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Growing the Cannabis Research Spectrum

Hope Jones, PhD
CEO
Superior Phenos & ECS

“Only 42% of Cannabis Businesses are Turning a Profit...”

Yaël Bizouati Kennedy,
GoBankingRates & Yahoo News

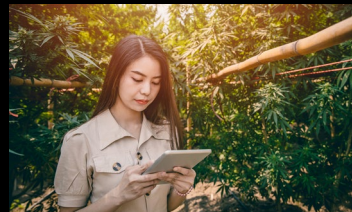
TWO Problems

DISEASE



(virus & viroid)

DIVERSITY



(owners, managers,
& workers)

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PROBLEM ONE



PROBLEM
ONE



CULTIVATION



Epigenetic Associated Decline



Pests & Disease

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Dark Heart Data Shows Hop Latent Viroid Drives \$4B Annual Losses to Legal Cannabis Crop

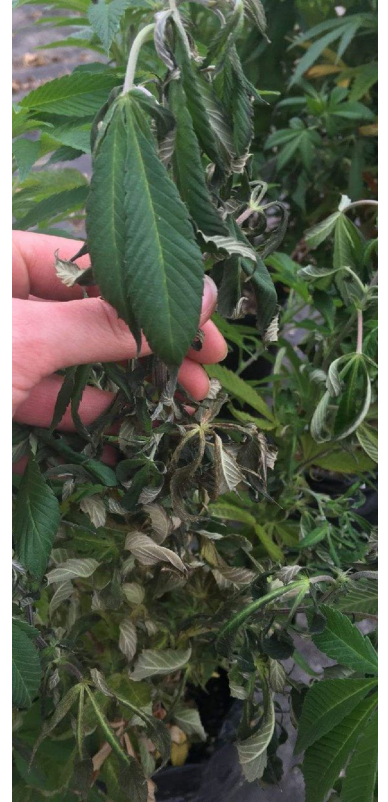
DAVIS, Calif., Aug. 16, 2021 (GLOBE NEWSWIRE) -- Dark Heart Industries, California's leading cannabis genetics company, has completed 200,000 tissue tests for Hop Latent Viroid (HpLVd) and uncovered startling new statistics about the impact of the disease on America's legal cannabis industry.

Dark Heart performed tests for more than 100 cannabis growers across California from August 2018 until July 2021. Results show that more than 33% of the tests from almost 90% of the cultivation sites were positive for HpLVd and supports projections by cannabis industry analysts that Hop Latent Viroid affects more than 30% of all cannabis plants. This translates into more than \$4 billion in annual losses for US growers who are forecast to produce more than seven million pounds of legal cannabis in 2021*.

<https://www.globenewswire.com/news-release/2021/08/16/2281335/0/en/Dark-Heart-Data-Shows-Hop-Latent-Viroid-Drives-4B-Annual-Losses-to-Legal-Cannabis-Crop.html>

THE CHALLENGES

- Botrytis
- Fusarium
- Pseudomonas
- Crown gall
- Pythium
- Virus
- Viroids



Once you
planted that
seed:

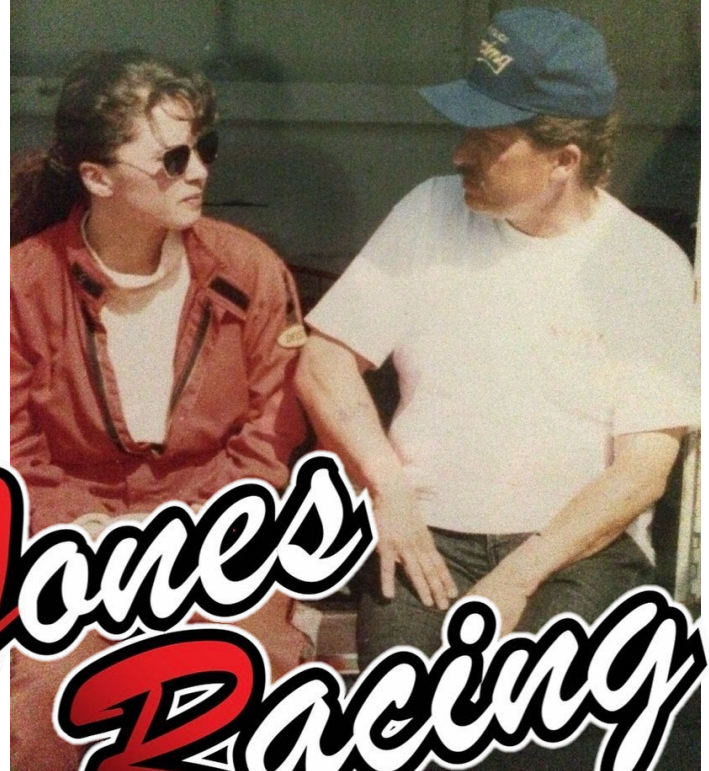
You can't
mitigate



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IMPACT - Links to
costs, research quality
and barrier to
innovation





Cannabis is not alone

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What is Plant Tissue Culture?

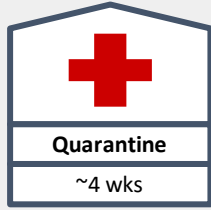
- “**Plant tissue culture** is a collection of techniques used to maintain or grow plant **cells, tissues or organs** under sterile conditions on a nutrient culture medium...
- ...widely used to produce clones of a plant in a method known as **micropropagation.**”



WIKIPEDIA
The Free Encyclopedia



INTAKE



Pathogen &
Virus
Indexing

Tissue Culture
[Various methods for Clean-up]

Somaclonal Variation?
Molecular analysis &
R&D

HARDENED
CLONES



Call To Action!

If TC is available:

- Ask for disease testing COAs
- Ask & look at their stock
- Know how to **KEEP** it clean

If TC NOT available

- Start in-house program

Regardless, implement strict quarantine process!

Call To Action!

Hop Research Council

The Hop Research Council is a non-profit organization that funds and directs hop research to benefit the U.S. hop industry. Members include domestic and international brewers, hop dealers, and hop grower organizations.

The Council was established in 1979 by a group of hop industry members that believed in the benefit of a united hop research effort. Today, the original goal remains true. Brewers, Dealers, and Growers work together to fund and direct hop research, ensuring a bright future for the U.S. hop industry.



Research

The Hop Research Council's primary objective is to fund hop research. For 2021, the HRC funded 13 research projects that meet the research goals of our diverse membership. For a complete list of the projects funded in 2021, please see the attachment below.

We are currently accepting research proposals for funding during the 2022 calendar year. Attached below is our Request For Proposal 2022 for researchers to review and use to request research funding. The RFP is due on June 21, 2021. Also attached below is our list of research priorities for you to use when considering a research project of importance to the HRC.



Powdery Mildew in Oregon Hops



PROBLEM TWO

**“Only 42% of Cannabis Businesses are
Turning a Profit...”**

Yaël Bizouati Kennedy,
GoBankingRates & Yahoo News

PROBLEM TWO

**“Only 42% of Cannabis Businesses are
Turning a Profit - **Women and Minorities
Fare the Worst**”**

Yaël Bizouati Kennedy,
GoBankingRates & Yahoo News

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PROBLEM
TWO





**WHY is
DIVERSITY
IMPORTANT?**

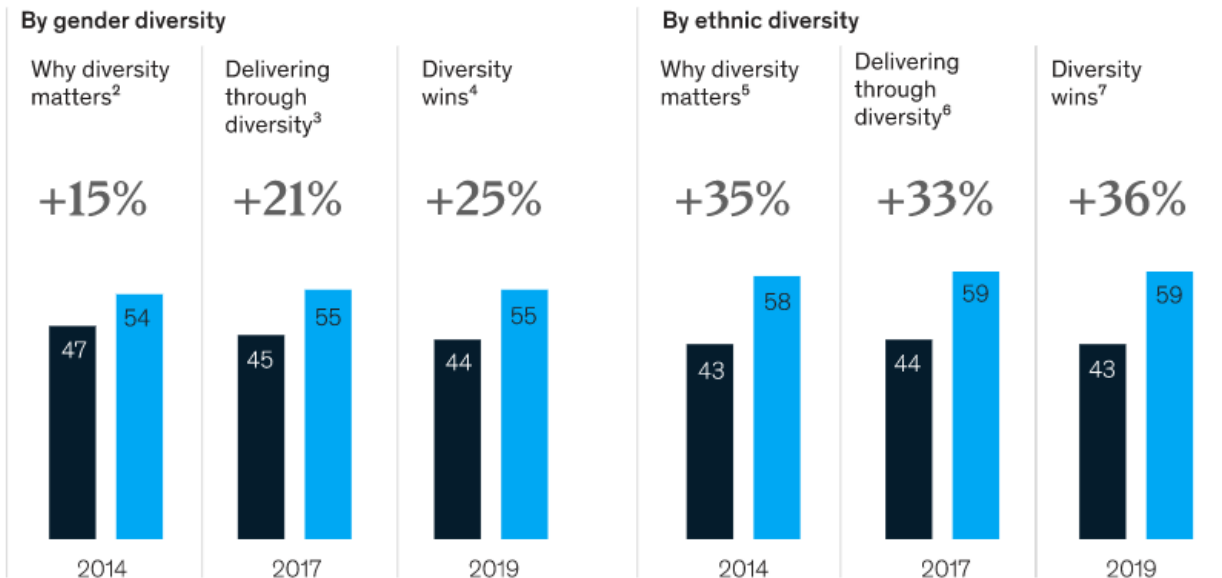
The “Business Case”

Companies in the top-quartile for gender diversity on their executive teams were **21% more likely to have above-average profitability** than companies in the fourth quartile. For ethnic/cultural diversity, top-quartile companies were **33% more likely to outperform on profitability.**

The business case for diversity in executive teams remains strong.

Likelihood of financial outperformance,¹ %

■ Bottom quartile ■ Top quartile



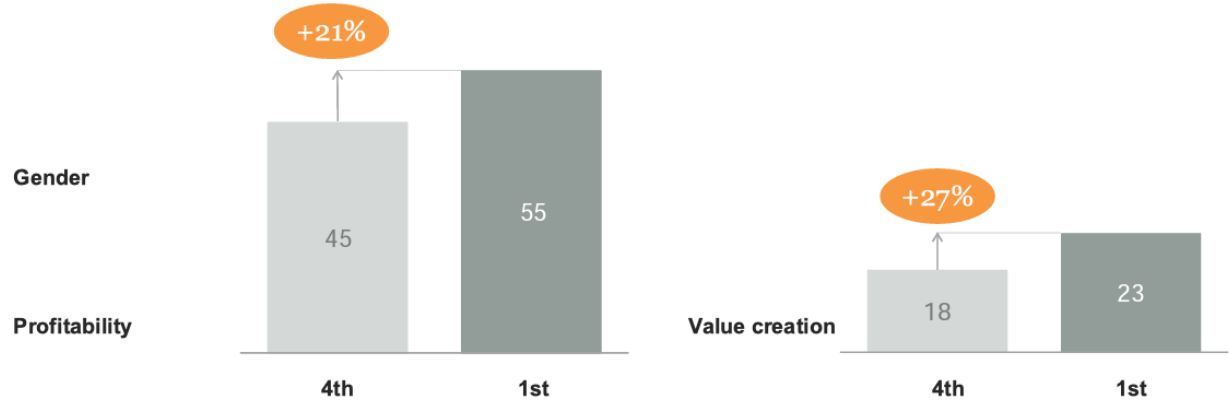
¹Likelihood of financial outperformance vs the national industry median; p-value <0.05, except 2014 data where p-value <0.1. ²n = 383; Latin America, UK, and US; earnings before interest and taxes (EBIT) margin 2010–13. ³n = 991; Australia, Brazil, France, Germany, India, Japan, Mexico, Nigeria, Singapore, South Africa, UK, and US; EBIT margin 2011–15. ⁴n = 1,039; 2017 companies for which gender data available in 2019, plus Denmark, Norway, and Sweden; EBIT margin 2014–18. ⁵n = 364; Latin America, UK, and US; EBIT margin 2010–13. ⁶n = 589; Brazil, Mexico, Singapore, South Africa, UK, and US; EBIT margin 2011–15. ⁷n = 533; Brazil, Mexico, Nigeria, Singapore, South Africa, UK, and US, where ethnicity data available in 2019; EBIT margin 2014–18.
Source: Diversity Wins data set

Companies in the top-quartile for gender diversity on executive teams were 21% more likely to outperform their national industry median on EBIT margin and 27% on EP margin.

How gender diversity correlates with financial performance

Likelihood of financial performance¹ above national industry median by diversity quartile
Percent

Executive team
N = 991



¹ Average economic profit margin 2011–15 and average EBIT margin 2011–15

NOTE: Results are statistically significant at p-value <0.5. Percentages shown here are rounded to the nearest whole number; however, calculation of the differentials in quartile performance uses actual decimal values

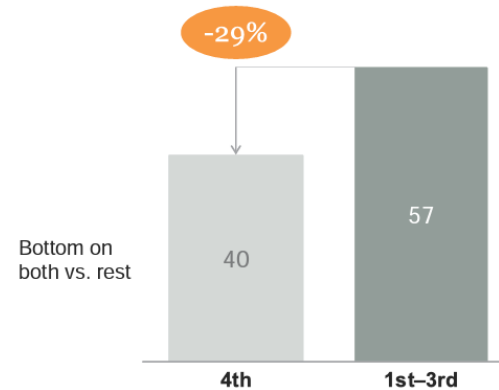
How low gender and ethnic diversity correlate to poorer financial performance

Likelihood of financial performance¹ above national industry median by diversity quartile
Percent

Executive team
N = 589

Gender and ethnic/cultural²

Profitability



¹ Average economic profit margin 2011–15 and average EBIT margin 2011–15

² Executive gender diversity analyzed for 991 companies in all regions. For 589 companies with gender and ethnic/cultural diversity data, in all regions except Australia, France, Germany, India, Japan, and Nigeria

NOTE: Percentages shown here are rounded to the nearest whole number; however, calculation of the differentials in quartile performance uses actual decimal values

Diversity leaders bring fresh perspectives on how to build an effective strategy by drawing on the stories of leading global companies.



McKinsey&Company

“Today’s executives have demonstrated to the wider business community that female leaders have the skills and foresight to make strategic decisions that benefit their companies and local communities. Their abilities to exceed industry expectations underscores how much farther the industry can go if more talented women enter the fold.”

Rolling Stone, 2021

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Rolling Stone, 2021

“No shit!”

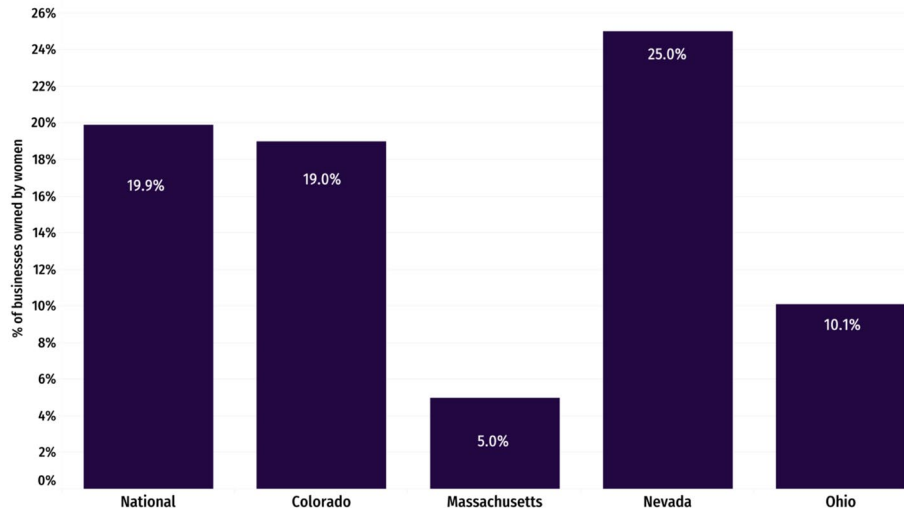
Hope Jones, Today 2:55pm

The Uncommon Sense Case

A recent Harvard internal study showed just that: 43% of white students were admitted because of legacy or donations, **but only 26% of them would have made the cut based on grades or other indicators of merit.**

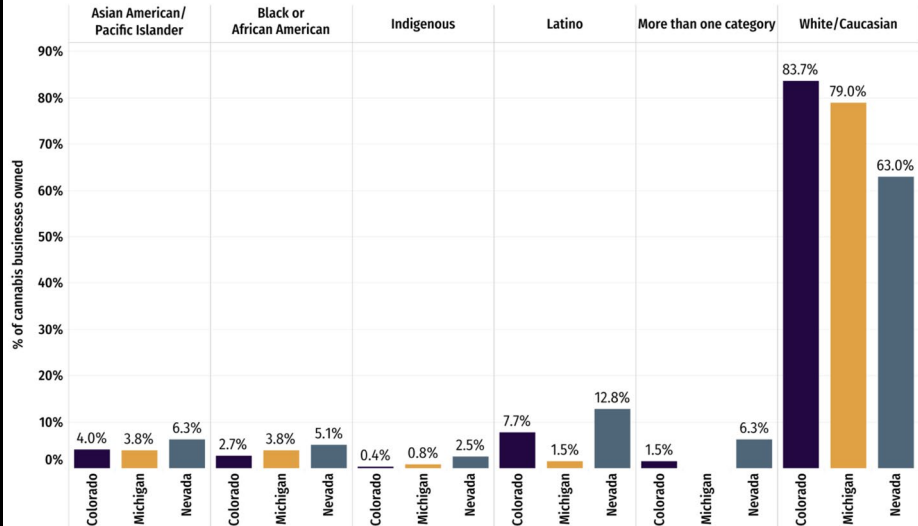
On the other hand, research on quotas shows that such targets tend to **increase quality** by giving highly qualified women and people of color a chance **and eliminating the unfair advantages** that the less qualified straight white men have had.

Cannabis Businesses Owned by Women in Select States



Source: Colorado Marijuana Enforcement Division, Massachusetts Cannabis Control Commission, Nevada Cannabis Compliance Board, Ohio Medical Marijuana Control Program and U.S. Bureau of Labor Statistics Current Population Survey
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Cannabis Businesses Owned by Minorities in Select States



Source: Colorado Marijuana Enforcement Division, Michigan Marijuana Regulatory Agency, Nevada Cannabis Compliance Board and U.S. Bureau of Labor Statistics Current Population Survey
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If woman & minorities do find \$, they often receive less funding and fewer resources - such as mentorship and strategic guidance.

What do you think is the biggest challenge to increasing diversity in the cannabis industry?



LICENSE CAPS

HURTING THOSE WE ARE MAKING THE CASE FOR



FOR IMMEDIATE RELEASE

February 9, 2022

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**Minority Cannabis Business Association to Unveil National Cannabis
Equity Report and Digital Research Map**

Washington, D.C. – On February 10th, 2022, the Minority Cannabis Business Association (MCBA) will take the first step on a journey to usher in a new era of social equity with the release the National Cannabis Equity Report and Equity Map with support from The Arcview Group, and in association with Weedmaps and Parallel.

1. The number and efficacy of state social equity programs does not reflect the expressed commitment to achieving equity through cannabis.
2. The use of non-race criteria in the social equity qualifications and definitions has not yielded diverse cannabis markets.
3. Despite evidence to support cited concerns, many states continue to utilize state-level license caps to limit state markets leading to a lack of diversity and the proliferation of the legacy market.
4. Among the few social equity programs that provide funding, fewer still provide access to timely funding for social equity applicants and licensees.
5. Requirements to secure premises prior to issuance of a license or conditional license continue to present a significant barrier to entry for social equity operators.
6. Bans on ownership for individuals with past cannabis convictions remains prevalent in state-legal cannabis programs.
7. Inequities in existing medical markets create inequities in adult use markets.

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Thanks to my crew:

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Vicki Buckman

Sonoran Roots



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