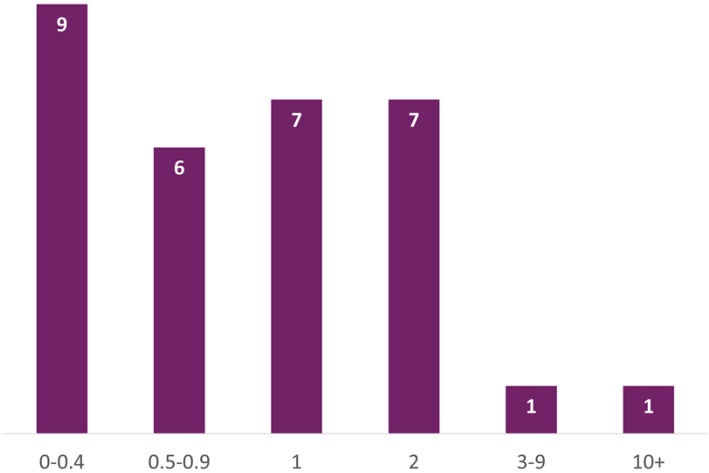


n = 35

5

How many acres are planted with passionfruit?

Most passionfruit producers farm **less than 3 acres** of passionfruit.

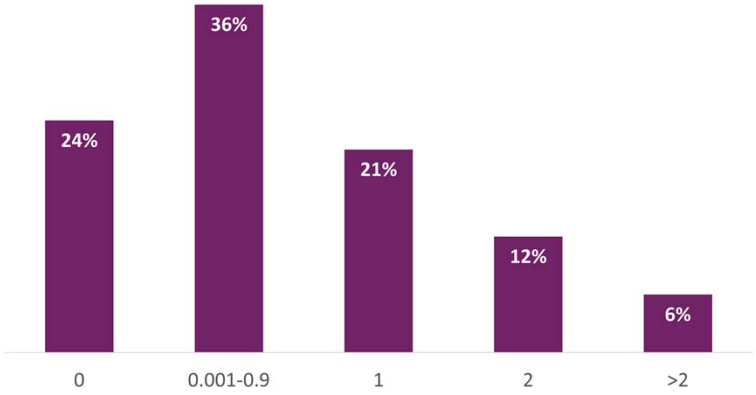


n = 31

6

How many acres had fruit-bearing passionfruit in 2021?

Most producers had **less than 2 acres** of fruit-bearing passionfruit.



n = 33

7

How many acres did you dedicate to passionfruit in 2019 and 2020?

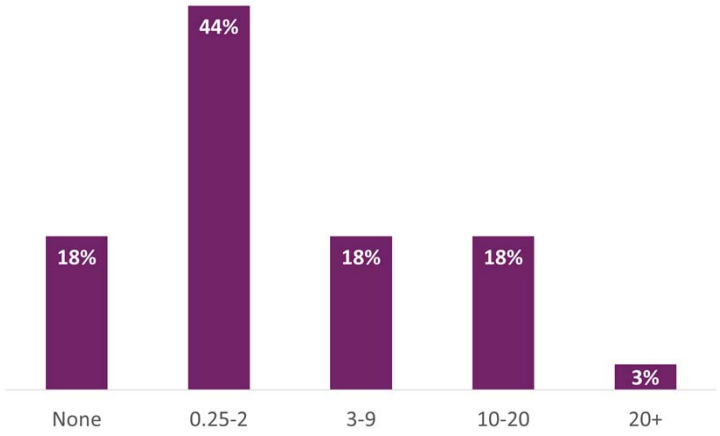
Average Acres 2019	Average Acres 2020	Percent Growth
1.21	1.38	38%

n = 32, 33

8

How many acres of land is available for expansion in passionfruit?

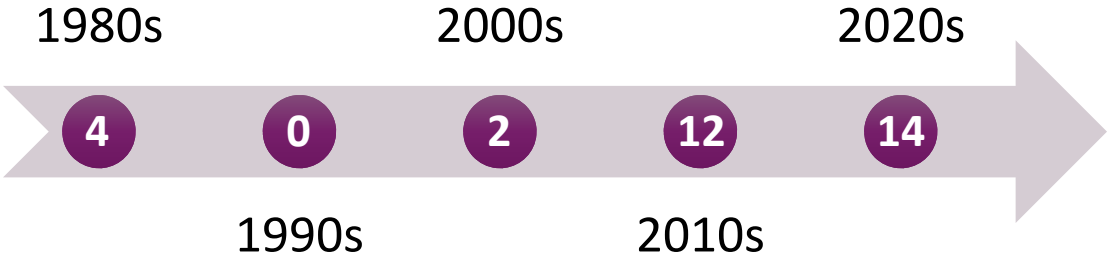
Nearly **20%** of passionfruit producers have **no land for expansion**.



n = 34

9

What year did you plant your first commercial passionfruit vines?

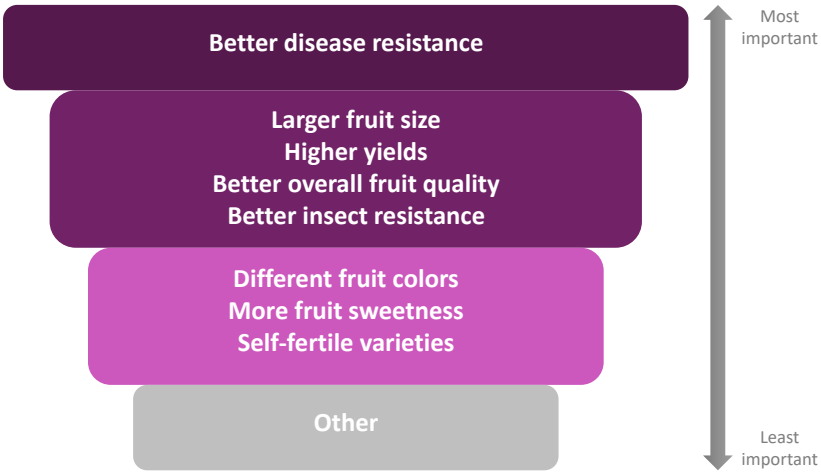


Three producers reported passionfruit growing wild. One respondent is not a commercial producer.

n = 36

10

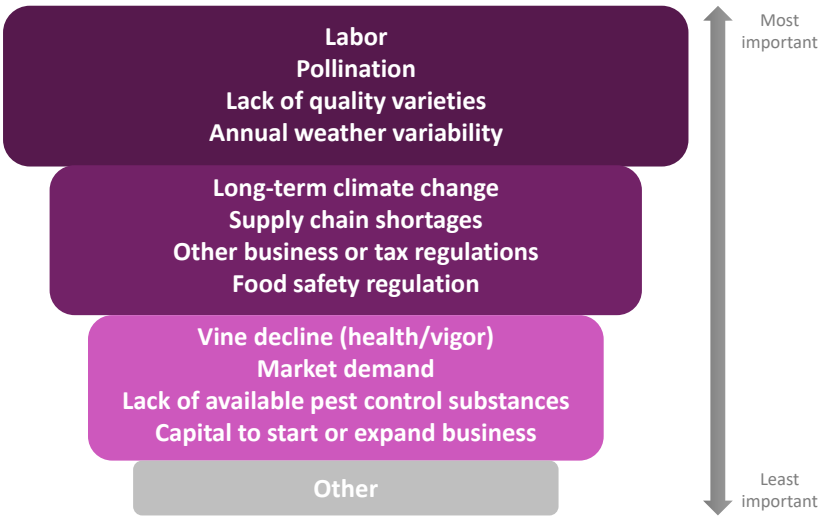
What are the biggest needs for new varieties?



n = 35

11

What are the top obstacles to obtaining optimum production?



n = 34

12

What was the passionfruit yield from your farm in 2021?

7,043

pounds per acre

n = 12

13

What was the average price received per box flat in 2021?

$40.8

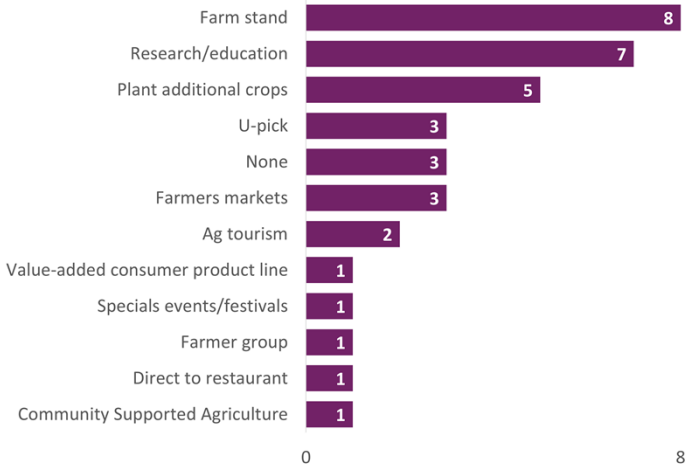
Dollars per box flat

n = 5

14

What additional agricultural activities do you or your family participate in?

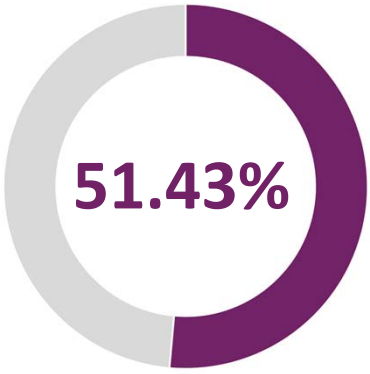
Respondents participate in a **wide range** of other ag activities.



n = 22

15

Do you produce value-added products from passionfruit (i.e., jellies, juice, pulp, etc.)?



Just over half of passionfruit producers produce value-added products.

n = 35

16

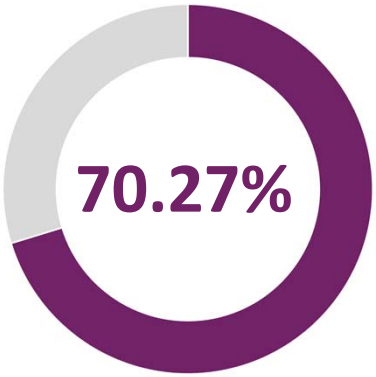
What new markets are you considering entering?

New Markets Considered
OCATI®
Farm to home
Farm stand
Loquats
Ice cream
Farmers market
Facebook marketplace
Sell passion fruit jelly, jams, pulp, fruit, juice, and baked goods
Wholesale
Online sales

n = 21

17

What is your outlook for the future of the passionfruit industry in the U.S.?



The majority of passionfruit producers have a **positive outlook** on the passionfruit industry. Some are neutral, and none have a negative outlook.

n = 37

18

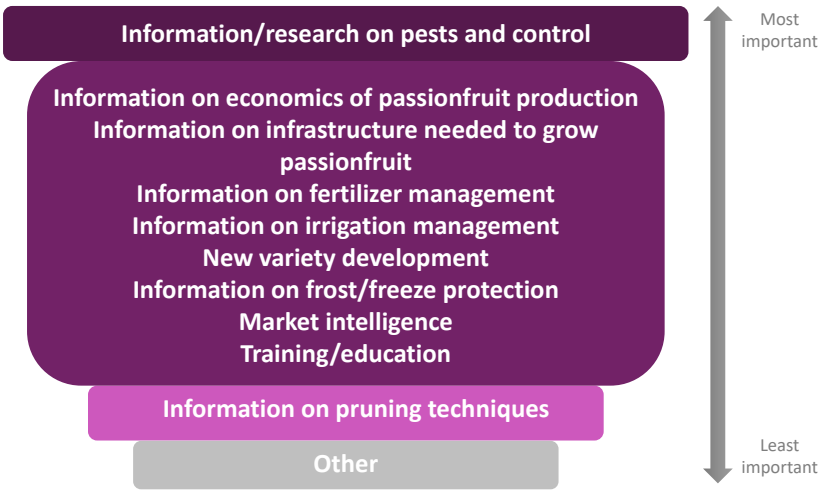
Please specify why you have a positive outlook for the future of the passionfruit industry in the U.S.

Positive Outlook Reasons
Market demand
Integral to tourism
Increased public awareness around nutrition
Increased consumer knowledge of alternate fruit crops
Low labor, low water requirements
High value crop that is profitable for small acreages

n = 23

19

What support do you need from university Extension and Research in relation to passionfruit production?

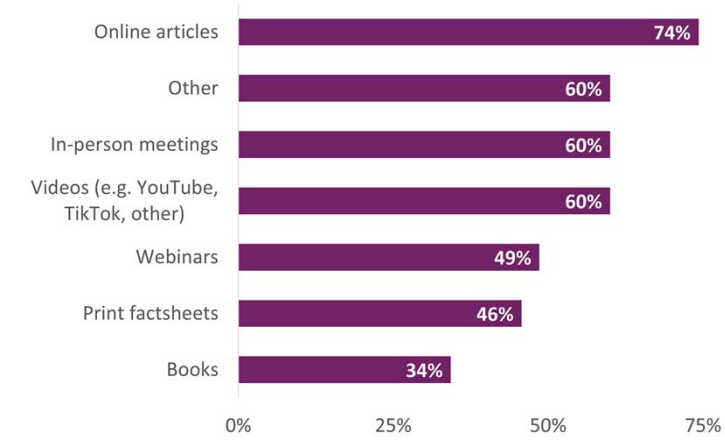


n = 36

20

How would you prefer to receive information regarding passionfruit production?

Nearly **75% of passionfruit producers** want to receive information through **online articles**.

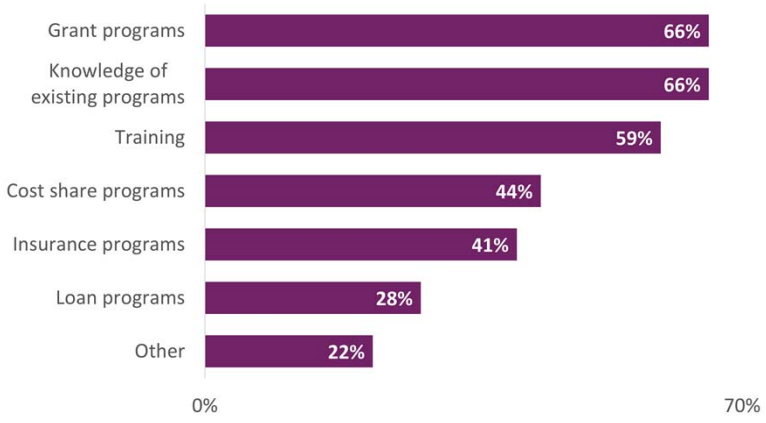


n = 35

21

What actions can the local, state, or federal government take to better support you in passionfruit production?

Grants, more information, and training could support production.



n = 32

22

What actions can the brokers of passionfruit take to better support you?

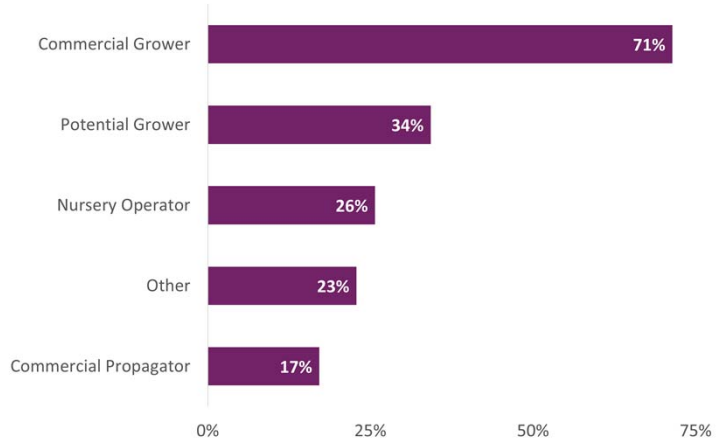
Actions to be Taken
Stable/better pricing
Seek me out
Finance growers
Passion fruit education
Provide financial and marketing information for small scale farmers
Prompt turnaround from harvest to sales
Be fair
More involvement with growing operations; partnership
No middlemen
More security in purchasing
Help securing permits
New technology

n = 35

23

What is your interest in passionfruit?

Most passionfruit producers are **commercial growers**.



n = 35

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Notes
Day 1 (6-14-2022)
Industry perspectives: presentations by marketing and shipping representatives addressing challenges and opportunities for the wholesale fresh-market and processing industries

Johnny Hoblick – AgriStarts (10 minutes)

- AgriStarts uses tissue culture as a way to start with disease-free plant material
- The company is a wholesaler that has some starter plants for passionfruit production
- *P. edulis* 'Possum Purple' is the primary cultivar they are carrying now, but they are open to more as research dictates their appropriateness for certain growing regions, especially for Florida (where AgriStarts is located)
- They are being asked by growers for types/cultivars resistant to nematodes

Rane Roatta – Miami Fruit (10 minutes)

- Miami Fruit is a small company that sells fruit, plants, seeds, and other goods online. He sources product from local growers and ships the fruit to consumers
- They have a strong presence on social media and spend a lot of time with customers on those platforms
- He stressed the importance to communicate with consumers and how to educate them on the products they are purchasing. He also lamented the widespread use of fake websites that may trick consumers.

Passiflora and its Relationship to Hawaii

Lilikoi

Ken Love 6-2022

1

UH Publications

2


HAWAII AGRICULTURAL EXPERIMENT STATION
HONOLULU, HAWAII
BULLETIN No. 74
THE EDIBLE PASSION FRUIT IN HAWAII
By
W. T. POPE, Senior Horticulturist
Issued September 1935
UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF EXPERIMENT STATIONS
1935
PRIZE-WINNING
PASSION FRUIT
RECIPES
1955
Cooperative Extension Service
University of Hawaii
Circular 345
PASSION FRUIT CULTURE
IN HAWAII
1972 (Revised)
TECHNICAL BULLETIN No. 39
MARCH 1959
POLLINATION AND FRUIT SET IN THE
YELLOW PASSION FRUIT
Ernest K. Akamine
and
Guido Girolami
HAWAII AGRICULTURAL EXPERIMENT STATION, UNIVERSITY OF HAWAII
1959
THE VOLATILE CONSTITUENTS OF PASSION
FRUIT JUICE (Passiflora edulis
f. flavicarpa, DEGENER)
A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
JUNE 1969
College of Tropical Agriculture and Human Resources
University of Hawai'i at Mānoa
Fruits, Nuts, and Beverage Crops
September 2014
F_N-44
Passion Fruit:
Postharvest Quality-Maintenance Guidelines
Robert E. Paull and Chang Cheng Chen
Department of Tropical Plant and Soil Sciences
Passion fruit
2014

3

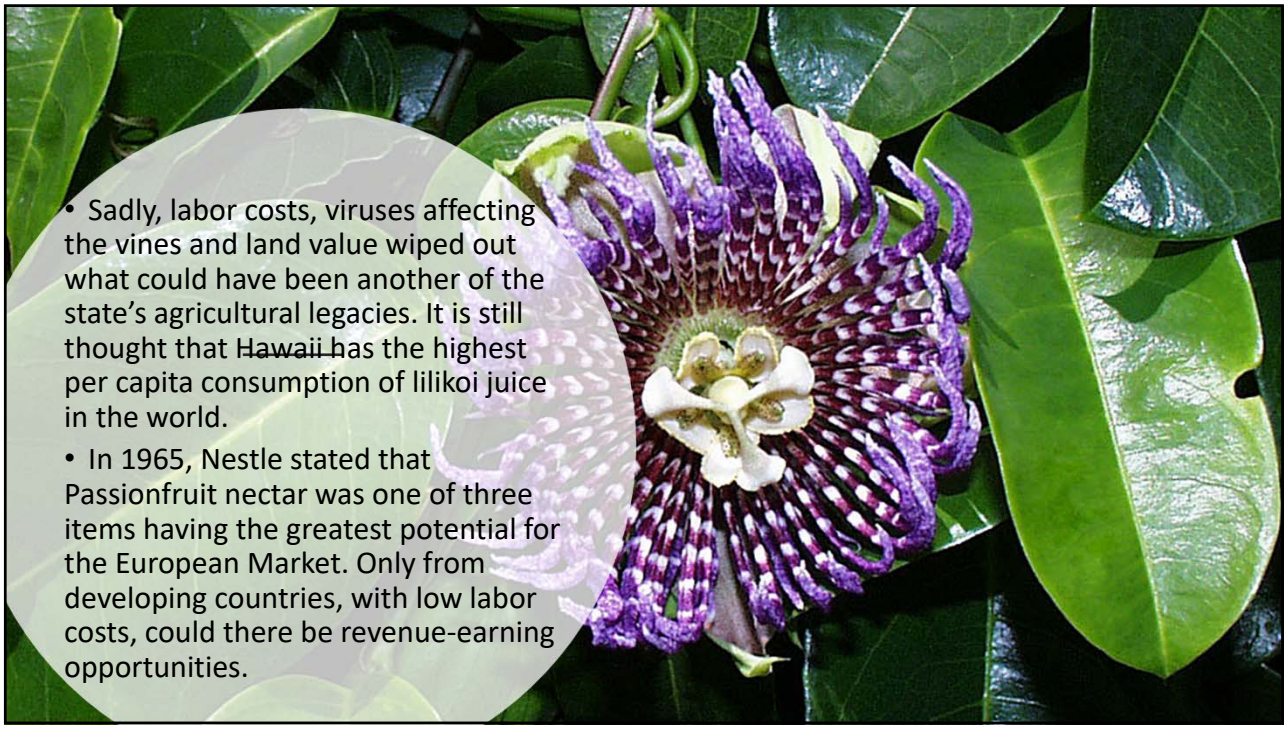

History

4

- The first purple lilikoi came in the 1880s from Australia other Yellow cultivars in 1923 from Australia and Brazil

- Lilikoi is a Hawaiian name for baby girls.
- The first commercial orchards were planted in Hawaii in the 1930s when five acres enabled a small Kauai processor to produce jarred concentrate.
- These selected "flavacarpa" fruits have four times the yield of the purple passionfruit. By 1958 there were more than 1200 planted acres in the state in order to produce frozen concentrate for Minute Made.

5



- Sadly, labor costs, viruses affecting the vines and land value wiped out what could have been another of the state's agricultural legacies. It is still thought that Hawaii has the highest per capita consumption of lilikoi juice in the world.
- In 1965, Nestle stated that Passionfruit nectar was one of three items having the greatest potential for the European Market. Only from developing countries, with low labor costs, could there be revenue-earning opportunities.

6

Cultivars from the 60s

Australian Purple', 'Common Purple', 'Kapoho Selection', 'Pratt Hybrid', 'Sevcik Selection', 'University Round Selection', 'University Selection No. B-74','Waimanalo Selection', 'Yee Selection' and what was considered the best in the late 60's, **'Noel's Special'** with 88% usable pulp. -- All are unknown today

*Banana Passionfruit (*Passiflora mollissima* Bailey) aka poka
*Water Lemon (*Passiflora laurifolia* L.) aka lemiwai
*Giant Granadilla (*Passiflora quadrangularis* L.) 1881
Sweet Granadilla (*Passiflora ligularis* Juss.)

* On someones' invasive list!

7

Hawaii TROPICAL FRUIT GROWERS

•1800 members with more than 1200 having between 1 and 200 vines who…

•Need help with pollination problems

•No established aggregation or coop

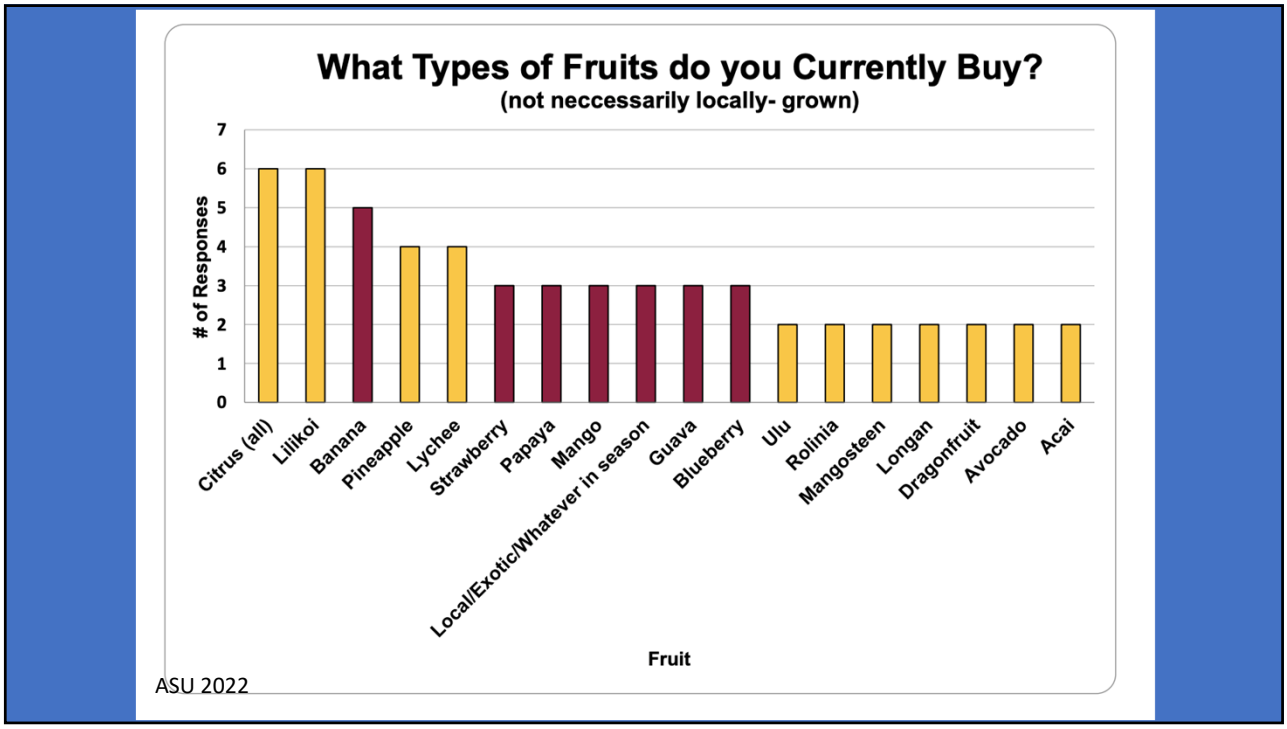
•Lack of cost of production knowledge

*Need to learn new trellising systems like Australian tatura, Israeli methods, Lebanon, Uganda, Italy etc. etc.

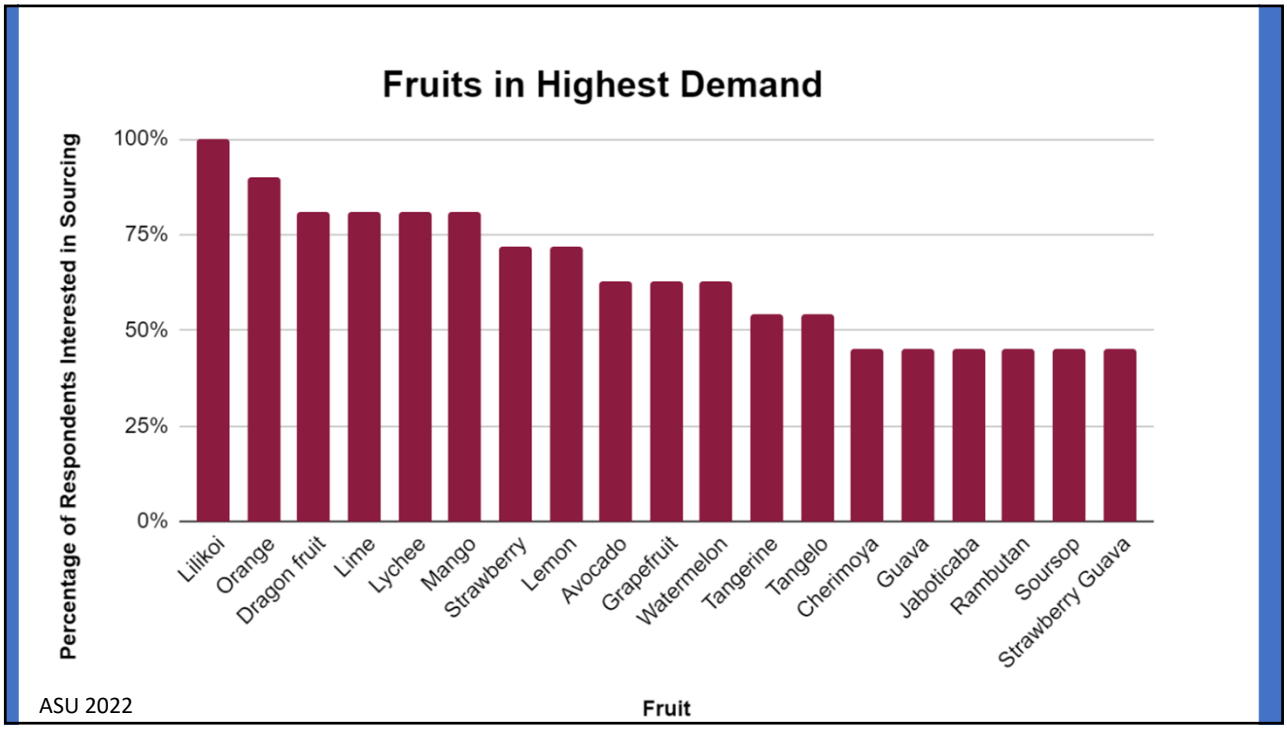
8

Statistics

9



10

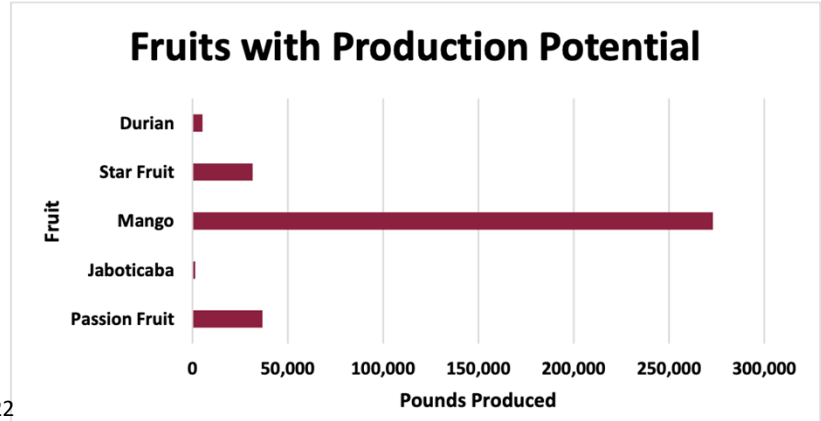


ASU 2022

11

Passion Fruit, Jaboticaba, Mango, Star Fruit, Durian

Passion fruit (36,700 pounds produced in 2018), jaboticaba (1,460 pounds produced in 2018), mango (273,000 pounds produced in 2018), star fruit (31,500 pounds produced in 2018), and durian (5,260 pounds produced in 2018) have potential for creating value-added products as well (Love). However, likely the production levels of these crops would need to be increased. The production levels of these crops in 2018 is pictured in Figure 10 below.



ASU 2022

12

Table 9: Top Ten Fruits in Production (Source: Fruit Growers Survey)

Fruit	Number of Farms Producing
1) Banana	61
2) Avocado	58
3) Orange	40
4) Lemon	47
5) Passionfruit	45
6) Papaya	42
7) Lime	42
8) Mango	40
9) Cacao	38
10) Tangerine	37

ASU 2022

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Table 5: Paddle Finisher Throughput Estimates (Brown, 2021)

	Avocado		Papaya		Lilikoi*	
	Min	Max	Min	Max	Min	Max
Lbs / hour	2,000	4,000	1,000	2,000	6500	11,000
Lbs / 5-day wk	240,000	480,000	120,000	240,000	780,000	1.32 mil
Lbs / 50-wk year	12 mil	24 mil	6 mil	12 mil	39 mil	6.6 bil

*Lilikoi = Passion fruit

ASU-2022

14

15

Value Added

16


Hawaiian
Lilikoi
Apple
Goodness
Maui Upcountry
LILIKOI JELLY
NET WT. 7.5 OZ. (212.6g)
Hawaiian Sun
LILIKOI PASSION
Lilikoi Butter
NET WT. 10 OZ (283.5G)
Made from Kona grown lilikoi passionfruit, pectin and sugar.
Margy's Lilikoi Jam
Refrigerate after opening.
May contain some seeds.

17


Lilikoi Jelly
edible
HAWAIIAN
ISLANDS
LILIKOI JELLY
TASTING RESULTS
Maui
Tutu's Pantry
tart on the finish • well-balanced
fruit forward
Maui Upcountry
honey flavor • citrus finish
sweet
O'ahu
Kukui Farms
fresh flavor • bright notes
concentrated flavor
Old Hawaii Recipe
very tart • liquid-like
sour notes
Kaua'i
Kukui Lilikoi
light lilikoi flavor • soft mouth feel
perfect sweetness
Aunty Lilikoi
decadent • perfect balance
amazing lilikoi flavor
Hawai'i
Jammin' Jelly
strong lilikoi flavor • low acid
pineapple notes
Island Valley Delights
orange flavor • soft consistency
perfumed smell
Graphic Design by Silver Moon Art & Design • SilverMoonMaui.com

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Growers' perspectives: presentations about the biggest challenges and opportunities of the horizon

Ken Love -- Hawaiian Tropical Fruit Growers "Liliko'i (passion fruit) production in Hawai'i" (10-15 minutes)

- Many of the cultivar identification has been lost and they don't know what anything is anymore for certain
- In Hawaii, it is not allowed to import/export between islands
- Much of the passion fruit produced in Hawaii goes into value-added products such as jam/jelly, etc.
- HI is the biggest consumer of passion fruit in the US
- Passion fruit is the most wanted fruit in HI after Durian

Passionfruit Field Trip Stop #1

Farm of Osvany Rodriguez

Passionfruit Field Trip Stop #2

Farm of Jackie Chen

Notes
Day 2 (6-15-2022)
Notes on Breakout groups:

Breeding/Genetics – Josh Anderson/Manjul Dutt

- Breeding is 1st step in quality control
- Several established breeding programs – Brazil (largest consumer and producer), Colombia, Ecuador, South Africa, Asia
- Very diverse locations (HI, CA, FL, PR, MS) – SARE – multistate grants
- Gene bank/ germplasm repository/ common nursery for storage and dispersal of cultivars and germplasm
- On-farm/ on-station testing needed to improve available cultivars
- International collaboration would be a natural next step in obtaining germplasm
- Traits of interest: cold hardiness (from *P. incarnata*, other species), heat tolerance, self-pollination, improved yield, flavor, nutrition, fragrance/aroma, disease/insect tolerance/resistance, post-harvest traits
- High chemical inputs are the current way passionfruit is grown (passion fruit production in south America is addicted to chemicals)
- FL, PR good test areas for disease/insect screening
- Consortium of breeders – multistate opportunities if funding can be obtained
- Weaknesses: Lack of available genetic resources, genetic markers (single nucleotide polymorphisms -- SNPs)
- Strengths: advances in genomics, cost of sequencing (genome wide association study -- GWAS), potential biological control of pests
- Opportunities: interspecific crosses, controlled environments (hoop house, screen house, high tunnel, greenhouse), shorter ripening period, fresh market in U.S., local consumers, farmers market, post-harvest – value added products

Pest/Disease – Romina Gazis/Daniel Carrillo/Dara Stockton

- Viruses (potyvirus) are primary disease issue, aphid and human transmission (propagation, pruning) are how they are spread
- Virus infection leads to reduced yields and pulp content – then eventual decline, death
- Can we learn to live with viruses? Critical to start with clean plant material
- Fungal diseases are manageable (for now)
- Feeding insects are relatively easy to control – small complex of insects cause most problems
- Bigger problem - aphids and virus transmitting insects – very difficult to control
- Mite transmitted virus has been found in HI and Brazil
- Potential invasive pests include weevils
- Develop better management programs to get away from chemical inputs ($)
- IPM programs – keep vines healthy longer, tools based on season/phenology, monitoring
- Cultural practices – use of trap plants, sterilize pruners, start with disease free material
- Spray coverage important – how big does canopy need to be? How long can vines continue to live and produce when infected? How important is variety vigor in plant longevity?
- Can windbreaks help reduce insect and disease incidence? (e.g. the movement of aphids that vector viruses)
- Can planting rotation help reduce insect and disease incidence?
- Organic spray rotation may be viable option in some areas
- Predators and parasitoids for augmentative control needs to be researched
- Butterfly species (Gulf fritillary) - protected culture (high tunnels, netting) may limit their impact, Bt (*Bacillus thuringiensis*) can control them
- Protective mulches may provide benefits, especially for weed pests (and indirectly for insects)
- Kaolin clay and deterrent products should be researched
- Vine tolerance to butterfly has been observed. Research could lead to breeding for tolerance in new varieties
- Monitoring programs should be optimized for best management practices
- Early control is essential for best plant health – sanitation, reduce pressures, phenology
- Much of passionfruit production is labor intensive, how to reduce?
- Weed species can act as trap crops for insects
- Yellow sticky traps to monitor aphids, thrips – implement based on seasonality
- Can pruning reduce pests? Sanitation, airflow, sunlight penetration through canopy may be beneficial but optimal amount is unknown
- Root rots (phytopthora) – some resistance to this disease is in *flavicarpa*?

Horticulture Production – Jonathan Crane/ Jeff Wasilewski

- Infrastructure research is an important part of new knowledge in growing passionfruit – best plant x row spacing, trellis height/type, amount of canopy light penetration, wind movement, shading, irrigation system (drip vs. overhead), pest control, raised bed/mound height, etc.
- Soil structure/depth, rooting depth knowledge can allow for better vine growth. Vines are shallow-rooted plants.
- Fertilizer management (granular vs fertigation). Not much is known in this area. Different benefits for each system.
- Trellis height and configuration are different among regions growing passionfruit.
- Ground cover vs clean culture vs mulch may depend on specific site requirements
- Pruning – keep vines open to airflow and regularly sterilize tools to prevent virus spread
- Propagation is easy from cuttings, but they may be virus infected so test mother plant (isolate mother plants). Use of rooting hormone may or may not be beneficial as it depends on species. Potential of pot production should be explored.
- Growers can test for infection with diagnostic test strips once they are trained, but the strips are sometimes not as sensitive to asymptomatic vines. The best way to get a more definitive answer is have a lab do the PCR tests
- How is cold protection done? The best way is overhead irrigation, but this can be expensive. Need ¼" per acre per hour start at 36°F (monitored at 2-3ft), well distributed. Trunk wraps may provide some protection is certain situations
- Low vs high volume micro-sprinklers have different uses. Mostly these types do not provide complete cold protection.
- Irrigation how much and how often? Short but frequent irrigation is necessary for passionfruit vines, amount varies across locations
- Heat tolerance not known well among cultivars
- Economics of protected culture needs to be worked out before recommendation of this system
- Opportunity for research is comparison of impact sprinklers, wobblers, rotary sprinklers in providing irrigation and cold protection
- Every year is different with weather and growing season length. Being able to adapt is important

Marketing – Trent Blare/Fredy Ballen

- Costs of production, investment, startup, land, infrastructure are included in enterprise budgets
- Consumer preferences/markets is a strong area for research to expand product beyond current consumers
- Regulation/value chain need to be better understood to improve market
- Enterprise budget development is happening and will be available soon (for south FL only at this point, thus location specific)
- Crop insurance – can insure up to 85% of revenue, risk management agency – petition to include passion fruit would need to be done
- Land cost is high in some areas and can be limiting factor, land value $100,000 per acre value in some areas
- Agricultural exemption (min. 5 acre) in FL is taxed differently from land with house
- Extension outreach lacking in some areas due to limited funding and available personnel
- Difficult to compare locations, lack of local expertise in all regions/states thus new effort requires collaboration across states
- Compare budgets of small, medium, and large farms – currently just have average of commercial
- Cash flow analysis is next step in research from enterprise budget
- Consumer demand research - willingness to pay by type/variety is an area that could be done relatively soon
- Direct marketing is a valuable opportunity for growers
- Value-added product opportunities include wholesale and retail sales
- Niche local vs import. How to balance domestic crops with imports/exports? Imported processed products are cheap compared to what can be produced here
- Sustainable reduction of carbon footprint should be a concern and an area of research
- Getting organized, coordination extremely important to push forward any marketing strategy. Other fruit crops have done this effectively (citrus, blueberries, mango, etc.)
- Passion fruit board? Can this be created? Enough interest?
- Supply chain bottlenecks are difficult right now
- Regional specificity of markets makes generalizations difficult
- Lack of local expertise in many areas requires collaboration across states
- Farm mechanization could help reduce labor inputs, but most labor is done by hand right now
- Segmentation of markets – high end vs typical markets. We need to study these opportunities to see viability of these markets.
- Food safety requirements – FSMA, GHP/GAP, PRIMUS are key elements for any food producing business. Farm needs a food safety plan. Training is available through universities.
- Marketing using food safety certifications is an advantage for US.
- Consistency in supply always helps a crop become accepted by consumer, they will try new things if they are regularly introduced to it.

Extension/Education – Eric Stafne/Mark Bailey

- Very few educational products, such as production guides, are available for growers
- Educational programs, webinars are how to deliver knowledge right now
- Can we translate research across fields/regions? Lack of research has been done therefore we have large knowledge gaps for passionfruit production
- We may need to break down passionfruit production by regions/climate to generate and optimize information
- A website for pubs/impacts/grants details could be a central place to find info. This should be included in grant proposals going forward
- Use resources from other countries that have more developed educational products – partnerships, collaborations, among researchers/growers, develop group (informal) to meet up regularly
- University of Florida Extension publication (EDIS) is currently offered to growers. It includes information on planting establishment, management, horticulture
- Farmer to farmer experiences would be valuable for new growers
- Social media/passionfruit groups/Facebook are options that can be initiated
- National board? Is there enough interest to create such a thing?
- Repositories for science-based information and discussion groups, could be done via website and social media platforms. Science/ peer reviewed pubs, videos/ extension, resources would be available on the website and updated regularly (but needs a paid, point person to do the work)
- Advantages of hybrid meetings is that people from all of the world can attend and participate. Also, cost is reduced.
- Information on shipping and handling is available to some extent as there are some guidelines from USDA
- IFAS (Dr. Steve Sargent) has done some research in packaging and storage of passionfruit

Ripening of Passionfruit Under Normal and Extreme High-Temperature Conditions

Sonya Leonore Stahl and Steven A. Sargent
University of Florida/IFAS Postharvest Horticulture Laboratory
Gainesville FL

1

Passionfruit

Tests were conducted to simulate ripening under low and high humidity conditions:

1. an air-conditioned, kitchen countertop (20°C; 50% RH vs. 90% RH)
2. humid tropical and dry tropical conditions

2

Passionfruit

Ripening-associated peel shriveling during storage at 70 °F/50% RH

- Prevented entirely at 70 °F, 90% RH (right side)

3

Passionfruit

Ripening-associated shriveling as affected by temp and RH

Environment	Temperature (C°), RH (%)	Days to Ripe	Unshriveled – High RH (%)	Shriveled – Low RH (%)
Air conditioned	21°C, 90%	6	100	0
Tropical/high RH	30°C, 80%	5	72	20
Tropical/high RH	30°C, 80%	6	85	33
Tropical/low RH	35°C, 50%	3	75 (very minor shrivel)	0
Tropical/low RH	35°C, 50%	4	75 (very minor shrivel)	0

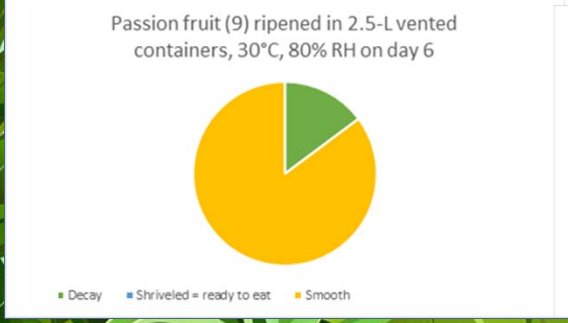
Key: 21C = 70F; 30C = 86F; 35C = 95F

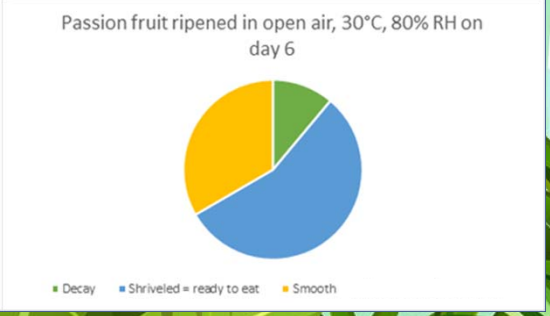
4

Passionfruit

Ripening-associated shriveling:

- More prevalent at high temp, but still suppressed by high RH
- High ambient RH suppressed collapse in open-air fruit





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Passionfruit

Minor decay present at high temperatures

- 11-15% of fruit at 30°C/80% RH, regardless of treatment

35°C/50% RH, stem-only mycelia after 4 days

30°C/80% RH, 6 days

6

Goals for Each Focus Area:

Breeding/Genetics

- **Short term goal** (1 year):
  - Summarize information on genetic availability (catalog of germplasm),
  - Determine cost of establishing germplasm collection and deciding location(s),
  - Research on how to preserve germplasm long term
- **Medium term** (3-5 years):
  - Germplasm screening and variety testing. Begin with one location trial to generate trait data for crop modeling
  - Seed preservation for conservation purposes (native spp.)
- **Long term** (5+ years):
  - Multi-location trial,
  - Establishment of breeding program
  - Genomics (markers, tools for selection of varieties/traits)

Pests/Diseases

- **Short term** (1 year):
  - Create an insect and disease identification guide
  - Do more clean plant education, including tissue culture information (AgriStarts can help)
  - Publication on tips to prevent disease/insects
  - National Clean Plant Network (NCPN) grant program
- **Medium term** (3-5 years):
  - Determine pathways of viral transmission,
  - Modelling for potential new or invasive pests
  - Identification of different viruses,
  - Economic analyses for disease (loss), export risk, post-harvest/phytosanitary (with USDA)
- **Long term** (5+ years):
  - Availability of new labels and chemistries (IR-4)
  - Horticultural practices to mitigate biological issues
  - IPM approach framework
  - Tissue culture research and cryo-preservation

Horticulture Production

- **Short term** (1 year):
  - Compile information on infrastructure based on region/area/sites,
  - Initiate website where all information is stored with links to include irrigation, fertilization, nutrient contents, quality standards from other regions (Dr. Manjul Dutt's finger lime site could be used as a template)
- **Medium term** (3-5 years):
  - Research on canopy management, plant spacing, shade impacts, equipment needs, yield improvement, and pest/disease control
  - Identify weed hosts for pest/disease as well as for pollination improvement
- **Long term** (5+ years):

    - Create guides for best management practices (BMP), including integrated pest management practices (IPM), for each region

Marketing/Economics

- **Short term** (1 year):
    - Enterprise budget assessment (investment, revenue) of passionfruit production translate/implement to other states, including investment costs
- **Medium term** (3-5 years):
    - Complete budget analysis of start-up costs
    - Determine who is target audience/consumer for passionfruit in the U.S. Learn the differentiation of consumers and supply chains
- **Long term** (5+ years):
    - Marketing analysis in multiple locations and future trends

Extension/Education

- **Short term** (1 year):
    - Gather contact list of growers (email, phone)
    - Create a field guide of biotic and abiotic problems associated with passionfruit production
    - Gather list of passionfruit specialists from abroad and compile on website
- **Medium term** (3-5 years):
    - Develop communication venues, including blogs, podcasts, social media, newsletter, YouTube. Each state could upload content, updates, videos
- **Long term** (5+ years):
    - Publish comprehensive manual for production,
    - Gauge interest for a national grower organization that would include others (researchers, consumers)

USDA United States Department of Agriculture

Passion Fruit Import Summary
Passiflora edulis

Bob Balaam
National Operations Manager
USDA APHIS PPQ

June 2022

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USDA United States Department of Agriculture

Basic Requirements

- Import permit required *(fruit and some propagative material)*
- Subject to inspection at port of entry

- *Check specific requirements at Agricultural Commodity Import Requirements (ACIR) website https://acir.aphis.usda.gov/s/*
- *Apply for APHIS Import Permit at APHIS eFile website https://efile.aphis.usda.gov/s/*

2

USDA United States Department of Agriculture

Authorized Countries
Fresh Fruit

- Australia –
  - From Tasmania only
  - Into all ports except Hawaii
- Bermuda – Into all ports
- Chile –
  - Commercial consignments only
  - From area free of Mediterranean fruit fly
  - Precleared shipments only (PPQ Form 203 or vessel report required)
  - Phytosanitary certificate required
  - Into all ports

3

USDA United States Department of Agriculture

Authorized Countries
Fresh Fruit

- Micronesia – Into Guam and CNMI only
- Palau – Into Guam and CNMI only
- New Zealand -
  - Into all ports except Hawaii
  - No distribution to Hawaii
- St. Vincent and the Grenadines –
  - Into all ports*
  - *Imports suspended effective April 2011 due to introduction and establishment of Anastrepha obliqua (West Indian fruit fly) in SVG

4

USDA United States Department of Agriculture

Inadmissible Countries
Fresh Fruit

- Import permits will not be issued at this time.
- NPPO of exporting country must make a formal request.
- APHIS must scientifically review the phytosanitary impact of the request.
- APHIS must solicit public comment.

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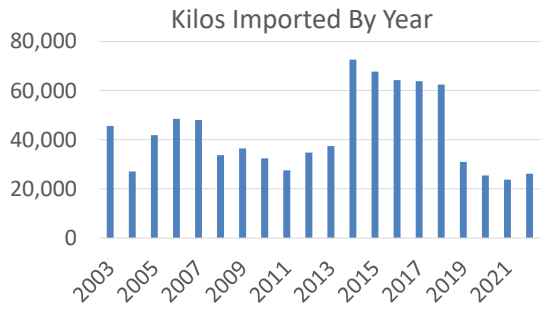
USDA United States Department of Agriculture

Quantity of Imports By Year – Fresh Fruit

Calendar Year	Kilograms
2003	45,529
2004	27,079
2005	41,858
2006	48,464
2007	48,010
2008	33,709
2009	36,458
2010	32,397
2011	27,525
2012	34,732
2013	37,412
2014	72,587
2015	67,713
2016	64,220
2017	63,819
2018	62,454
2019	30,978
2020	25,412
2021	23,724
2022	26,154
Grand Total	**850,234**
Average/Year	**42,512**



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USDA United States Department of Agriculture

Quantity of Imports by Origin – Fresh Fruit

Origin	# Shipments	Kilograms	% of Total
New Zealand	1,719	850,130	99.99%
St. Vincent and the Grenadines*	9	104	0.01%
Grand Total	**1,728**	**850,234**	**100.00%**

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USDA United States Department of Agriculture

Quantity of Imports By Port of Entry – Fresh Fruit

Port of Entry	Kilograms
CA Los Angeles CBP	838,968
TX Houston Air CBP	7,967
NY JFK CBP	2,344
CA San Francisco CBP	420
NY JFK Air Cargo CBP	288
IL Chicago CBP	144
FL Miami Air Cargo CBP	104
Grand Total	**850,234**

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USDA United States Department of Agriculture

Authorized Imports - Propagation

- Plants
  - From Canada
    - Into all ports
    - No import permit required
    - Phytosanitary certificate required
    - Inspected by CBP at border
  - Post Entry Quarantine Requirements – 2 year grow-out in quarantine
    - Import permit and phytosanitary certificate required
    - Into ports with USDA plant inspection stations (16)
    - From Potato Cyst Nematode (PCN) countries; grown for 12 months in PCN free soil or in a soil-free substrate
    - From Non-PCN countries
    - From Israel; produced by facility in Israeli approved *Spodoptera littoralis* exclusion program

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USDA United States Department of Agriculture

Authorized Imports - Propagation

- Seed
  - All origins
    - Import permit required *(except Canadian origin)*
    - Must enter through a USDA plant inspection station *(except Canadian origin)*
    - Phytosanitary certificate required
    - Specific packaging requirements (see ACIR)
    - GREEN and YELLOW import permit label (PPQ Form 508) required for mail, express courier, personal baggage imports
    - Must be free of pulp as well as sand, soil, earth, and other growing media.
    - Small lots of seed
      - Maximum of 50 seeds of 1 taxon per packet, OR
      - Maximum weight not to exceed 10 grams of seed of 1 taxon per packet, OR
      - Maximum of 50 seed packets per shipment.
      - Free from pesticides
      - Packed in secure packets or envelopes and sealed to prevent spillage
  - From Canada
    - No import permit required
    - Into all ports

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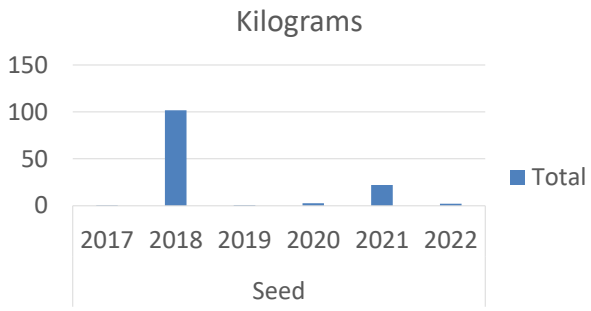
USDA United States Department of Agriculture

Quantity of Imports by Year – Propagative Material

PM Type / Year	Kilograms
Seed	**129.49**
2017	0.4652
2018	101.755
2019	0.506
2020	2.5312
2021	22.1226
2022	2.11
Grand Total	**129.49**



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USDA United States Department of Agriculture

Quantity of Imports by Origin – Propagative Material

PM Type / Origin	Kilograms	# Shipments
Seed	**129.49**	**32**
China	111.66	12
Australia	14.0526	3
Italy	2.27	1
Germany	1.2932	6
Portugal	0.11	2
India	0.072	2
Japan	0.015	1
United Kingdom of Great Britain and N. Ireland	0.01	1
Indonesia	0.0052	2
Peru	0.002	2
Grand Total	**129.49**	**32**

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Comments?

Questions?

Bob Balaam
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US Department of Agriculture
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Presentations on current research and extension efforts related to passion fruit:

Passion Fruit Import Summary, B. Balaam, National Operations Manager – Exclusion & Imports, USDA APHIS PPQ Field Operations (10 minutes)

- Import permit required
- Subject to inspection at one of 16 inspections stations for USDA APHIS, ACIR
- Check ACIR website for requirements
- Apply for APHIS import permit
- Countries authorized to export – Australia (Tasmania only), Bermuda, Chile (commercial consignments only, free from Mediterranean fruit fly, Micronesia (Guam and Commonwealth of Northern Mariana Islands (CNMI) only), Palua (Guam and CNMI only), New Zealand (into all ports but HI, no distribution to HI), St. Vincent and Grenadines
- Inadmissible countries – import permits not issued, National Plant Protection Organization of exporting country must make a formal request, APHIS must scientifically review phytosanitary impact, APHIS must solicit public comment
- 850,234 kg grand total imports (only *P. edulis*)
- 99.9% from New Zealand
- Majority going into LA, CA
- Imports of plants: *Passiflora ligularis* has a plant import permit active
- From Canada (all ports, no import permit required, phytosanitary certificate required, inspected by Canadian Border Patrol)
- Post-entry quarantine requirements – 2-year grow out in quarantine – import permit and phyto-certificate required, into ports with USDA plant inspection stations, from potato cyst nematode (PCN) countries, grown for 12 months in PCN-free soil or soil free substrate, from non-PCN countries, Israel – produced by facility in Israel-approved *Spodoptera littoralis* exclusion program
- Import of seed:
- All origins – permit required, USDA plant inspection station, phyto-certificate required, green and yellow import label required, must be free of pulp, sand, soil, earth
- From Canada – no import permit required, into all ports
- Propagative material – 129.49 kg total (mainly from China)

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Agricultural Marketing Service

Creating Opportunities for American Farmers & Businesses

1

Specialty Crops Market News Division

June 15, 2022

2

Agricultural Marketing Service

Market News is…

The Eyes and Ears
of American Agriculture

3

Agricultural Marketing Service

Mission

To provide timely, accurate, and unbiased information on current agricultural markets.

Motto

- Get It
- Get It Right
- Get It Out

4

Agricultural Marketing Service

Market Levels Covered

- Shipping point or f.o.b.
- Terminal/wholesale (12 domestic markets)
- Retail – advertised weekly specials
- Farmers markets and producer auctions

5

Agricultural Marketing Service

Movement Data from Market News

- Shipments, domestic
  - Truck, rail
- Crossings from Canada and Mexico
  - Trucks, air, boat
- Imports – 63 countries
  - Air, truck, boat

6

Agricultural Marketing Service

Automated Commercial Environment (ACE)

- ACE is a U.S. Customs and Border Protection (CBP) system designed to facilitate legitimate trade while enhancing border security.
- ACE will improve collection, sharing, and processing of information submitted to CBP and government agencies.
- ACE provides a single, centralized access window for the trade community to connect with CBP and its Partner Government Agencies (PGA)
- Shippers and growers provide daily movement to SCMN.

7

Agricultural Marketing Service

National FOB Review – Specialty Crops

NATIONAL FOB REVIEW

USDA United States Department of Agriculture | Agricultural Marketing Service, Specialty Crops Program, Market News Division | 230 North 1st Avenue, Suite 404, Phoenix, AZ 85003, Phone: 602-514-7210

Volume XXV – Number 84 | http://www.marketnews.usda.gov/mnp/fv-home | Date May 2, 2022

Prices represent open (spot) market sales by first handlers on product of generally good quality and condition unless otherwise stated and may include promotional allowances or other incentives. No consideration is given to after-sale adjustments unless otherwise stated. Reported prices generally include, but are not limited to, applicable brokerage fees and commissions, Customs fees and duties, U.S. packaging and U.S. freight costs prior to first sale, paid by the shipper/seller. Delivered Sales, Shipping Point Basis excludes all charges for freight after sale.

Basis of Sale Definitions:

Sales F.O.B. Shipping Point Basis - This means that the product quoted or sold is to be placed free on board the boat, car, or other agency of the through land transportation at shipping point, in "suitable shipping condition", and that the buyer assumes all risk of damage and delay in transit not caused by the seller irrespective of how the shipment is billed. The buyer shall have the right of inspection at destination before goods are paid for to determine if the product shipped complied with the terms of the contract or order at time of shipment, subject to the provisions covering suitable shipping conditions.

Delivered Sales, Shipping Point Basis - This means that the product is to be delivered by the seller on board the car, truck, or on the dock if delivered by boat, at the market in which the buyer is located, or at such other market as is agreed upon, free of any and all charges for transportation or protective service. The seller assumes all risks of loss or damage in transit not caused by the buyer.

BERRIES

OXNARD DISTRICT CALIFORNIA
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

STRAWBERRIES: DEMAND MODERATE. MARKET STEADY. Includes palletizing and cooling. Wide range in quality and condition. Many present shipments from prior bookings and/or previous commitments. Some berries being diverted to freezer and/or processor. flats 8 1-lb containers with lids med 9.00-12.00 mostly 9.00-10.00 occasional higher and lower

SALINAS-WATSONVILLE CALIFORNIA
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

STRAWBERRIES: DEMAND MODERATE. MARKET SLIGHTLY **HIGHER.** Includes palletizing and cooling. Wide range in quality. Most present shipments from prior bookings and/or previous commitments. flats 8 1-lb containers with lids exlge 10.00-12.00 occasional higher **ORGANIC** flats 8 1-lb containers with lids exlge 16.00-20.00 mostly 16.00-18.00 occasional higher

SANTA MARIA CALIFORNIA
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

STRAWBERRIES: DEMAND MODERATE. MARKET SLIGHTLY **HIGHER.** Includes palletizing and cooling. Wide range in quality and condition. Most present shipments from prior bookings and/or previous commitments.Some berries being diverted to freezer and/or processor. flats 8 1-lb containers with lids lge 9.00-12.00 mostly 10.00-12.00 occasional higher **ORGANIC** flats 8 1-lb containers with lids lge 16.00-20.00 mostly 16.00-18.00 occasional higher

NORTH CAROLINA
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

STRAWBERRIES: DEMAND VERY GOOD. MARKET ABOUT STEADY. Report issued Monday, Wednesday, and Friday. Includes palletizing and cooling. flats 8 1-lb containers with lids med-lge 16.00-18.00 mostly 16.00-17.00 some 20.00

SOUTH GEORGIA
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

BLUEBERRIES: DEMAND MODERATE. MARKET ABOUT STEADY. Includes palletizing and cooling. Quality generally good. flats 12 1-pt cups with lids lge 20.00-22.00 some 24.00, few prior commitments 26.00-28.00, occasional lower flats 12 6-oz cups with lids lge 14.00-18.00 mostly 14.00-16.00 few prior commitments higher and lower **ORGANIC** flats 12 6-oz cups with lids lge 20.00-24.00 few 26.00

CENTRAL & NORTH FLORIDA
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

BLUEBERRIES: DEMAND MODERATE. MARKET CONVENTIONAL PINTS **LOWER**, OTHERS ABOUT STEADY. Includes palletizing and cooling. Quality generally good. flats 12 1-pt cups with lids lge 22.00-25.00 mostly 24.00 few lower flats 12 6-oz cups with lids lge 14.00-16.00 mostly 14.00 occasional program sales higher **ORGANIC** flats 12 6-oz cups with lids lge 24.00-26.00 mostly 24.00 occasional higher and lower

MEXICO CROSSINGS THRU AZ, CALIFORNIA & TX
Sales F.O.B. Shipping Point and/or Delivered Sales, Shipping Point Basis

BLUEBERRIES: DEMAND LIGHT. MARKET PINTS SLIGHTLY **LOWER**, 6-OUNCE ABOUT STEADY. Includes palletizing and cooling. Wide range in quality. flats 12 1-pt cups with lids 18.00-22.00 mostly 20.00-22.00 occasional higher flats 12 6-oz cups with lids 12.00-16.00 mostly 12.00-14.00 occasional higher and lower

MISC BERRIES: DEMAND LIGHT. MARKET STEADY. Includes palletizing and cooling. Wide range in quality and condition. flats 12 6-oz cups with lids Blackberries 10.00-14.00 mostly 12.00 occasional higher and lower

RASPBERRIES: DEMAND FAIRLY LIGHT. MARKET ABOUT STEADY. Includes palletizing and cooling. Many present shipments from prior bookings and/or previous commitments. flats 12 6-oz cups with lids Red 16.00-20.00 mostly 16.00-18.00 occasional higher and lower

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Agricultural Marketing Service

National Retail Report – Specialty Crops

USDA
Agricultural Marketing Service

Specialty Crops Market News Division

National Retail Report - Specialty Crops

Websites: www.marketnews.usda.gov/mnp/fv-home and http://www.ams.usda.gov/mnreports/fvwretail.pdf and http://www.ams.usda.gov/mnreports/wa_lo100.txt

Volume XV - Number 42 | Issued Weekly | Friday, October 22, 2021

Advertised Prices for Specialty Crops at Major Retail Supermarket Outlets ending during the period of 10/16 to 10/28[1,2]

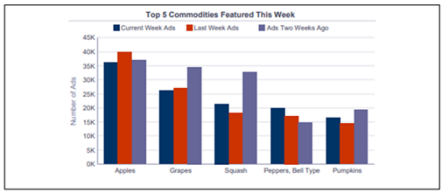
Pumpkins Galore

From miniature to pie varieties to jumbo-sized jack o' lanterns, pumpkins of all sizes decorated stores and ad flyers this week. Apples of many varieties are featured, perfect for bobbing or covering with caramel. Other fruits such as grapes, pears, persimmons, pomegranates, and cranberries continue to provide an autumn flavor to ads. Not to be outdone, vegetables like acorn and butternut squash, Brussels sprouts, and several varieties of potatoes and onions round out the harvest season offerings.

Total ad numbers this week were 301,907, a 5% decrease from last week's 316,370. Ad numbers this week were 1% lower than for the same week last year. The total number of ads broken out by commodity groups: fruit 149,944 (50% of all ads), onions and potatoes 23,214 (8%), vegetables 121,260 (40%), herbs 1,367, ornamentals 3,810, and hemp 2,312. The number of ads for organic produce was 44,695, 15% of total ads.

The following are the prices of major advertised items (3,000 plus stores) this week, compared to the same week last year. Significant increases in price for fruit this week included avocados at 31%, seedless grapes (black at 30%, white at 28%, red at 19%), Gala apples (3 lb bag at 24% and per pound at 22%), blackberries at 11%, and Honeycrisp apples at 10%. There were no significant decreases. The only significant increase in price for potatoes and onions was a 13% increase for Russet potatoes. There were no significant decreases. Significant increases in vegetable prices this week included pumpkins at 20%, baby carrots at 19%, and packaged salad (10-12 oz at 18%, 5-9 oz at 12%). There were no significant decreases.

For more detailed information on organic and locally grown produce visit the National Retail--Local and Organic Report at: http://www.ams.usda.gov/mnreports/wa_lo100.txt



1 - Specialty Crops Market News surveys over 400 retailers, comprising over 30,300 individual stores, with online weekly advertised features.
2 - Date range reflects one week of data collection ending on the report date and encompasses ad pricing good from the Saturday before the report release date through the following Friday.

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Specialty Crops Truck Rate Report

USDA SPECIALTY CROPS NATIONAL TRUCK RATE REPORT
Agricultural Marketing Service
Specialty Crops Market News
Email us with accessibility issues with this report.

October 27,2021

Page 1 FVWTRK

FRUIT AND VEGETABLE TRUCK RATE REPORT FOR TUESDAY OCTOBER 26, 2021

Rates quoted represent open (spot) market sales that shippers or receivers pay, depending on basis of sale, per load, including brokers' fees for shipments in truck load volume to a single destination. Extra charges for delivery to terminal markets, multi-pickup and multi-drop shipments are not included unless otherwise stated. Rates are based on the most usual loads in 48-53 foot refrigerated trailers from the origin shipping area to the destination receiving city. The ten cities of destination are Atlanta, Georgia; Baltimore, Maryland; Boston, Massachusetts; Chicago, Illinois; Dallas, Texas; Los Angeles, California; Miami, Florida; New York, New York; Philadelphia, Pennsylvania; and Seattle, Washington.

DISTRICT/REGION	TRUCK AVAILABILITY					
	Report Type	Surplus	Slight Surplus	Adequate	Slight Shortage	Shortage
MEXICO CROSSINGS THROUGH NOGALES ARIZONA						
KERN DISTRICT CALIFORNIA						
NORTHERN CALIFORNIA INCLUDING SAN JOAQUIN VALLEY	Last Report					
SALINAS-WATSONVILLE CALIFORNIA						
SAN JOAQUIN VALLEY CALIFORNIA						
SANTA MARIA CALIFORNIA						
SOUTH DISTRICT CALIFORNIA						
SAN LUIS VALLEY COLORADO						
IDAHO AND MALHEUR COUNTY OREGON						
UPPER VALLEY, TWIN FALLS-BURLEY DISTRICT IDAHO						
MICHIGAN						
MISSISSIPPI						
NEW YORK						
EASTERN NORTH CAROLINA						
MEXICO CROSSINGS THROUGH SOUTH TEXAS						
COLUMBIA BASIN WASHINGTON						
YAKIMA VALLEY AND WENATCHEE DISTRICT WASHINGTON						
CENTRAL WISCONSIN						

USDA, AMS, Specialty Crops Market News
1400 Independence Avenue Room 1529-S
Washington, DC 20250
Phone (202) 720-2175 | FAX (202) 720-0011

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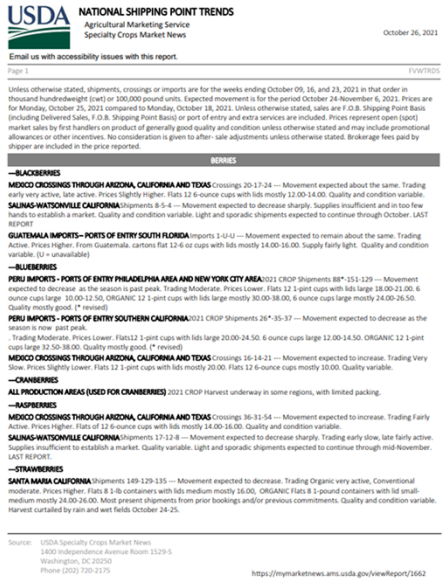
Fresh Fruit and Vegetable National Shipping Point Trends



USDA NATIONAL SHIPPING POINT TRENDS
Agricultural Marketing Service
Specialty Crops Market News
October 26, 2021

Email us with accessibility issues with this report.

Page 1 FVWTRDS

Unless otherwise stated, shipments, crossings or imports are for the weeks ending October 09, 16, and 23, 2021 in that order in thousand hundredweight (cwt) or 100,000 pound units. Expected movement is for the period October 24-November 6, 2021. Prices are for Monday, October 25, 2021 compared to Monday, October 18, 2021. Unless otherwise stated, sales are F.O.B. Shipping Point Basis (including Delivered Sales, F.O.B. Shipping Point Basis) or port of entry and extra services are included. Prices represent open (spot) market sales by first handlers on product of generally good quality and condition unless otherwise stated and may include promotional allowances or other incentives. No consideration is given to after- sale adjustments unless otherwise stated. Brokerage fees paid by shipper are included in the price reported.

BERRIES

—BLACKBERRIES

MEXICO CROSSINGS THROUGH ARIZONA, CALIFORNIA AND TEXAS Crossings 20-17-24 --- Movement expected about the same. Trading early very active, late active. Prices Slightly Higher. Flats 12 6-ounce cups with lids mostly 12.00-14.00. Quality and condition variable.

SALINAS-WATSONVILLE CALIFORNIA Shipments 8-5-4 --- Movement expected to decrease sharply. Supplies insufficient and in too few hands to establish a market. Quality and condition variable. Light and sporadic shipments expected to continue through October. LAST REPORT.

GUATEMALA IMPORTS– PORTS OF ENTRY SOUTH FLORIDA Imports 1-U-U --- Movement expected to remain about the same. Trading Active. Prices Higher. From Guatemala. cartons flat 12-6 oz cups with lids mostly 14.00-16.00. Supply fairly light. Quality and condition variable. (U = unavailable)

—BLUEBERRIES

PERU IMPORTS - PORTS OF ENTRY PHILADELPHIA AREA AND NEW YORK CITY AREA 2021 CROP Shipments 88*-151-129 --- Movement expected to decrease as the season is past peak. Trading Moderate. Prices Lower. Flats 12 1-pint cups with lids large 18.00-21.00. 6 ounce cups large 10.00-12.50, ORGANIC 12 1-pint cups with lids large mostly 30.00-38.00, 6 ounce cups large mostly 24.00-26.50. Quality mostly good. (* revised)

PERU IMPORTS - PORTS OF ENTRY SOUTHERN CALIFORNIA 2021 CROP Shipments 26*-35-37 --- Movement expected to decrease as the season is now past peak.
. Trading Moderate. Prices Lower. Flats12 1-pint cups with lids large 20.00-24.50. 6 ounce cups large 12.00-14.50. ORGANIC 12 1-pint cups large 32.50-38.00. Quality mostly good. (* revised)

MEXICO CROSSINGS THROUGH ARIZONA, CALIFORNIA AND TEXAS Crossings 16-14-21 --- Movement expected to increase. Trading Very Slow. Prices Slightly Lower. Flats 12 1-pint cups with lids mostly 20.00. Flats 12 6-ounce cups mostly 10.00. Quality variable.

—CRANBERRIES

ALL PRODUCTION AREAS (USED FOR CRANBERRIES) 2021 CROP Harvest underway in some regions, with limited packing.

—RASPBERRIES

MEXICO CROSSINGS THROUGH ARIZONA, CALIFORNIA AND TEXAS Crossings 36-31-54 --- Movement expected to increase. Trading Fairly Active. Prices Higher. Flats of 12 6-ounce cups with lids mostly 14.00-16.00. Quality and condition variable.

SALINAS-WATSONVILLE CALIFORNIA Shipments 17-12-8 --- Movement expected to decrease sharply. Trading early slow, late fairly active. Supplies insufficient to establish a market. Quality variable. Light and sporadic shipments expected to continue through mid-November. LAST REPORT.

—STRAWBERRIES

SANTA MARIA CALIFORNIA Shipments 149-129-135 --- Movement expected to decrease. Trading Organic very active, Conventional moderate. Prices Higher. Flats 8 1-lb containers with lids medium mostly 16.00, ORGANIC Flats 8 1-pound containers with lid small-medium mostly 24.00-26.00. Most present shipments from prior bookings and/or previous commitments. Quality and condition variable. Harvest curtailed by rain and wet fields October 24-25.

Source: USDA Specialty Crops Market News
1400 Independence Avenue Room 1529-S
Washington, DC 20250
Phone (202) 720-2175

https://mymarketnews.ams.usda.gov/viewReport/1662

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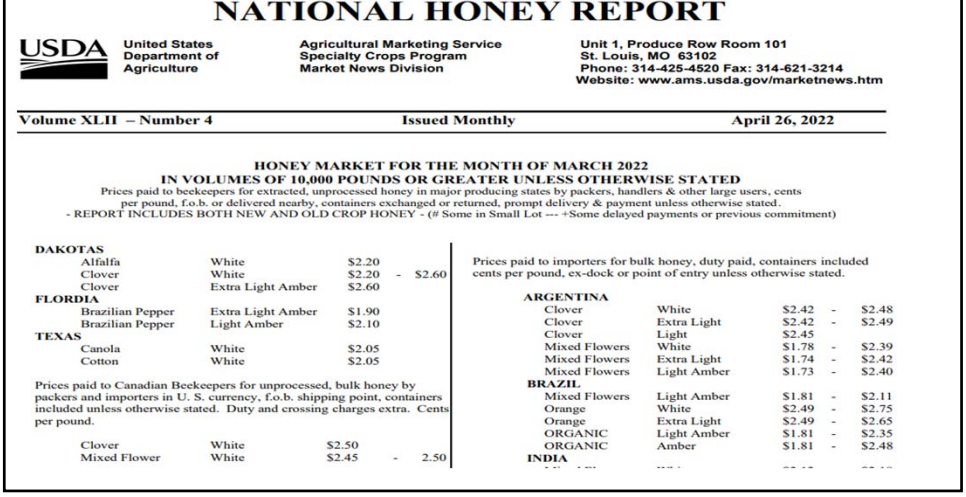
NATIONAL HONEY REPORT



NATIONAL HONEY REPORT

USDA United States Department of Agriculture

Agricultural Marketing Service
Specialty Crops Program
Market News Division

Unit 1, Produce Row Room 101
St. Louis, MO 63102
Phone: 314-425-4520 Fax: 314-621-3214
Website: www.ams.usda.gov/marketnews.htm

Volume XLII – Number 4 **Issued Monthly** **April 26, 2022**

HONEY MARKET FOR THE MONTH OF MARCH 2022
IN VOLUMES OF 10,000 POUNDS OR GREATER UNLESS OTHERWISE STATED

Prices paid to beekeepers for extracted, unprocessed honey in major producing states by packers, handlers & other large users, cents per pound, f.o.b. or delivered nearby, containers exchanged or returned, prompt delivery & payment unless otherwise stated.
- REPORT INCLUDES BOTH NEW AND OLD CROP HONEY - (# Some in Small Lot --- +Some delayed payments or previous commitment)

DAKOTAS			
Alfalfa	White	$2.20	
Clover	White	$2.20 -	$2.60
Clover	Extra Light Amber	$2.60	
FLORDIA			
Brazilian Pepper	Extra Light Amber	$1.90	
Brazilian Pepper	Light Amber	$2.10	
TEXAS			
Canola	White	$2.05	
Cotton	White	$2.05	

Prices paid to Canadian Beekeepers for unprocessed, bulk honey by packers and importers in U. S. currency, f.o.b. shipping point, containers included unless otherwise stated. Duty and crossing charges extra. Cents per pound.

Clover	White	$2.50	
Mixed Flower	White	$2.45 -	2.50

Prices paid to importers for bulk honey, duty paid, containers included cents per pound, ex-dock or point of entry unless otherwise stated.

ARGENTINA			
Clover	White	$2.42 -	$2.48
Clover	Extra Light	$2.42 -	$2.49
Clover	Light	$2.45	
Mixed Flowers	White	$1.78 -	$2.39
Mixed Flowers	Extra Light	$1.74 -	$2.42
Mixed Flowers	Light Amber	$1.73 -	$2.40
BRAZIL			
Mixed Flowers	Light Amber	$1.81 -	$2.11
Orange	White	$2.49 -	$2.75
Orange	Extra Light	$2.49 -	$2.65
ORGANIC	Light Amber	$1.81 -	$2.35
ORGANIC	Amber	$1.81 -	$2.48
INDIA			

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What's Next?

- *My Market News*
  - Enhanced search tools, including an Application Program Interface (API)
  - Created ability to receive more information directly, requiring less manual input and data handling
  - Expanded public access to larger data sets

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Agricultural Marketing Service

Questions?

USDA

USDA SPECIALTY CROPS
MARKET NEWS

105 Years of Service
1915~2020
Compete Smarter

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USDA, AMS, Specialty Crops Market News Division: The Eyes and Ears of American Agriculture, A. Zaki, National Shipping Point Supervisor, USDA Specialty Crops Market News (10 minutes, virtual)

- To provide timely, accurate, and unbiased info on current agriculture markets
- Cover: shipping point, terminal/wholesale, retail - advertised weekly markets, farmers markets and producer auctions
- Movement data – shipments, domestic (truck, rail), crossings from Canada and Mexico (trucks, air, boat)
- Automated commercial environment – US customs and border
- Reports:
- National FOB
- National retail report
- Specialty crop truck rate report
- Fresh fruit and veg national shipping point trends
- National honey report
- What's next? My market news – enhanced search tools, ability to retrieve info
- Custom report of all passion fruit being sold in US – date, market, origin, color of fruit, organic?, high, low, average wholesale prices

6-14/15-2022 passion fruit conference

Photo credits: JH Crane, UF/IFAS, TREC

Pest control: status of conventional and organic pest control for U.S. passionfruit©

JONATHAN H. CRANE, TROPICAL FRUIT CROPS SPECIALIST

UNIVERSITY OF FLORIDA, IFAS

TROPICAL RESEARCH AND EDUCATION CENTER

HOMESTEAD, FL

UF UNIVERSITY of FLORIDA IFAS Extension

1

Plant selection and propagation

CULTIVAR

- Disease resistance
- Diseases tolerance
- Environmental tolerances
  - Excessively wet soils
  - High or low pH soils
  - Salinity tolerance
  - Drought tolerance
  - Cold tolerance

PROPAGATION ISSUES AND METHODS

- Vegetative propagation – cuttings
- Testing propagation material to be disease-free prior to propagating
- Especially virus testing
- Purchase tissue cultured plants known to be free of disease issues

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2

Examples – test mother plants for potyvirus prior to their use

Do not use virus infected plants to propagate new plants

Consequences

- Vine decline
- Nutrient deficiencies
- Reduced flowering + production
- Mishappen fruit, poor seed set and aril development
- Reduced vine longevity
- Contamination of adjacent vines through aphid vector feeding

Photo credits: JH Crane, UF/IFAS and UF/IFAS TREC Plant Diagnostic Clinic

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3

Trellis and plant spacing – light exposure, wind movement, equipment and personnel movement

PASSIONFRUIT

RECOMMENDED

- 13-15 ft between trellis rows
- 10-15 ft between vines in-row
- Wider spacings allows more light and air movement and dries the vines out more quickly after rainfall events

Photo credits: JH Crane, UF/IFAS, TREC

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4

Irrigation systems to meet water needs and prevent freezing temperature damage

Microsprinkler

- Mainly – irrigation
- Limited cold protection

Drip

- Mainly –irrigation
- No cold protection

High volume under vine

High volume over vine

- Mainly cold protection
- Irrigation but gets the vines wet – increased disease potential

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Overhead and microsprinkler irrigation systems

Potential for more disease of vines and fruit (but good for cold protection)

Reduced potential for diseases of aerial parts of vines

Photo credits: JH Crane, UF/IFAS, TREC

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6

Irrigation management

SPRAY PATTERN

- Drip – may need more than one line per row to enlarge soil moisture footprint
- Potential to place microsprinkler between vines or one/vine
- Microsprinkler pattern downward, avoid vine trunk

TIMING

- Frequency – based on weather, plant stage of development (e.g., high temperatures, drought period, plants flowering and/or fruiting)
- Sprinkler use best early morning when winds are low – less irrigation pattern distortion

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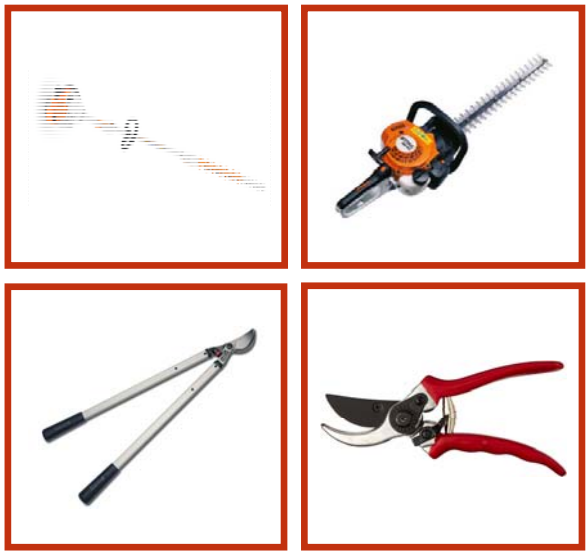
7

Pruning purpose

Remove	Rejuvenate	Control	Improve
Remove diseased and dead vine	Rejuvenate the vine – initiate new growth	Control vine size	Improve light and air movement – reduced disease and insect potential



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Passionfruit pruning

- Pruned during dormant period (late winter-early spring) just as new growth begins
- May be cut back to major vine laterals near the base
- Remove old vine (thatch)
- Vines may be pruned (hedged) during additional times of the year to improve sun exposure and air movement

Photo credits: JH Crane, UF/IFAS, TREC

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9

Weed control

Purpose

- Control (eliminate) competition for water and nutrients
- Reduce habitat for insect and disease pests

Options

- Herbicides
- Ground cloth
- Mulch
- Weed barriers

Photo credits: JH Crane, UF/IFAS, TREC

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10

Pest control

Become familiar with identification of pests (insects and diseases)

Pest identification

Typical weather conditions when a particular pest occurs

Become familiar with identification of beneficials

Scout the planting frequently

Be aware of neighboring crops and environments

Control tactics

Cultural practices –

- Cultivar selection
- Infrastructure – e.g., irrigation type
- Irrigation and pruning practices
- Scouting frequently
- Monitoring weather conditions

- Pest control options
  - Cultural practices
  - Least environmentally disruptive pest control substances progressing to more aggressive substances

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Pest control and weather conditions

- Monitor the National Weather Service and other sources for current, daily and weekly rainfall predictions
  - Avoid applications when rainfall is immanent
  - May allow you to increase the interval between fungicide sprays
  - May allow delay of a pesticide application that would be washed off because of rainfall

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12

Pest control products (see handout)

- Range of conventional and organic products (see handout)
- Try products with least potential for negative impacts on the environment and beneficial insects first
- You must follow label instructions for use

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Thanks. Questions?

Photo credits: JH Crane, UF/IFAS, TREC

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14

Status of conventional and organic pest control for U.S. passionfruit, J. Crane, University of Florida (10 minutes)

- Cultivar – disease resistance, tolerance, environmental tolerances (wet soil, high/low soil pH, salinity tolerance, drought tolerance, cold tolerance)
- Propagation issues – vegetative, testing propagation, virus testing, purchase disease free
- Potyvirus – test mother plant – do not use infected vines
- Trellis and spacing – 13-15ft between rows, 10-15 between vines, wider allows more light and air movement and to dry vines out more quickly after rain
- Closer to equator –> less important orientation of row (north-south, east-west)
- Freeze protection – air drainage is important – wind barriers
- Irrigation – micro-sprinklers, drip, high volume over or under vine
- Overhead and micro-sprinkler – potential for more disease but good for cold protection
- Spray pattern – drip – may need more than one line per row to enlarge soil moisture footprint, potential to replace sprinkler between vines or one per vine, sprinkler pattern downward, avoid vine trunk
- Timing – frequency – based on weather, plant stage of development, temp, drought, fruiting period, flowering period
- Sprinkler best in early morning when winds are low – less pattern distortion
- Pruning – remove diseased, rejuvenate, control size, improve light and air movement
- Pruned during dormant period (late winter-early spring) as new growth begins, may be cut back to major vine laterals near the base, remove old vine (thatch), may be pruned (hedged) during additional times of the year to improve sun exposure and air movement
- Weed control – control competition for water and nutrients, reduce habitat for disease/pests, herbicides, ground cloth
- Become familiar with pest ID, ID beneficials
- Control of pests – cultural practices – cultivar selection, infrastructure, irrigation and pruning, scouting, monitor weather conditions
- Least environmentally disruptive pest control substances progressing to more aggressive substances
- Monitor weather – avoid app when rainfall is immanent, may allow you to increase interval between sprays, may allow delay of pesticide applications that would be washed off
- Pest control products – see handout – range of conventional and organic products
- Honeybees do some pollination – not great at it – may have honeybees and hand pollinate – hand pollination cultivar dependent

Passion Fruit Canker

Josh Anderson
PhD Student

University of Florida
Horticultural Sciences

1

THE SIGHTGEIST Jon Kudelka

2

Maracuyá …. Passion fruit

John Smith
Explorer

Described cultivation by the Native Americans

Creek (aka: Muscogee) people of Florida

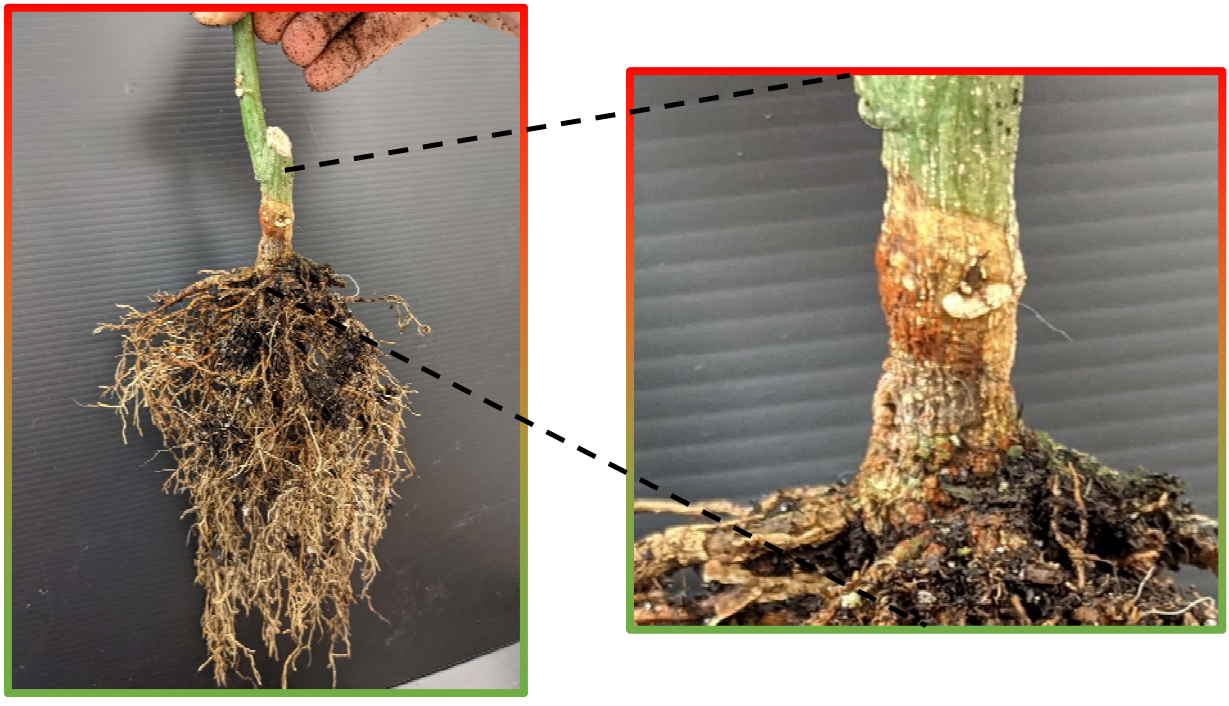
Names common indigenous origin (Kugler and King, 2004)

- Maracock or Maricock (Algonkian, Virginia)
- Mahcawq (Powhata, Virginia)
- Maypop (Southeastern, US)
- Merécuya (Caribbean, Guadeloupe)
- Mburucujâ (Guarani South America)
- Múrucuya, Múrucuja, maracujá (Tupi, South America)

The words “muru” and “cuya” are related to meal and container or “food in form of a gourd” (Faleiro et al., 2005; Kugler and King, 2004).

3

3



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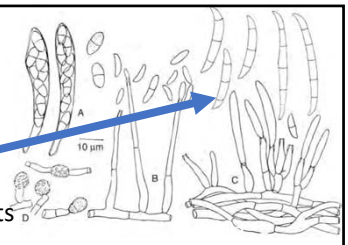
General Pathogen Biology



- *Fusarium* species are rhizosphere competent
  - Good saprotrophs surviving on dead plant material or colonizing weed hosts
  - Soil inhabitant, always maintaining a significant inoculum level in the soil
  - Rain splash dispersed
- Fusarium infection causes
  - Hypertrophy (increase cell size) and hyperplasia (increase cell reproduction rate) of the cambium
  - Discolored vasculature up to 2 meters above soil line
- Factors expediting disease
  - Younger age of plants
  - Wounding
  - Insect pathogen propagule distribution
  - Damage by ants
  - Cooperative rotting pathogens
  - Stress

(Fischer and Rezende, 2008; Ortiz et al., 2014; Cedeño et al., 1990; Cole et al., 1992; Manicom et al., 2003)

5

5

Generalizations:

Canker **vs** **Wilt**

Fusarium solani

- At soil level only
- Usually, no spread in plant
- Canker, swollen dying stem at base
- Can reproduces w/unique & clonal spores
- Cause wilts
- Stress pathogen

Fusarium oxysporum

- Spreads in plant
- One-sided
- Immediately thirsty plant
- Reproduces w/clonal spores

6

6

7

What are those red dots?

8

8

Inoculation Methods

a. Inoculum drench (Spring 2019)

b. Drill injection (Dec-Feb 2020)

c. Root dip, razor cut w/agar plug, drill inject (Feb-May 2021)

d. Flood stress, TREC soil, millet-seed inoculum (May - Aug 2021)

e. Razor wound w/Agar plug, TREC sterilized soil (Jan-May 2022)



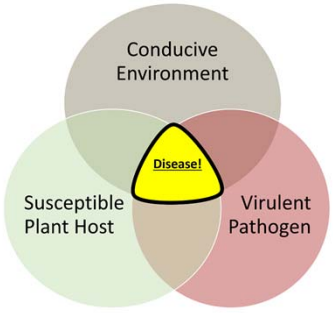


9

Grower Management

1. Weed control
   - Do not hand pull, causes root wounds
   - Weeds compete for soil nutrients
2. Use virus free plants
3. Avoid excess water or drought
   - Well draining soil
   - Shallow roots: frequent water but not flooding
4. Soil
   - Use clean/sterile potting mix
   - Amend w/organic matter
   - Regular fertilizer
5. Destroy infected plants
   - Sanitize after handling (hands, tools, etc.)

Disrupt disease triangle



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Thank you! Enjoy passion fruit!

Acknowledgements

- Lab group (Alan Chambers, Maria Brym, interns: Nathan Latty, Angie Guzman, etc)
- Committee (Romina Gazis, Jonathan Crane, Marcio Resende)
- Brooks Tropical's
- UF Plant Breeding Working Group

11

11

Passion Fruit Stem Canker, J. Anderson, University of Florida (10 minutes)

- Maracuya – cultivation described by Native Americans – Muscogee people of FL
- Bottom base of stem – plant is dying from infection from fungus
- Fusarium species are rhizosphere competent – good saprotrophs, soil inhabitants, rain splash dispersed
- Infection causes hypertrophy, hyperplasia of cambium, discoloration of vasculature – up to 2 m above soil line
- Factors – younger plant, stress, insects
- Canker (at soil level only, usually not spread in plant, canker, swollen dying stem at base, can reproduce w/ unique and clonal spores, causes wilts, stress pathogen) vs wilt (spreads in plant, one sided, immediately notice thirsty plant, clonal spores)
- Red dots – ascospores
- Inoculation methods – 1. inoculum drench, 2. drill injection, 3. root dip, razor cut w/ agar plug, drill inject, 4. Flood stress, Tropical Research and Education Center (TREC) soil, millet seed inoculum, 5. Razor wound w/ agar plug, TREC sterilized soil
- Grower management – disease triangle (environment, susceptible host, pathogen)
- Weed control – do not hand pull, causes root wounds, weeds compete for soil nutrients
- Use virus-free plants
- Avoid excess water/drought – well draining soil, shallow roots – frequent water but not flooding
- Soil – use clean/sterile potting mix, amend w/ organic matter, regular fertilizer
- Destroy infected plants – sanitize after handling (hands, tools)
- Amendments to help plant grow better – promote health of plant

Phenotypic and Genotypic variability of Colombian purple passion fruit (*P. edulis* f. *edulis*)

Dra. Nohra Rodriguez Castillo (Univalle/Universidad Nacional)
Dr. Matthew W. Blair (Tennessee State University)

Passion Fruit Meeting / Homestead (UF) Florida, USA
June 15, 2022

Passion Fruit Class : Gulupa

Passiflora edulis has two sub-types (forms):
f. *flavicarpa* and f. *edulis*

- First one is Maracuya (Brazilian origin)
- Second one is Gulupa (North Andes origin)
- Tolerance of cooler temperatures, as the gulupas can grow at elevations above 2500 masl. In the tropics and are probably the source of cold tolerance in Taiwan/China breeding programs

Importance of Colombian Germplasm

- The South American country of Colombia is one of the main centers of diversification of the *Passiflora* genus and particularly of the purple passion fruit species, *P. edulis* f. *edulis*.
- The plant grows wild in many parts of the country and is especially prevalent as landraces at mid-elevation altitudes of the Andes Mountains.
- Purple passion fruits are very tall viny plants often found in forest margins or cacao and coffee plantations and grow to altitude of 2400 masl.
- Yellow passion fruit (f. *flavicarpa*) and crosses between the two forms grow in lower elevation valleys usually between 400 to 1200 masl.

Hillside growing environments for Purple Passion Fruit

First Study : Eco-physiological

agronomy

MDPI

Article

Purple Passion Fruit, *Passiflora edulis* Sims f. *edulis*, Variability for Photosynthetic and Physiological Adaptation in Contrasting Environments

Nohra C. Rodríguez [1], Luz M. Melgarejo [1,*] and Matthew W. Blair [2,*]

1 Laboratorio de Fisiología y Bioquímica Vegetal, Departamento de Biología, Facultad de Ciencias, Universidad Nacional de Colombia, Bogotá 111321, Colombia; ncrodriguezc@unal.edu.co

2 Department of Agricultural and Environmental Sciences, Tennessee State University, Nashville, TN 37209, USA

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Goal and Hypothesis

- The goal of this project was to evaluate photosynthetic and physiological variability for a collection of 50 landrace and weedy gulupa
- With the hypotheses that Colombian gulupa landraces contained the diversity to adapt to higher elevation, non-traditional growing environments and this is dependent on specific parameters of ecological adaptation.

Materials and Methods

- A total of 50 genotypes of this crop were chosen from divergent sources for evaluations of their eco-physiological responses in two equatorial locations at different altitudes in the Andes Mountains, a center of diversity for the species.
- The germplasm included 34 landraces, 8 commercial cultivars, and 8 gene bank accessions from Agrosavia (National Agricultural Research Institute of Colombia).
- Represented farms in the Colombian areas of Antioquia, Boyacá, Cauca, Cundinamarca, Huila, Nariño, Putumayo, Quindío, Risaralda, Santander, Santander del Norte, and Tolima
- Two locations contrasting in climates, representing mid and high elevations were chosen.
  - Mid-elevation valleys are typical regions of production for passion fruit
  - High elevation sites are not traditional.

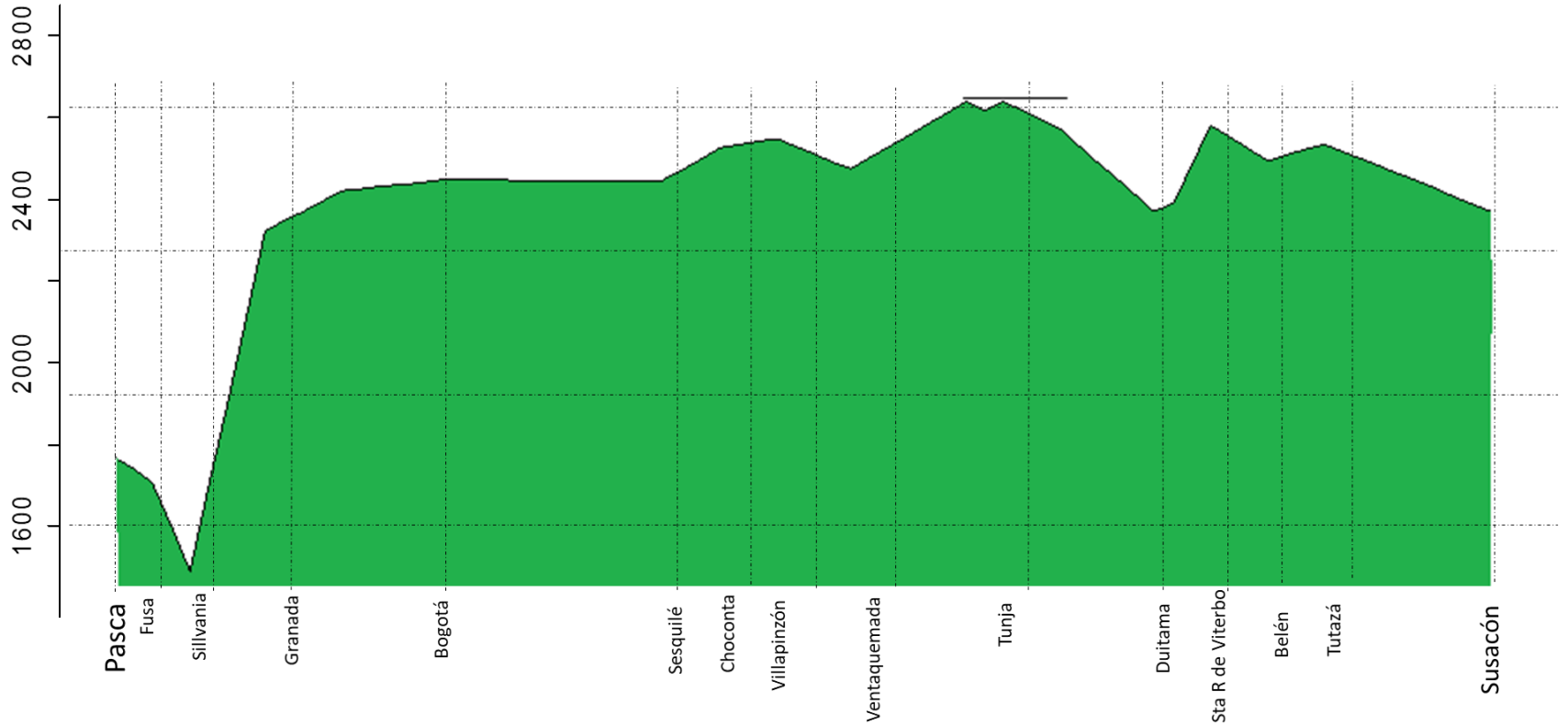
Research locations

Altitude:

Boyacá
(Susacón)
2400 masl

Cundinamarca
(Pasca)
1800 masl

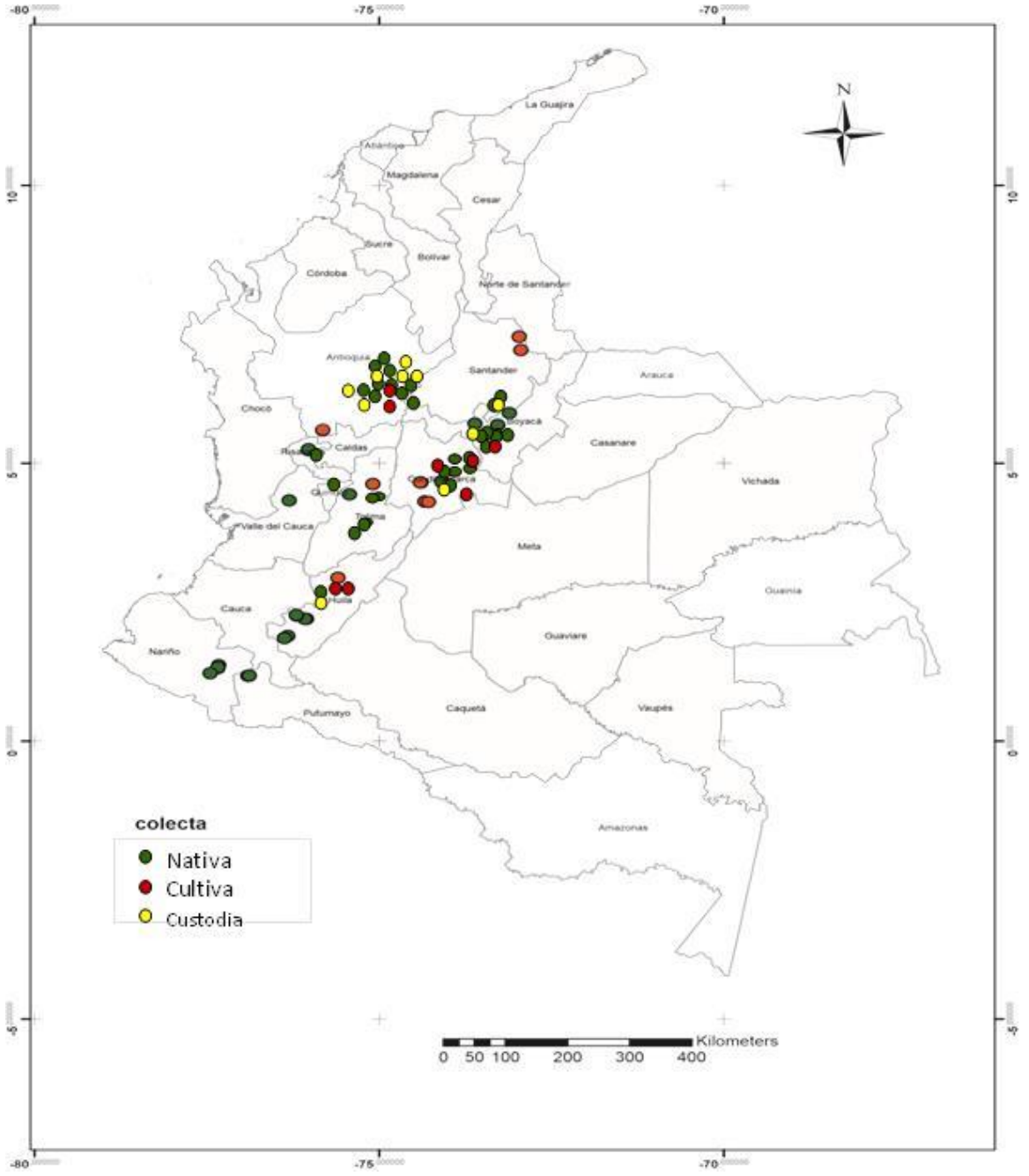
Altiplano – Boyacá Cundinamarca



Collection sites

Various Depts.

Antioquia
Boyacá
Caldas
Cundinamarca
Huila
Nariño
Putumayo
Risaralda
Santander
Tolima
Valle



Physiological Parameters

- Agroecological parameters of water status, gas exchange, chlorophyll fluorescence were measured
- Photosynthetically active radiation (PAR) was evaluated with LI 190 B sensors on a LI-COR6400
- Leaf water potential (Ψf) was measured during fruiting stage with a Schöllander pump two times in the same day, prior to dawn (4:00 a.m., Ψ4) and at mid-day (12:00 p.m., Ψ12)
- Soil water potential (Ψs) was measured with a vacuum gauge tensiometer at vine base. Atmospheric water potential (Ψa) and vapor pressure deficit (VPD) were then calculated.
- Transpiration rate (E), photosynthetic rate (A), stomatal conductance (gs) were measured with an IRGA gas analyzer
- Water use efficiency (WUEe, WUEi) were estimated from data

Results

- Overall showed statistically significant differences between locations and importance of physiological parameters related to photosynthesis and water use efficiency.
- Some landraces exhibited better water status and gas exchange than commercial types.
- Parameters like maximum photosynthesis, points of light saturation and compensation, darkness respiratory rate, and apparent quantum yield varied between genotype groups.
- The landraces, commercial types, and genebank entries also differed in content of carotenoids and chlorophylls a and b.
- Photosynthesis measurements showed that altitudinal difference had an effect on genotype-specific plant growth and adaptation.

Part 2: Seed Phenotypes

frontiers in Plant Science

ORIGINAL RESEARCH
published: 29 May 2020
doi: 10.3389/fpls.2020.00498

Check for updates

Seed Structural Variability and Germination Capacity in *Passiflora edulis* Sims f. *edulis*

Nohra Rodríguez Castillo[1], Luz Marina Melgarejo[1] and Matthew Wohlgemuth Blair[2]**

[1] Laboratory of Plant Physiology and Biochemistry, Department of Biology, Universidad Nacional de Colombia, Bogotá, Colombia, [2] Department of Agricultural and Environmental Sciences, Tennessee State University, Nashville, TN, United States

- Goal: Analyze seed anatomy of purple passion fruit genotypes to determine differences between wild collected and commercial types, and effects on seedling germination

Results of Seed Study

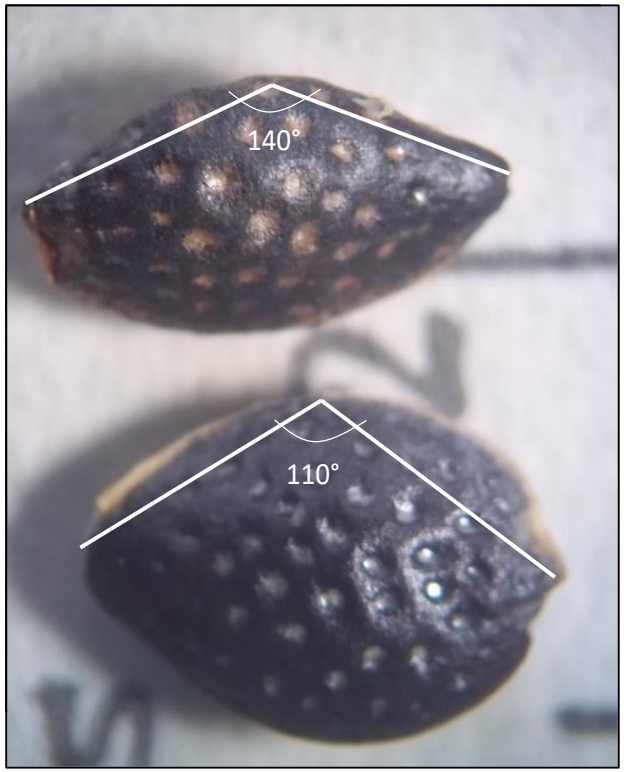
- A total of 12 morphometric descriptors related to seed anatomy were evaluated in 50 genotypes
- Germination was found to be positively correlated with the number ($r = 0.789$) and depth ($r = 0.854$) of seed pitting.
- Seeds of commercial cultivars had more seed pits and higher germination compared to seeds of landraces or gene bank accessions showing a possible effect of domestication on the crop.

Seed Measurement / Color

Shape of Seed and Pitting

(a)

(b)



- Photograph showing the angle between the central axis of the purple passion fruit seed and the seed tips at each vertices for semi-elliptical (a) and elliptical seed (b).
- Seed pitting is observable on both elliptical and oval seeds as well as the difference between color variants.

Cross sections of seed

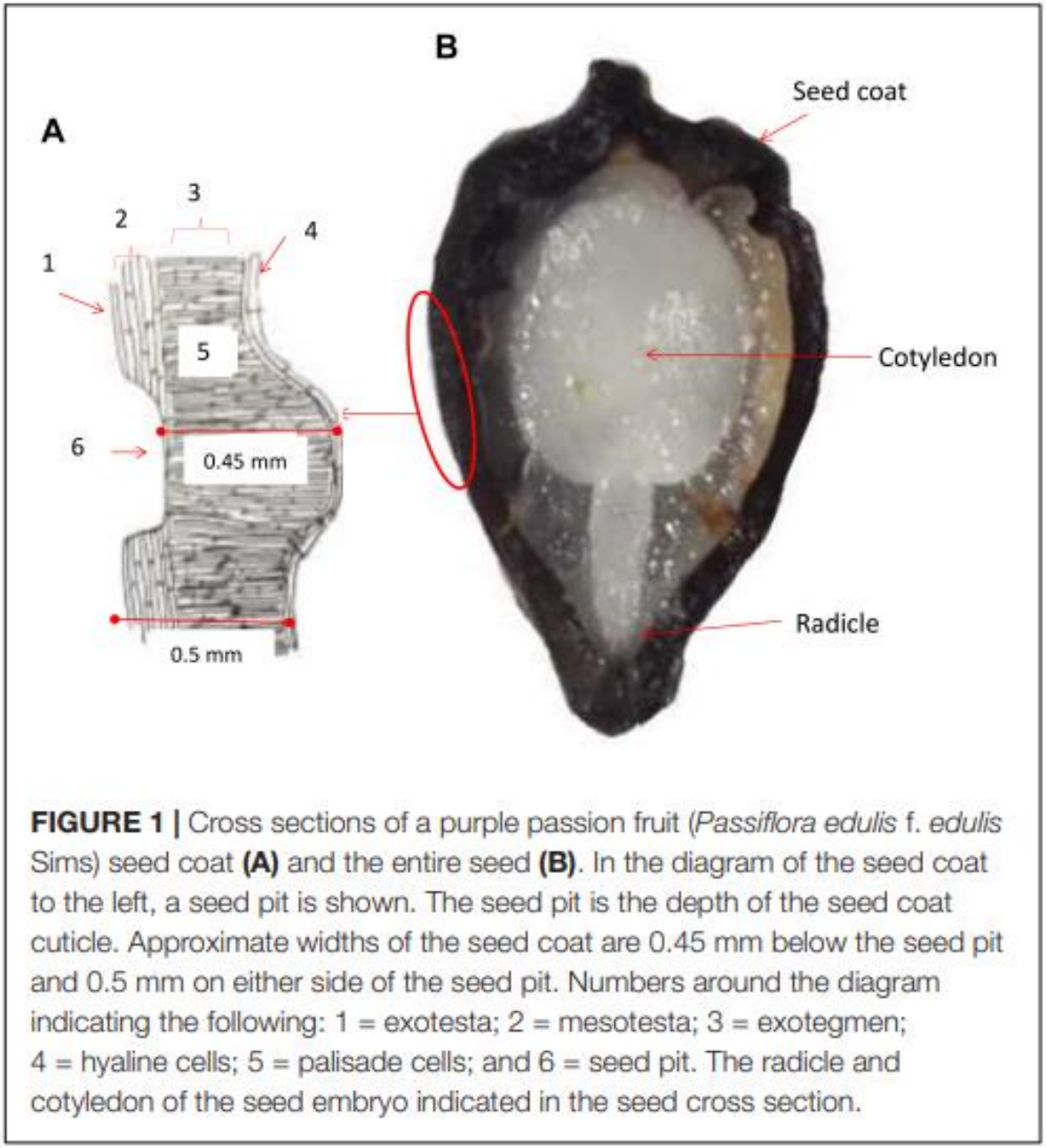


FIGURE 1 | Cross sections of a purple passion fruit (*Passiflora edulis* f. *edulis* Sims) seed coat **(A)** and the entire seed **(B)**. In the diagram of the seed coat to the left, a seed pit is shown. The seed pit is the depth of the seed coat cuticle. Approximate widths of the seed coat are 0.45 mm below the seed pit and 0.5 mm on either side of the seed pit. Numbers around the diagram indicating the following: 1 = exotesta; 2 = mesotesta; 3 = exotegmen; 4 = hyaline cells; 5 = palisade cells; and 6 = seed pit. The radicle and cotyledon of the seed embryo indicated in the seed cross section.

Part 3: Genotyping

diversity

MDPI

Article

Genetic Diversity of Purple Passion Fruit, *Passiflora edulis* f. *edulis*, Based on Single-Nucleotide Polymorphism Markers Discovered through Genotyping by Sequencing

Nohra Cecilia Rodriguez Castillo [1,2], Xingbo Wu [3], María Isabel Chacón [4], Luz Marina Melgarejo [1] and Matthew Wohlgemuth Blair [3,*]

1 Laboratorio de Fisiología y Bioquímica Vegetal, Departamento de Biología, Facultad de Ciencias, Universidad Nacional de Colombia, Bogotá, D.C. 111321, Colombia; nohra.rodriguez@uptc.edu.co (N.C.R.C.); lmmelgarejom@unal.edu.co (L.M.M.)

2 Escuela de Biología, Facultad de Ciencias, Grupo de Investigación GEBIMOL, Universidad Pedagógica y Tecnológica de Colombia, Tunja 153610, Boyacá, Colombia

3 Department of Agricultural and Environmental Sciences, College of Agriculture, Tennessee State University, Nashville, TN 37209-1561, USA; xwubeans@gmail.com

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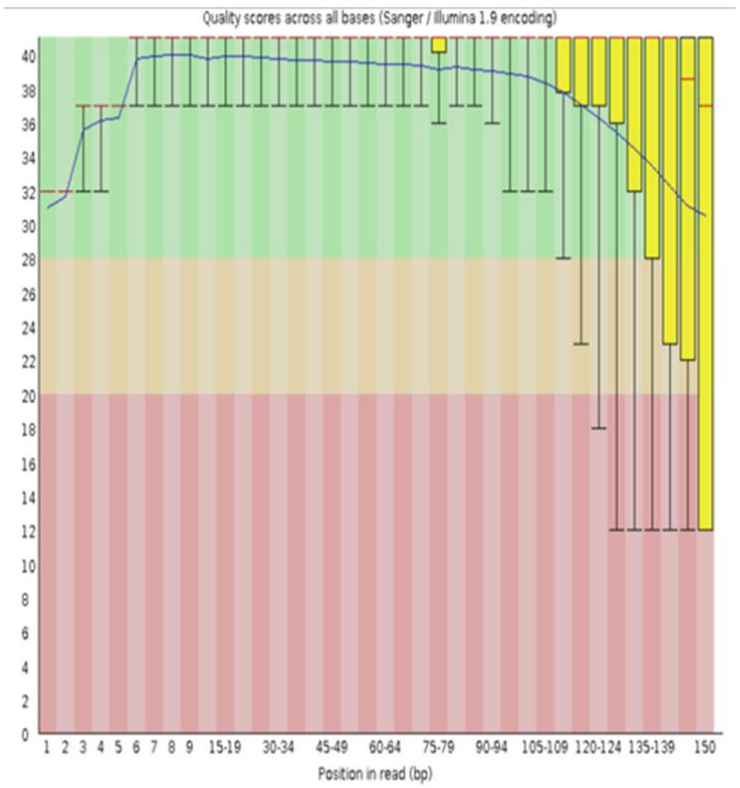
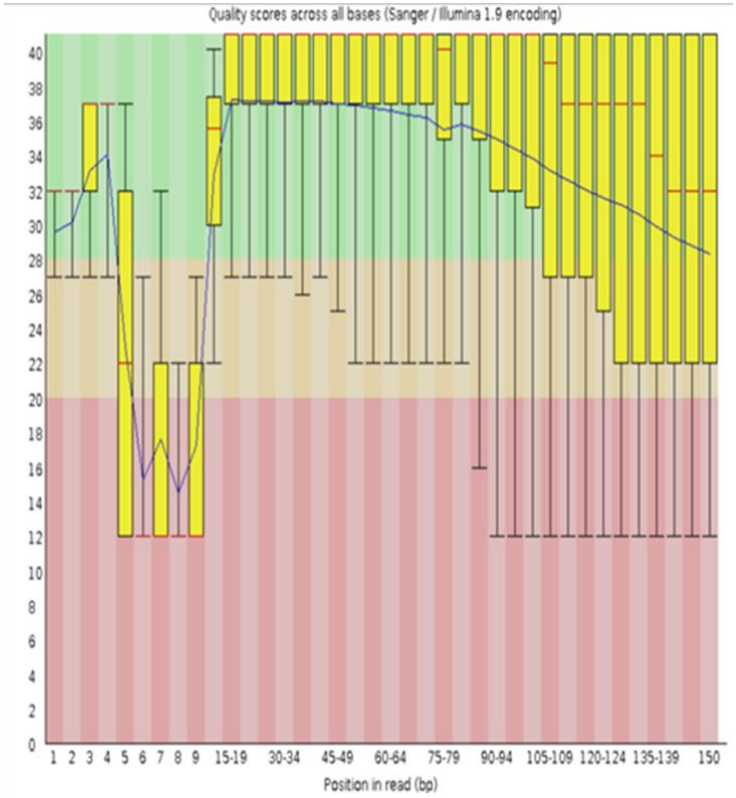
Genotyping by Sequencing (GBS)

- GBS was carried out with 88 purple gulupas (f. *edulis*) and 5 yellow maracuyas from Colombian collections and breeding programs
- Total of 3,820 SNPs were identified as informative. However, the majority distinguished yellow and purple passion fruit. This compares well to the 5,650 found for *P. edulis* by J. Anderson.
- However of the total 966 SNPs were useful in *P. edulis* f. *edulis* or purple passion fruits alone showing need for more SNP discovery.
- Population structure analysis showed purple passion fruits were very distinct from the yellow ones in Colombia, evidence of sub-speciation of the forms f. *edulis* and f. *flavicarpa*.
- Purple passion fruits had reduced diversity in the commercial cultivars and higher diversity among landraces from wild or semi-wild conditions, showing the importance of maintaining diversity.

Quality Scores

- Paired End Reads for larger fragment reads
- *Pst*I enzyme generated higher GC% fragments





Some take home lessons

- Variability for seed size and color traits
- Adaptation potential measured by photosynthetic evaluations with carotenoids
- Genome Wide Association Studies and Marker Assisted Selection will probably require more SNP discovery by resequencing of range of purple and yellow passion fruits
- Breeding for cold tolerance may need to look more widely at more purple passion fruits
- Status of sub-forms of P. edulis, history of breeding and possibility of interspecific crosses for other quality traits all need further genetic research.

Southeast regional species

Maypop. *Passiflora incarnata*
(the Tennessee state wild flower / fruit, established early 1900 by a vote put to school children, showing the wide consumption and use of the Maypop fruit before other Tropical and Fall fruits became available)

Production potential
in Southeastern states
Using hoophouses

Mississippi State University
Inter-specific crosses between *P. edulis* and *P. incarnata*

Acknowledgements

Personnel:
UNAL: Dr. Nohra Rodriguez Castillo (PhD), Luz Marina Melgarejo (Prof.), Maria Isabel Chacón (Prof.)

TSU: Dr. Xingbo Wu, Dr. Daniel Demissie (PhD students at time)

Funding: Colciencias, Universidad Nacional de Colombia, 1890s Evans Allen Fund, USDA-NIFA and Fulbright Department of State.

Gulupo-logos at work need time and dedication

Thanks for your attention

Seed Structure Differences and Genetic/Phenotypic Variability Amongst Colombian Accessions of Purple Passion Fruit, Passiflora edulis f. edulis N. Rodriquez, L. Melgarejo, D. Demissie, and M. Blair*, Tennessee State University (10 minutes)

- Passion fruit class – galupa (purple)
- Edulis has 2 sub-types – f. *flavicarpa* and f. *edulis*
- Colombia is one of main centers of diversification of Passiflora genus – particularly purple (*P. edulis* f. *edulis*)
- Grows wild
- Hillside growing environments
- Eco-physiology study – evaluate 50 landrace and weedy galupa – 50 genotypes chosen from divergent sources, 34 landraces, 8 commercial cultivars, 8 gene bank accessions from National Agriculture Research Institute of Colombia – water status, gas exchange, chlorophyll, stomatic conductance (LICOR) – difference between locations for physiological parameters – some landraces exhibited better water status and gas exchange than commercial – variation between genotype groups
- Seed study – 12 morphological descriptors evaluated in 50 genotypes, commercial cultivars had more seed pits and higher germination compared to landraces or gene accessions – seed pitting observable on both elliptical and oval seeds. More pitting may allow seeds to have better germination rate.
- Genotyping study – genotyping by sequencing – 88 purple *edulis*, 5 yellow *flavicarpa* – 3820 SNPs identified as informative – only 966 SNPs useful for *P. edulis* f *edulis* - need for more SNP discovery – purple commercial had less diversity than landraces – quality scores – genetic tree - pure f. *edulis* distant from f *flavicarpa* in Colombia – population structure – variability for seed size and color traits, adaptation potential measured by photosynthetic evaluations with carotenoids, genome wide association studies
- Maypop (*P. incarnata*) – southeast regional species with potential. Is the TN state flower as voted by school children.

Developing Molecular Breeding Tools for Passion Fruit

Ellen Garcia, PhD Student

Advisors: Dr. Tie Liu, Dr. Alan Chambers

Horticultural Sciences Department

University of Florida

FSHS 2022

1

Introduction

- The Passifloraceae family has over 400 species widely distributed in tropical and subtropical America, Asia, and Africa.
- About 50-60 of these species bear edible fruits and only a few are of commercial importance.
- Commercial production of passion fruit is based on the purple species *Passiflora edulis* and the yellow form *Passiflora edulis flavicarpa* (Amaya, 2012).

2

Nutritional Value

- In its composition can be found numerous bioactive compounds such as **phenolic acids, flavonoids, alkaloids, cyanogenic compounds, glycosides, vitamins, minerals, and terpenoid.**
- Functional properties include **anti-inflammatory, antidiabetic, and antianxiety activities, as well as their capacity to protect against cardiovascular disease** (Martos, 2020).

Table 1: Nutritional composition of passion fruit per 100g.

Nutrients	Nutritional value per 100g	Nutrients	Nutritional value per 100g
Energy	97 kcal	**Thiamine**	0.0 mg
Carbohydrate	23.38 g	**Vitamin A**	1274 IU
Protein	2.20 g	**Vitamin C**	30 mg
Total fat	0.7 g	**Potassium**	348 mg
Cholesterol	0.0 g	**Calcium**	12 mg
Dietary fibre	10.4 g	**Iron**	1.60 mg
Folates	14 µg	**Magnesium**	29 mg
Niacin	1.5 mg	**Phosphorus**	68 mg
Pyridoxine	0.1 mg	**Carotene**	743 µg
Riboflavin g	0.130 mg	**Crypto-xanthene**	41 µ

(**Source:** *USDA National Nutrient Data Base*) [10]

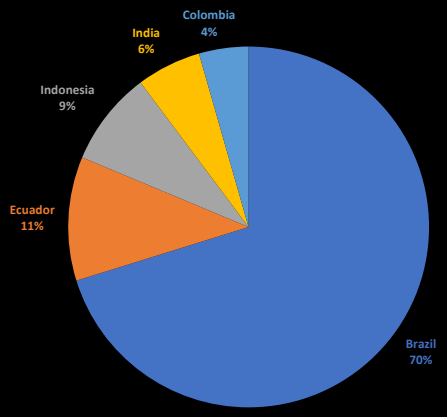
(Thockchom, 2017)

3

Worldwide Production

- Brazil is the largest world producer of passion fruit, with annual production of around 50-60% of the world's production, approximately $248 million (Wijertman, 2016).
- Only Australia, Bermuda, Chile, New Zealand, and Saint Vincent and the Grenadines are approved countries to export fresh passion fruit into the U.S. (USDA-APHIS, 2020).

AVERAGE PASSION FRUIT PRODUCTION WORLD WIDE IN 2014-2017 (TONS)



(Khuwijitjaru, 2020)

4

Economic Value in Florida

- In South Florida the tropical fruit industry is estimated to be worth $73.5 million per year with 1,800 growers on 14,562 acres (Stafne, 2021).

Seasonal Availability

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
California	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Florida	☑	☑			☑	☑	☑	☑				☑
Hawaii	☑					☑	☑	☑	☑	☑	☑	☑
Australia	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Brazil	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Colombia	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
India			☑	☑	☑			☑	☑	☑	☑	☑
Peru	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
South Africa	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑

References: Agricultural Research Council South Africa, Australian Passion Fruit, California Grown, Purdue University College of Agriculture, University of Florida/IFAS Extension, University of Hawaii Cooperative Extension.

5

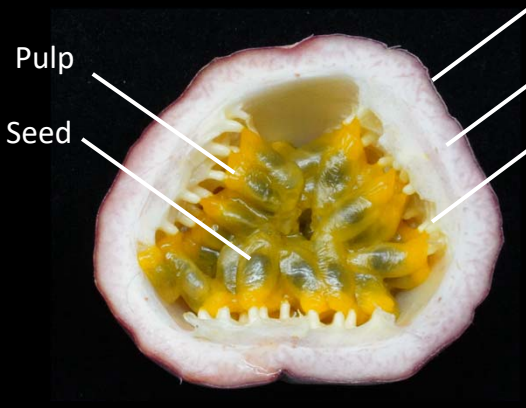
Objectives

The main goal of this research is to:

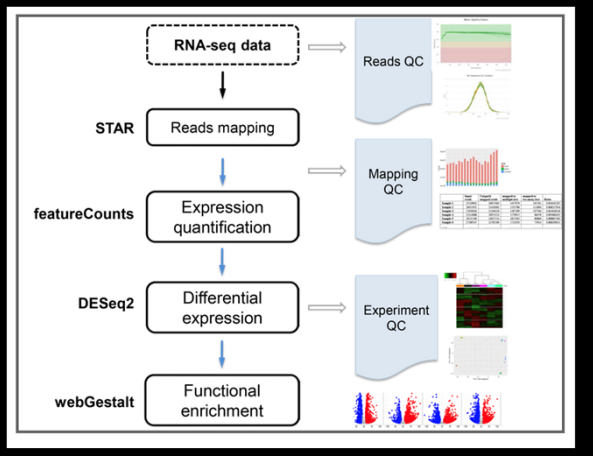
1. Advance the knowledge of the **genetic control of economically important physiological traits** and
2. Leverage this information to develop **molecular tools to enhance breeding efficiency.**

and thus increase fruit productivity and production stability to meet the demand for domestic and international markets.

6



Transcriptomics

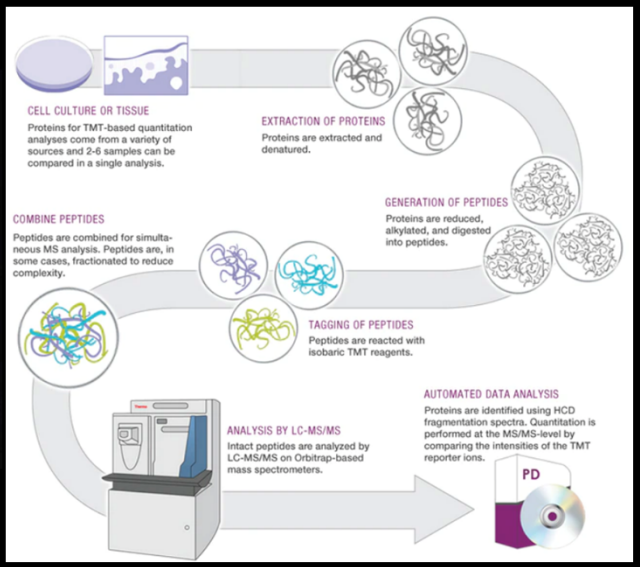


- Identify potential candidate genes for CRISPR-Cas9 construct creation and transformation.
- Gene editing strategies will be employed to develop novel genotypes.

(Vangard, 2021)

7

Proteomics: Tandem Mass Tag (TMT) Analysis

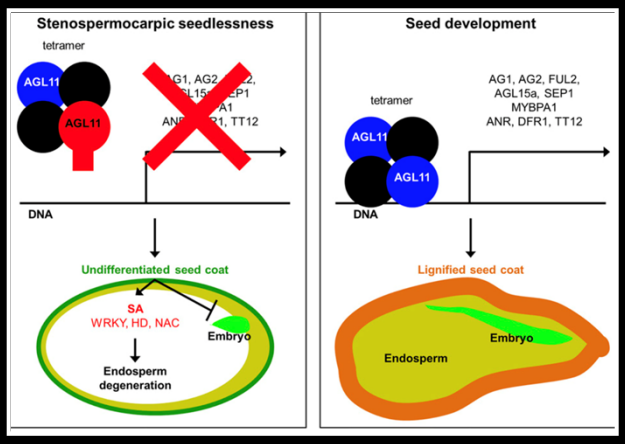


(Maxwell, 2014)

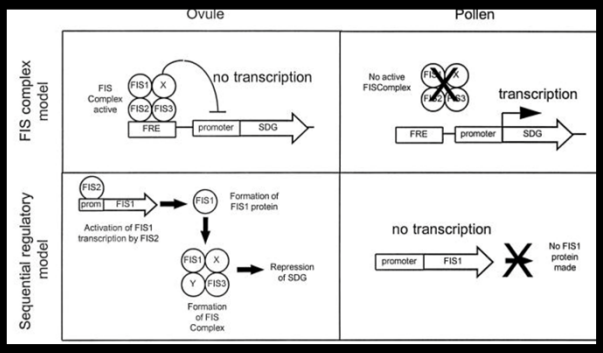
8

Candidate genes for seedless phenotype

Gene	Function
vVAGL11	Morphogenesis regulator gene
FIS2	fertilization-independent seed development
IKU2	protein kinase family



(Royo et al, 2018)

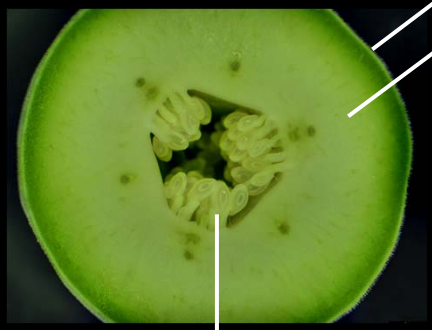


(Luo et al, 1999)

9

Seed Development

- A major breeding objective in many fruit crops is the reduction of seed content to enhance the ease of fruit eating as well as improve the suitability of fruits for the food processing industry.
- Seed-specific genes will be validated using tissue-specific RNA sequencing and qRT-PCR.



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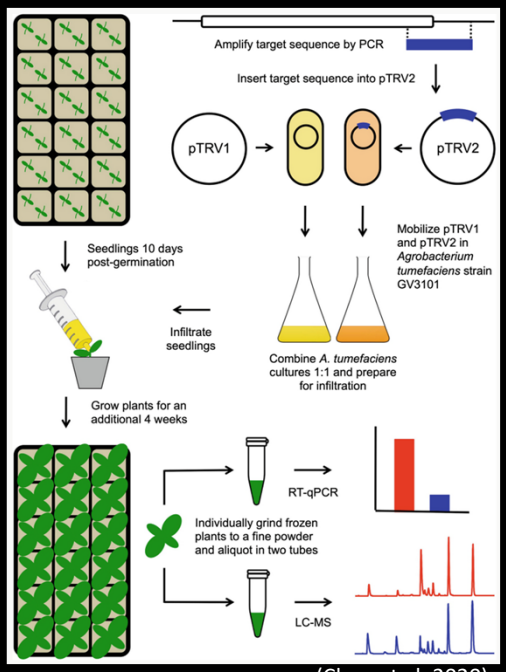

(Chen et al, 2020)

Virus Induced Gene Silencing (VIGS)

- Genetics tool for high throughput analysis of the **biological function of target genes in plants.**
- Rapidly degrades target mRNA with rapid results.
- Phytoene desaturase (PDS) is typically used as a marker resulting in visible leaf photo-bleaching.
- Gene silencing via agro-injection of the leaves.

11

Ongoing research

The project will utilize a multidisciplinary sciences researching:

- Genomic
- Transcriptomic
- Proteomic data

to better understand the genetic basis and biological mechanisms of agronomically important traits such as seed development and senescence in passion fruit.

12


Thank you
USDA
NIFA
United States Department of Agriculture
National Institute of Food and Agriculture
UF IFAS
UNIVERSITY of FLORIDA
TREC
Tropical Research and
Education Center
UF IFAS
UNIVERSITY of FLORIDA
HORTICULTURAL SCIENCES

13

Establishing Gene Editing Technology to Generate Seedless Passion Fruit, E. Garcia, A. Chambers, and T. Liu, University of Florida (10 minutes)

- Over 600 species in genus – tropical and subtropical
- Nutritional value – phenolics, flavonoids, alkaloids
- Brazil is largest producer
- Only certain countries approved to export to us
- Objectives – knowledge of genetic control, develop molecular tools
- Transcriptomics – id potential candidate genes for crispr, gene editing strategies will be employed to develop novel genotypes
- Proteomics – tandem mass tag (TMT) analysis – extract protein – isolate – precipitate – what proteins are being produced to determine physiological traits
- Candidate genes for seedless phenotype – looking at seedlessness in grapes, looking at Arabidopsis as well
- Seed development
- Virus-induced gene silencing – analysis of biological function of target genes in plants, rapidly degrades target mRNA with rapid results, gene silencing via agrobacterium injection in leaves
- To better understand the genetic basis and biological mechanisms
- Genome annotation?

Tools to analyze your enterprise's profitability

Trent Blare

Victor Contreras

Fredy Ballen

UF/IFAS Tropical Research & Education Center

Passion Fruit & Dragon Fruit

June 14, 2022

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OBJECTIVES

- **Present results for an enterprise budget for passion fruit (i.e. cost and returns from one acre)**
  - Interviews with a few growers in Miami-Dade County
  - Additional data production collected from TREC
  - Price data from interviews with input suppliers
- **Discuss the profitability of passion fruit in South Florida**

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REVENUE

	Quantity (pounds)	Value per acre ($/acre/year)	Value per pound ($/pound)
Marketable yield(Pounds/Acre)	2,800		
Field run price			5
total revenue		14,000	

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3

PRODUCTION COST

Item	Value per acre ($/acre/year)	Value per pound ($/pound)
Irrigation	185	
Fertilizer	3,359	
Herbicide	550	
Insecticide	778	
Fungicide	1,007	
Pollinate	900	
Pruning and Other Misc. Labor Expenses	1,514	
Interest on Production Capital(5 %)	415	
Total Production Cost	8,708	3.11

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4

FIXED COST

Item	Value per acre ($/acre/year)	Value per pound ($/pound)
Cash Overhead		
Insurance	100	
Taxes	100	
Non- Cash Overhead		
Land Rent	500	
Other Overhead	950	
Total Fixed Cost	1,650	0.59
TOTAL PRE-HARVEST COST	10,358	3.70

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5

OVERVIEW

Item	Value per acre ($/acre/year)	Value per pound ($/pound)
Total revenue	14,000	
TOTAL PRE-HARVEST COST	10,082	3.60
Total harvest and market cost	1,080	0.39
TOTAL COST	11,438	4.09
GROSS MARGIN	4,212	1.50
ESTIMATED NET RETURNS	**2,562**	**0.92**

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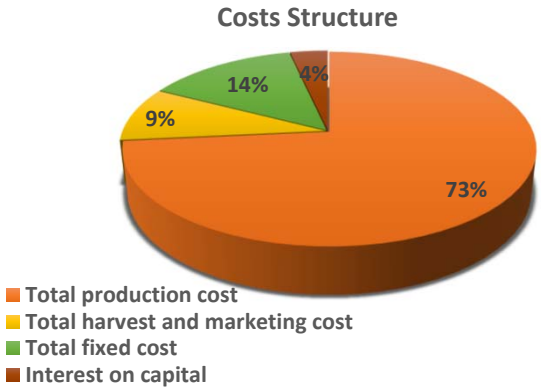
6

Cost Structure

Total production cost	8,708
Total harvest and marketing cost	1,080
Total fixed cost	1,650
Interest on capital	415



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7

Sensitivity Analysis of Net return

Yield (pounds/acre)	Wholesale Price (dollars/pound)				
	4.50	4.75	**5.00**	5.25	5.50
	(–10%)	(–5%)	**(base)**	(+5%)	(+10%)
2,520(–10%)	-98	532	1,162	1,792	2,422
2,660(–5%)	532	1,197	1,862	2,527	3,192
2,800(base)	1,162	1,862	2,562	3,262	3,962
2,940(+5%)	1,792	2,527	3,262	3,997	4,732
3,080(+10%)	2,422	3,192	3,962	4,732	5,502

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8

TAKE AWAYS

- Passion fruit in South Florida seems to be profitable
- Main costs: fertilizer, labor, and fungicides
- Total labor high if you include hand pollination
- Fertilizer & other inputs going up rapidly – **be careful**
- Welcome feedback for more realistic budget

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THANK YOU

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- **Research Assistant Agricultural Economics**
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Tools to analyze your passion fruit enterprise's profitability, V. Contreras, University of Florida (10 minutes)

- Present results for an enterprise budget for passionfruit (costs and returns from one acre) – interviews with growers, data collection from TREC, price data
- Look at revenue, marketable yield, field run place, production costs (irrigation, fertilizer, pesticides, pollinating, pruning), fixed cost (cash overhead, insurance, taxes, non-cash overhead, land rent)
- Overview (revenue, preharvest cost, harvest, and market cost)
- 73% cost from production costs
- Analysis of net return
- Passion fruit seems to be profitable, main costs: fertilizer, labor, fungicides – total labor high if you hand pollinate – fertilizer and other inputs going up rapidly

How to Market in Digital Era

Trent Blare
Assistant Professor in Food & Resource Economics
UF/IFAS Tropical Research & Education Center
Multi-State Passion Fruit Conference
June 15, 2022

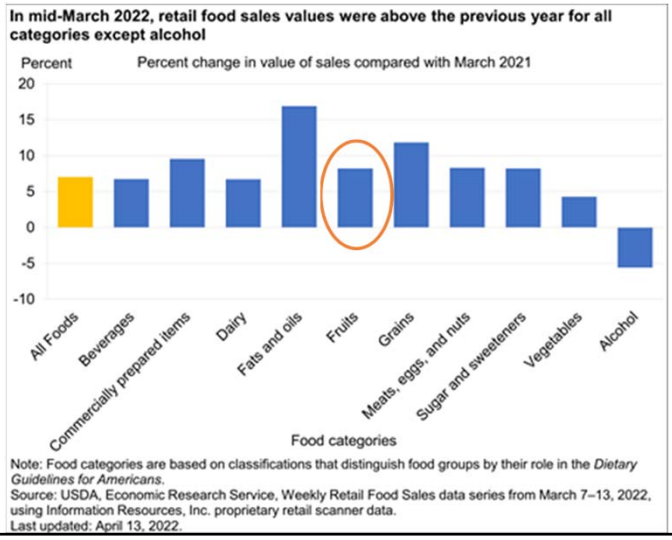
1

Importance of marketing

- Consumers must be aware of your product
- Desire for local & direct purchases
  - Farmers' markets increased by 180% from 2007-14
  - Local ag products sales increased by 28% from 2015-17, 3% of all ag sales
- Purchasing habits from pandemic are likely to stick
  - Online purchases & delivery
  - Demand for healthy foods (i.e. fruits)

2

New Reality in Agricultural Marketing



3

How to confront this new reality?

- Don't put all your eggs in one basket
  - Diversify crops & other ag activities
  - Diversify marketing strategies
  - Diversify sales outlets
- Develop a marketing plan that may includes digital tools

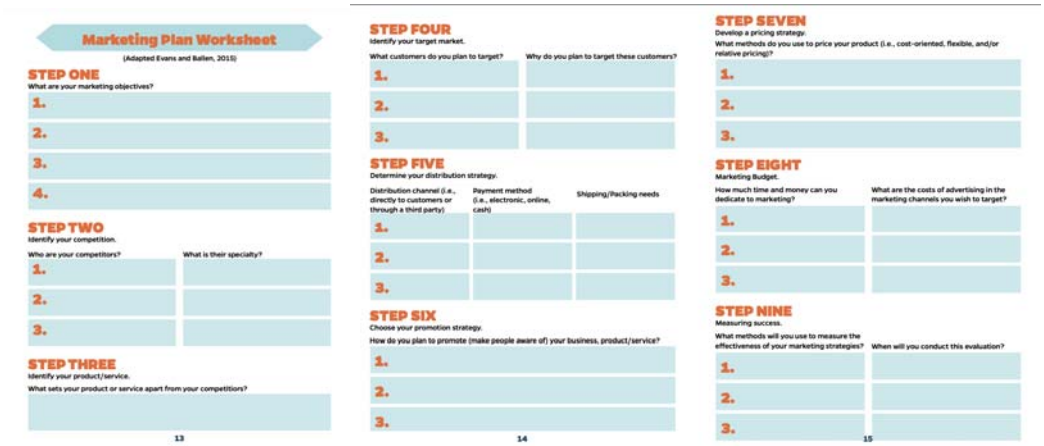
4

Nine steps in making a marketing plan

1. Set clear objectives
2. Identify your competition
3. Determine what sets you apart
4. Identify target market
5. Determine distribution strategy
6. Choose your promotion strategy
7. Develop a pricing strategy
8. Make a marketing budget
9. Measure your success

5

Helpful worksheet in our manual



Marketing Plan Worksheet

(Adapted Evans and Ballen, 2015)

STEP ONE
What are your marketing objectives?
1.
2.
3.
4.

STEP TWO
Identify your competition.

Who are your competitors?	What is their specialty?
1.	
2.	
3.	

STEP THREE
Identify your product/service.
What sets your product or service apart from your competitors?

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STEP FOUR
Identify your target market.

What customers do you plan to target?	Why do you plan to target these customers?
1.	
2.	
3.	

STEP FIVE
Determine your distribution strategy.

Distribution channel (i.e., directly to customers or through a third party)	Payment method (i.e., electronic, online, cash)	Shipping/Packing needs
1.		
2.		
3.		

STEP SIX
Choose your promotion strategy.
How do you plan to promote (make people aware of) your business, product/service?
1.
2.
3.

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STEP SEVEN
Develop a pricing strategy.
What methods do you use to price your product (i.e., cost-oriented, flexible, and/or relative pricing)?
1.
2.
3.

STEP EIGHT
Marketing Budget.

How much time and money can you dedicate to marketing?	What are the costs of advertising in the marketing channels you wish to target?
1.	
2.	
3.	

STEP NINE
Measuring success.

What methods will you use to measure the effectiveness of your marketing strategies?	When will you conduct this evaluation?
1.	
2.	
3.	

15

6

Additional Resources

- https://ruralengagement.org/digital-marketing-toolkit/
  - Recordings of bilingual trainings for creating a marketing plan, using social media, making electronic sales, making SNAP sales, & examples of success
  - Bilingual marketing manual & worksheet
- Ask IFAS https://edis.ifas.ufl.edu/ resources on conducting marketing research & some consumer studies for various products
- USDA's Marketing Service's Market News has pricing data for many fruits at major terminals in the US https://www.ams.usda.gov/market-news
- Enterprise budgets for various Florida Crops https://fred.ifas.ufl.edu/extension/commodityenterprise-budgets/

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Feel free to reach out

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How to market in a digital era, T. Blare, University of Florida (10 minutes)

- Importance of marketing – consumers must be aware of your product – desire for local and direct purchases – purchasing habits from pandemic are likely to stick (online, delivery, demand for healthy foods)
- Diversify crops and other ag activities, marketing strategies, sales outlets, develop marketing plan
- 9 steps in making a marketing plan
- Resources on making a plan, how to conduct marketing research, enterprise budget

GROWING THE US PASSIONFRUIT INDUSTRY: STRATEGIC CONFERENCE

PROMOTING THE SUSTAINABILITY OF THE PASSIONFRUIT INDUSTRY IN AUSTRALIA

PASSIONFRUIT AUS INC.

1

GROWING THE US PASSIONFRUIT INDUSTRY: STRATEGIC CONFERENCE

PROMOTING THE SUSTAINABILITY OF THE PASSIONFRUIT INDUSTRY IN AUSTRALIA
-THE AUSTRALIAN CONTEXT

- **Key stakeholders**
  - Growers
  - Transporters
  - Selling Agents
  - Retailers
  - Horticulture Innovation Australia
  - Plant Health Australia
  - Australian Pesticides and Veterinary Medicines Authority
  - QA Certifiers
  - Suppliers and Service Providers

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GROWING THE US PASSIONFRUIT INDUSTRY: STRATEGIC CONFERENCE

PROMOTING THE SUSTAINABILITY OF THE PASSIONFRUIT INDUSTRY IN AUSTRALIA
PAI MEMBER SERVICES

Industry Representation

- Monitor Levy Expenditure
  - Research and Development
  - Marketing
- National Biosecurity Responsibilities
- Grower Organisations Liaison
- Government Policy Review
- Market Access
- Chemical Permits

Grower Support

- Communications
  - Monthly Newsletter
  - Quarterly Magazine
  - Field Days
  - Website
- Tools
  - Passionfruit Growing Guide
  - Problem Solver Field
  - Grading Guide
  - Online Growers Forum

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GROWING THE US PASSIONFRUIT INDUSTRY: STRATEGIC CONFERENCE

PROMOTING THE SUSTAINABILITY OF THE PASSIONFRUIT INDUSTRY IN AUSTRALIA
PAI MEMBER SERVICES

PASSIONFRUIT AUS INC.

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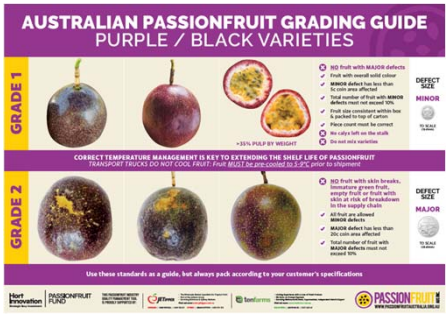
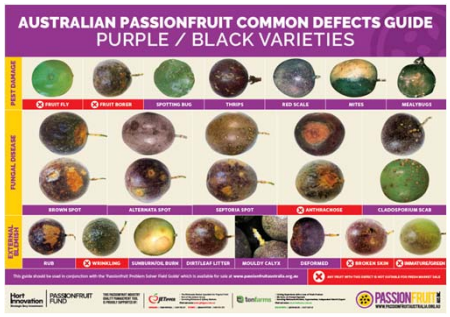
GROWING THE US PASSIONFRUIT INDUSTRY: STRATEGIC CONFERENCE

PROMOTING THE SUSTAINABILITY OF THE PASSIONFRUIT INDUSTRY IN AUSTRALIA
PAI MEMBER SERVICES





PASSIONFRUIT AUS INC.

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Promoting the Sustainability of the Passionfruit Industry in Australia, D. Chant, Passion Fruit Australian Inc. (15 minutes, virtual)

- One of smallest horticultural industries in Australia
- Import of frozen and candied – not fresh
- Most product sold via retail
- Strong on buyer security – plant health
- Not allowed to use chemicals not approved by Australian Pesticides and Veterinary Medicines Authority
- Represent industry's interest – import, competition, obtaining permits, research and development, marketing
- Field days to promote IPM
- Passion fruit growing guide, pocketbook field guide
- More purple varieties where he's located – more yellow in more tropical areas
- Biggest barrier for organization of group? Strong history of grower organizations – growers are time poor, no field days during COVID
- Any special commercial hybrid varieties – a lot of levy fund going towards breeding programs

Short, End of Conference Evaluation


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