GRAND RAPIDS 2030 DISTRICT

CANNABIS

WEBINAR SERIES

COMPARING HPS TO LED SIDE-BY-SIDE IN MICHIGAN INDOOR GROW: WHY LED WON

Scott Asiala | Fluresh
Brady Nemeth | Fluence Bioengineering
Rachel Fredrickson | Consumers Energy

INTRODUCTIONS

Moderator:
Gillian Giem, Program Manager,
Grand Rapids 2030 District

Speakers:
Scott Asiala, Vice President of Cultivation & Extraction, Fluresh

Brady Nemeth, Utility Rebate Coordinator, Fluence Bioenengineering

Rachel Fredrickson, Indoor Agriculture Specialist, Consumers Energy

GRAND RAPIDS 2030 DISTRICT®

FLURESH™

FLUENCE BIOENGINEERING

Consumers Energy Count on Us®

IT'S HERE!

GRAND RAPIDS CANNABIS ENERGY MANAGEMENT

BEST PRACTICES GUIDE

BRADY NEMETH

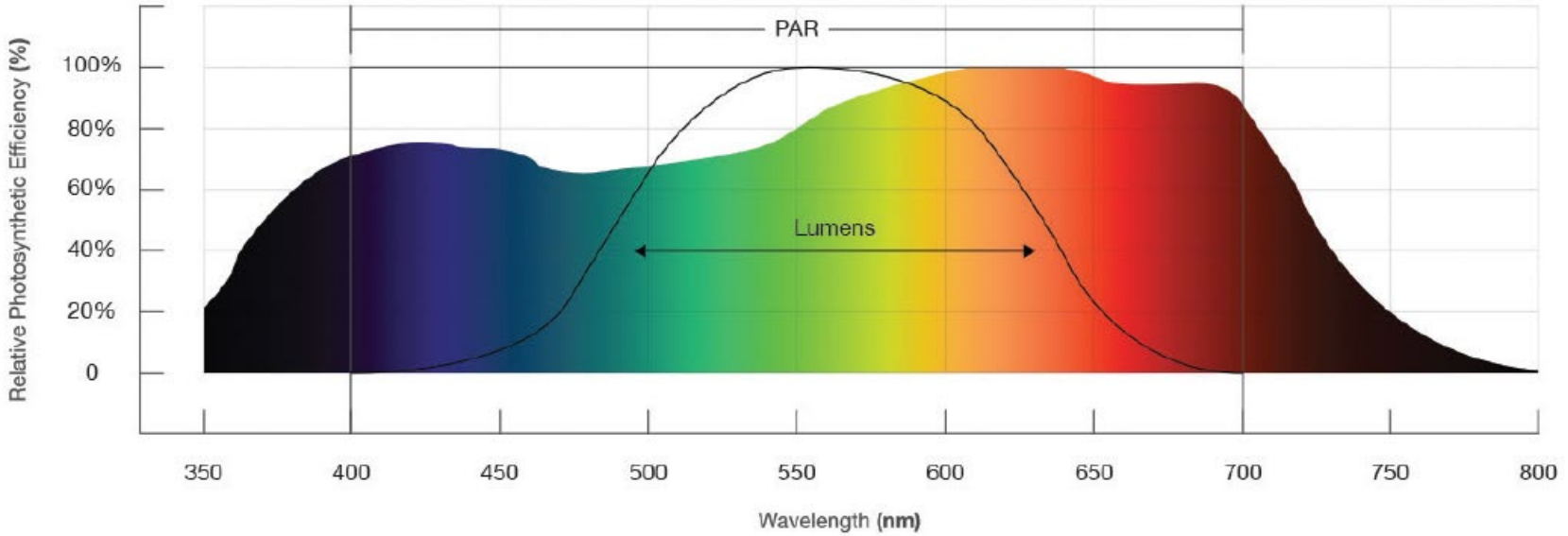
Utility Rebate Coordinator

HOW TO EVALUATE HORTICULTURE LIGHTING

Speaking the Same Language

PHOTOSYNTHETICALLY ACTIVE RADIATION

The **range** of light that drives photosynthesis. It ranges from 400 to 700 nanometers on the electromagnetic spectrum. While light outside of this range (i.e. UV and Far Red) is conducive for other photobiological activity such as development and photoperiod, PAR is primarily responsible for plant growth/yield.



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HOW TO EVALUATE HORTICULTURE LIGHTING

Speaking the Same Language

There are numerous variables that factor into the overall performance of a horticulture lighting solution, and thus the overall performance of a controlled environment horticulture facility. Understanding these factors and their impact will ensure a more educated purchase decision to achieve your goals.

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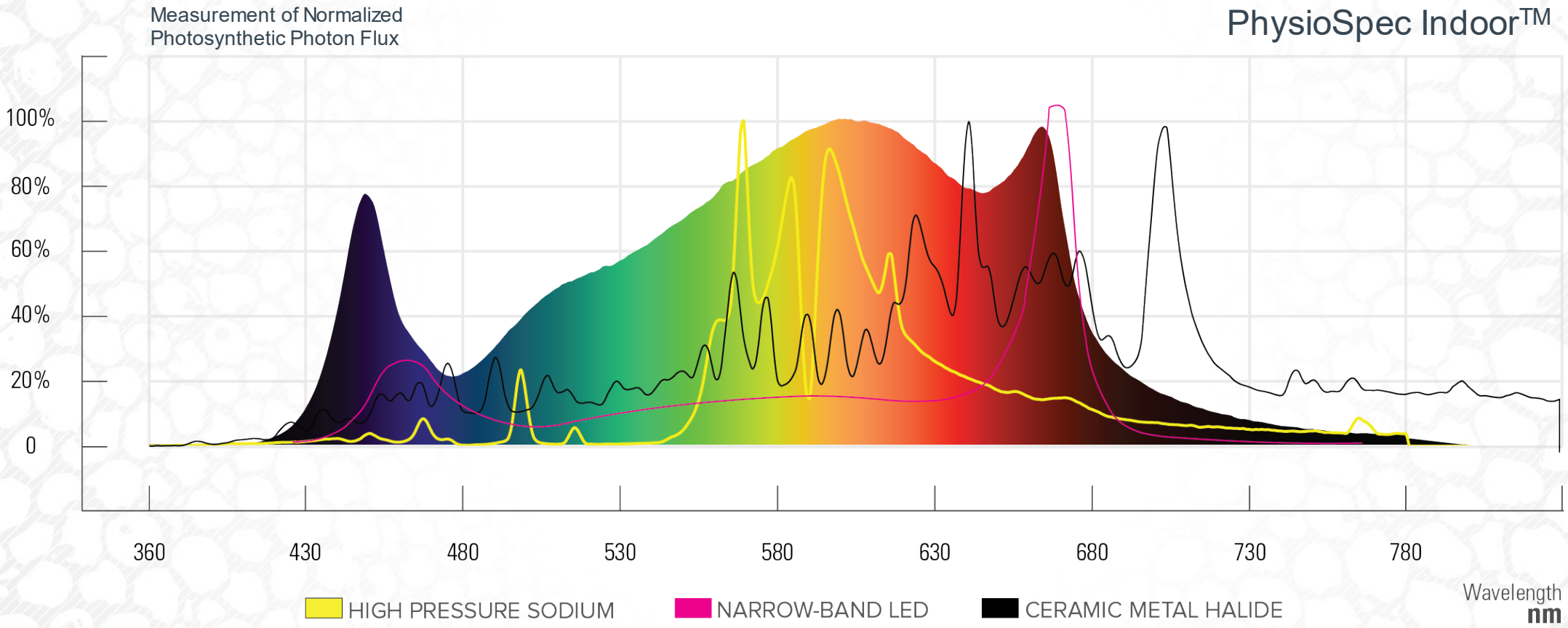
EVIDENCE-BASED Design

Legacy Lighting Technology Vs PhysioSpec Indoor™



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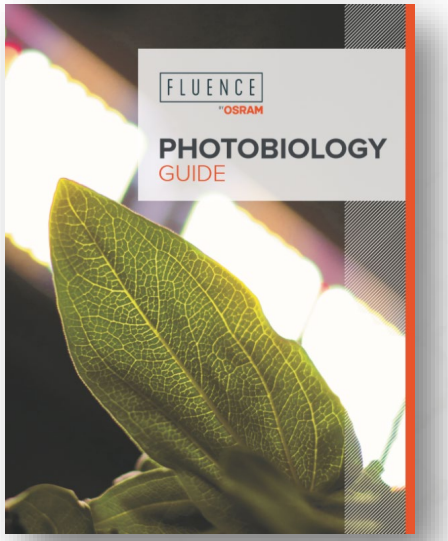
Fluence Resources

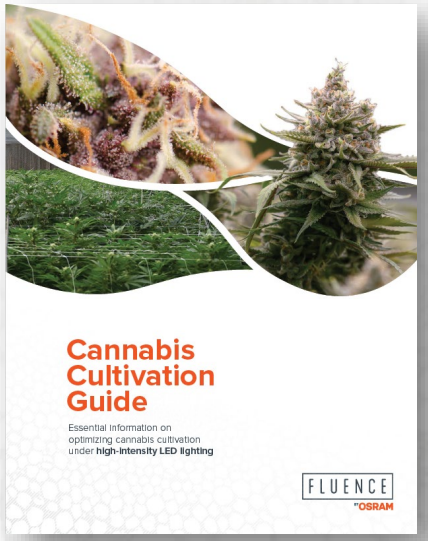
Photobiology Guide

https://fluence.science/guides/photobiology-guide/

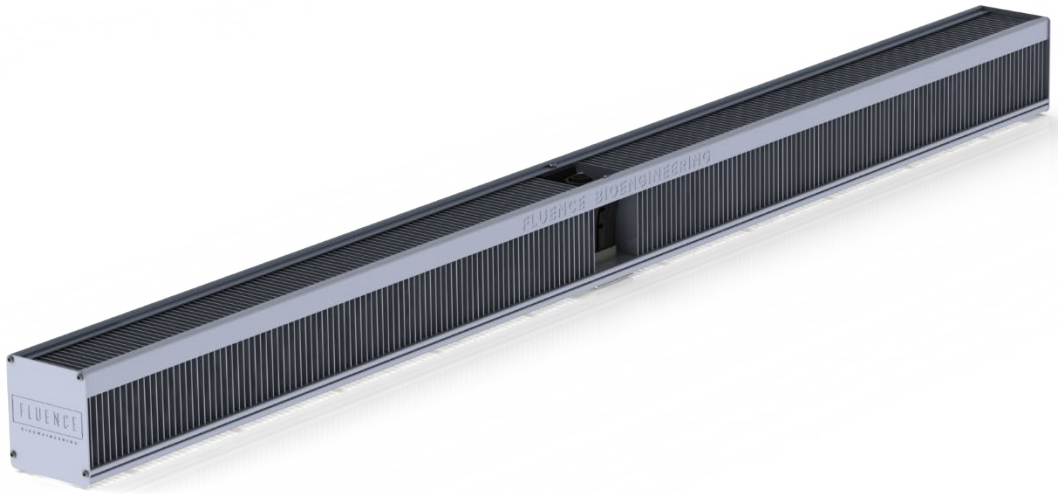
Cultivation Guide

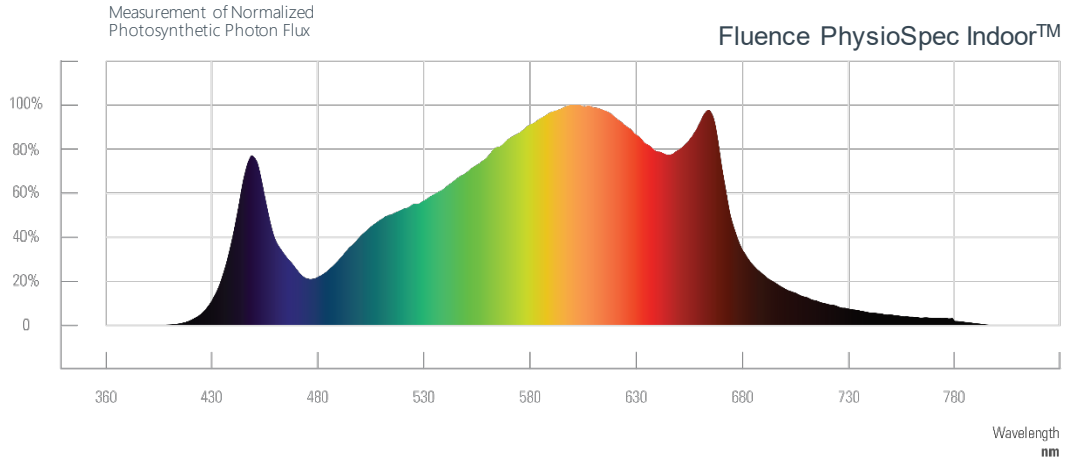
https://fluence.science/guides/cannabis-cultivation-guide/



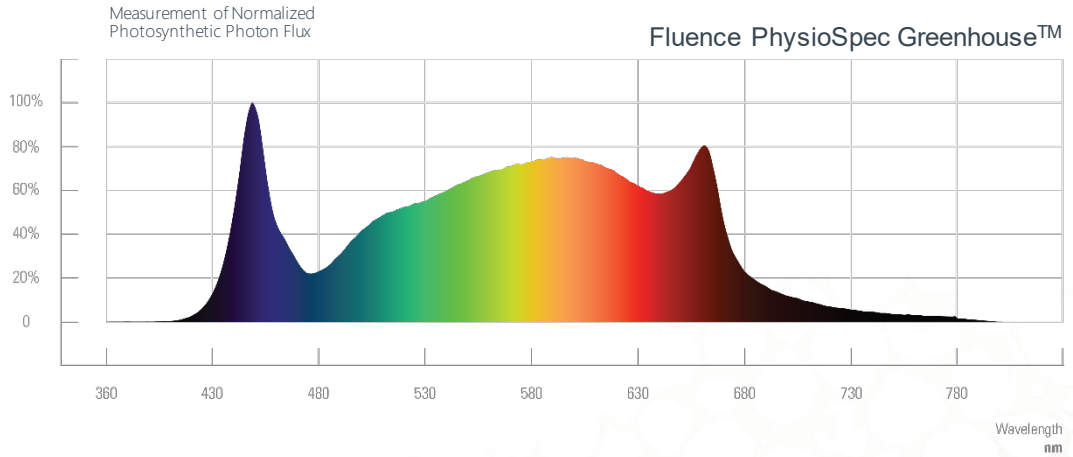


VYPR 2p Powerful | Efficient | Shadow-free



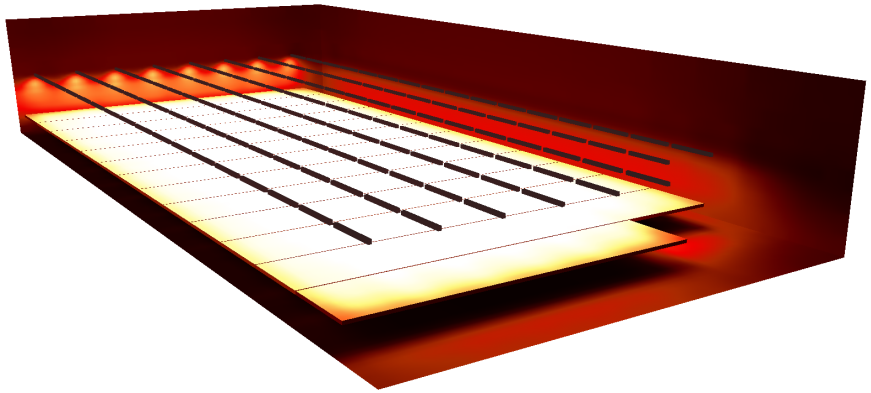


VYPR 2p SPECIFICATIONS	
PPF	1700 µmol/s
Input Power	631W
Efficacy	2.7 µmol/j
Input Voltage	Autosensing 100-277V, 347V, 400V & 480V



Flower Room 123

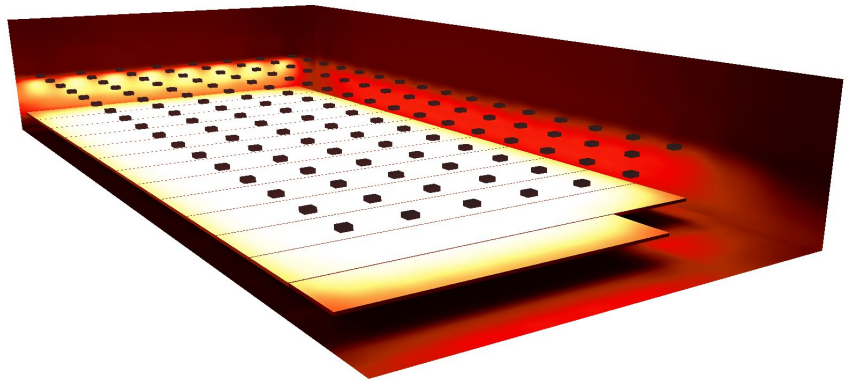
VYPR 2p



PPFD units: µmol/m²/s)	
	900.00
	787.50
	675.00
	562.50
	450.00
	337.50
	225.00
	112.50
	0.00

PPFD: Photosynthetic Photon Flux Density (units: µmol/m²/s)

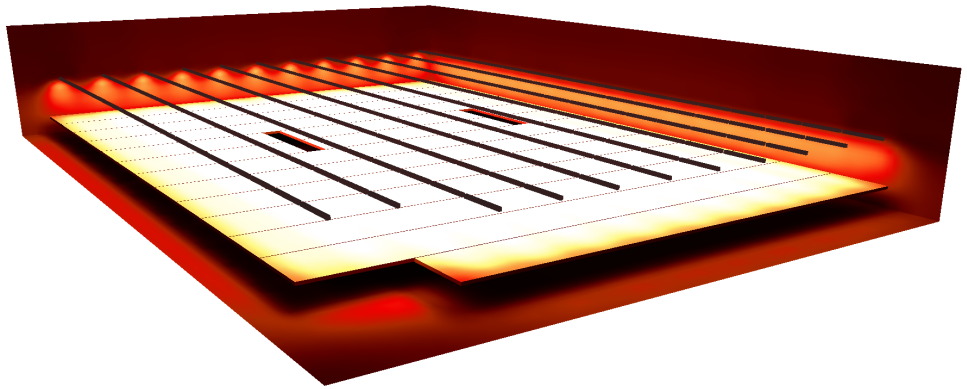
1000w DE HPS



134 VYPR 2p	Fixture Quantity	134 1000W DE HPS
~ 905 µmol/m²/s	PPFD Average	~ 902 µmol/m²/s
631 watts	Power per Fixture	1,080 watts
84,554 watts	Total Electrical Input	144,720 watts
4' from canopy	Fixture Mounting Height	4' from canopy

Flower Room 126

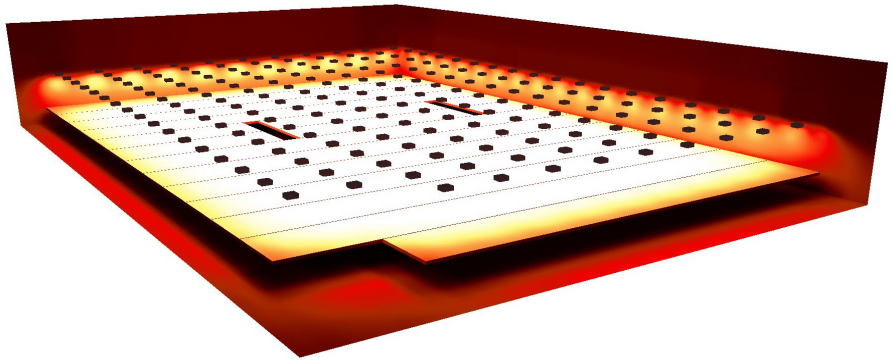
VYPR 2p



PPFD units: µmol/m²/s)	
	900.00
	787.50
	675.00
	562.50
	450.00
	337.50
	225.00
	112.50
	0.00

PPFD: Photosynthetic Photon Flux Density (units: µmol/m²/s)

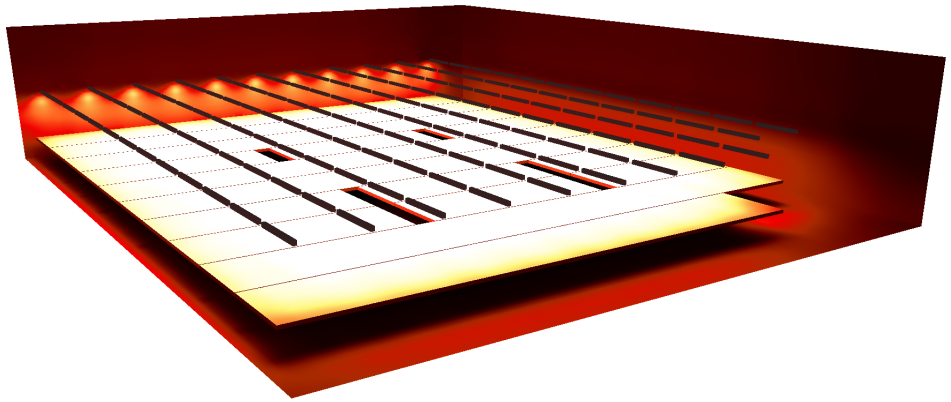
1000w DE HPS

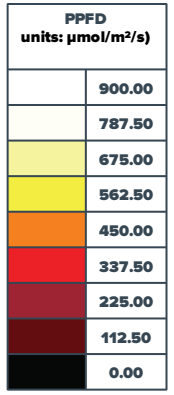


185 VYPR 2p	Fixture Quantity	185 1000w DE HPS
~ 895 µmol/m²/s	PPFD Average	~ 908 µmol/m²/s
631 watts	Power per Fixture	1,080 watts
116,735 watts	Total Electrical Input	199,800 watts
4' from canopy	Fixture Mounting Height	4' from canopy

Flower Room 135

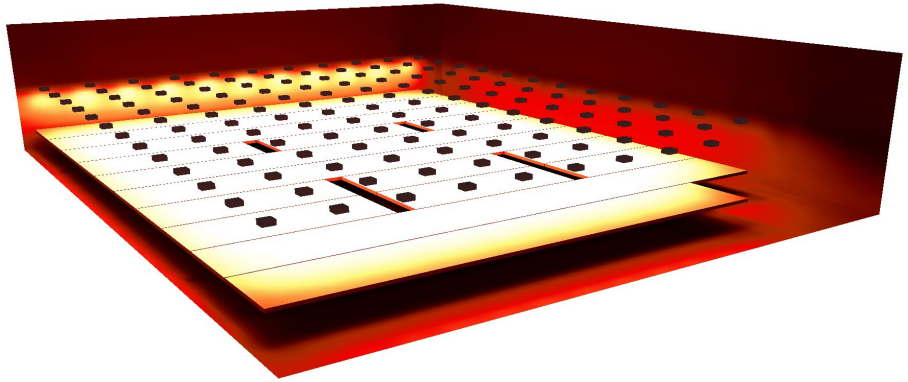
VYPR 2p





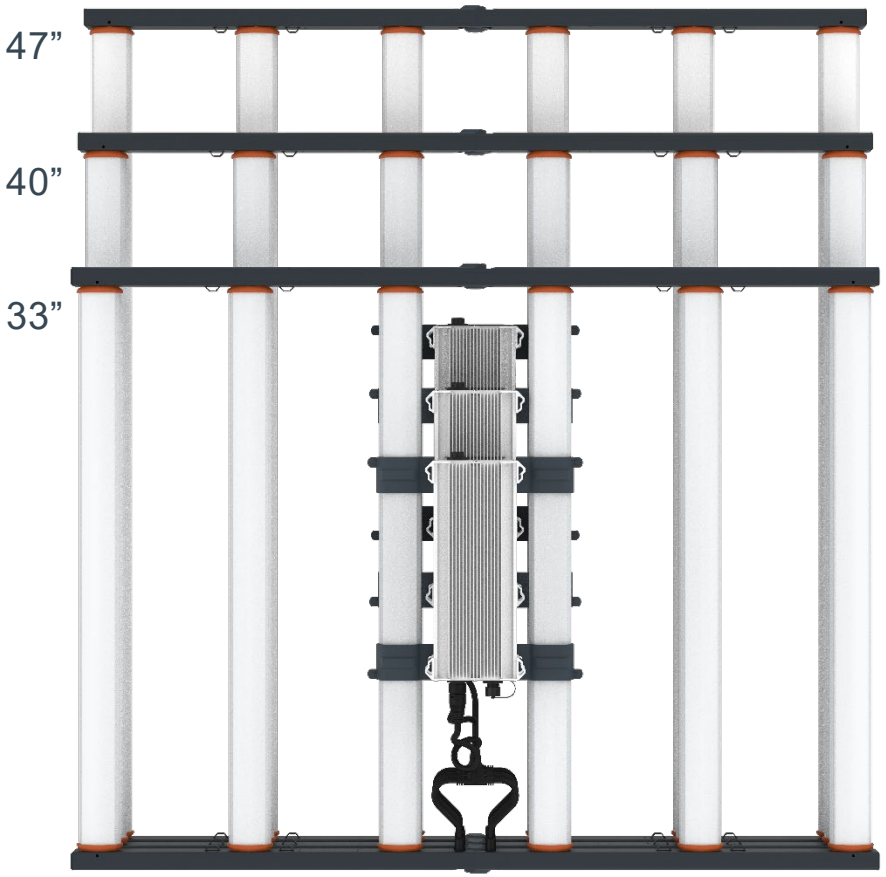
PPFD: Photosynthetic Photon Flux Density (units: µmol/m²/s)

1000w DE HPS



129 VYPR 2p	Fixture Quantity	129 1000w DE HPS
~ 885 µmol/m²/s	PPFD Average	~ 920 µmol/m²/s
631 watts	Power per Fixture	1,080 watts
81,399 watts	Total Electrical Input	139,320 watts
4' from canopy	Fixture Mounting Height	4' from canopy

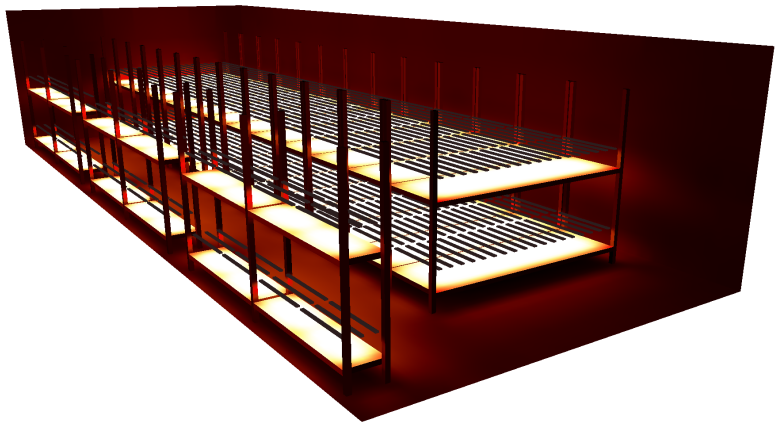
SPYDR 2x Flexible | Scalable | Uniform



SPYDR 2x SPECIFICATIONS	
PPF	860 µmol/s
Input Power	342W
Efficacy	2.5 µmol/j
Input Voltage	Autosensing 100-277V, 347V, 400V & 480V

Veg Room 136

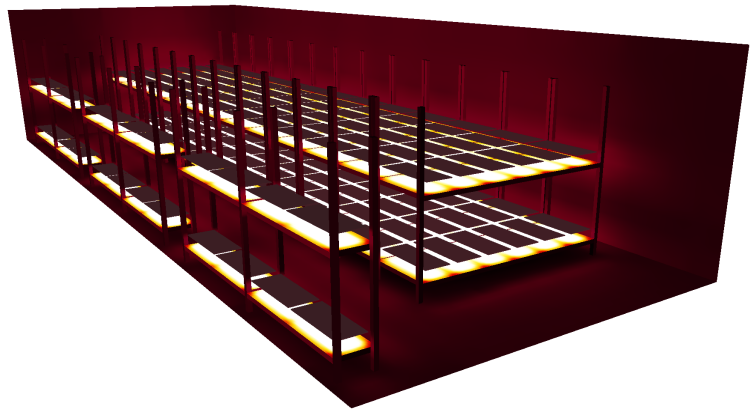
SPYDR 2x
SPYDRx PLUS



PPFD units: µmol/m²/s)	
	540.00
	473.00
	405.00
	338.00
	270.00
	203.00
	135.00
	68.00
	0.00

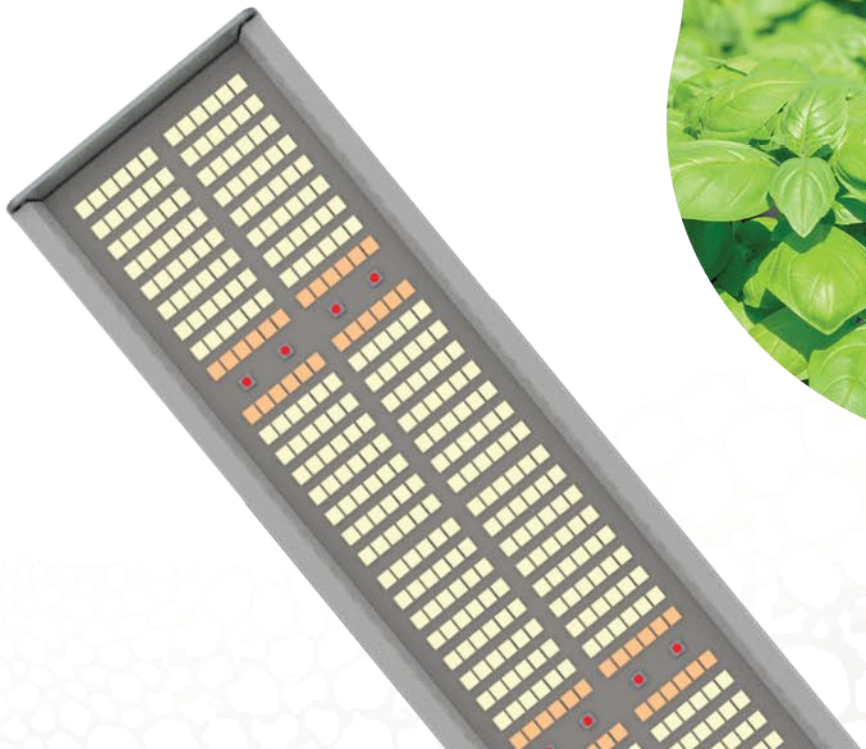
PPFD: Photosynthetic Photon Flux Density (units: µmol/m²/s)

T5HO



78 SPYDR 2x | 9 SPYDRx PLUS	Fixture Quantity	156 - 8 bulb T5HO| 48 - 10 bulb T5HO
~ 540 |500 µmol/m²/s	PPFD Average	~ 515 | 543 µmol/m²/s
342 watts | 660 watts	Power per Fixture	432 watts | 540 watts
32,616 watts	Total Electrical Input	93,312 watts
1' from canopy	Fixture Mounting Height	0.5' from canopy

VYPR 2x Powerful | Efficient | Shadow-free



VYPR 2x SPECIFICATIONS	
PPF	900 µmol/s
Input Power	342W
Efficacy	2.6 µmol/j
Input Voltage	Autosensing 100-277V, 347V, 400V & 480V

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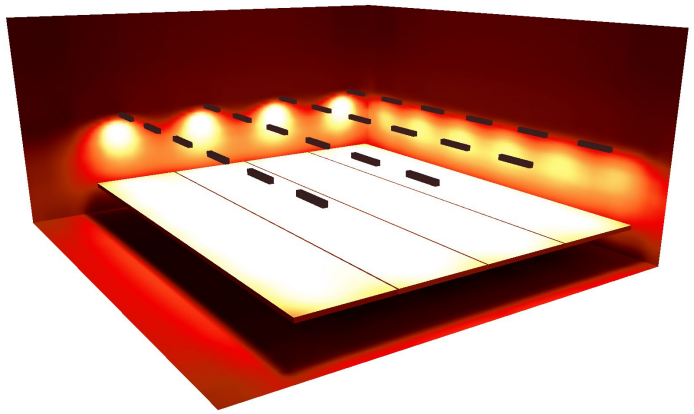
Mom Room 138

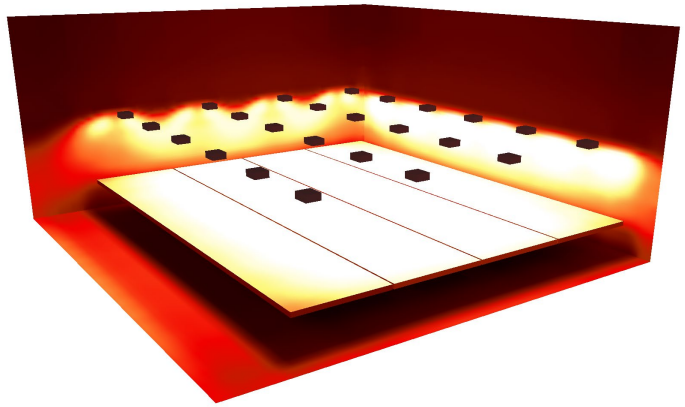
VYPR 2x



PPFD units: µmol/m²/s)	
	330.00
	289.00
	248.00
	206.00
	165.00
	124.00
	83.00
	41.00
	0.00

PPFD: Photosynthetic Photon Flux Density (units: µmol/m²/s)

1000w SE HPS



24 VYPR 2x	Fixture Quantity	24 1000w SE HPS
~ 330 µmol/m²/s	PPFD Average	~ 368 µmol/m²/s
342 watts	Power per Fixture	1,030 watts
8,208 watts	Total Electrical Input	24,720 watts
4' from canopy	Fixture Mounting Height	4' from canopy

Energy Savings Summary

Room	Legacy kWh	Proposed kWh	Annual kWh Saved
Flower 123	633,874	370,347	263,527
Flower 126	875,124	511,299	363,825
Flower 135	610,222	356,528	253,694
Veg 136	613,060	214,287	398,773
Mom 138	162,410	53,927	108,484
			1,388,302

That's equivalent to the consumption from 126 American homes each year!

MORE QUESTIONS? CONTACT:

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Consumers Energy
Business Energy Efficiency Program

Rachel Fredrickson

Consumers Energy
Count on Us®

We are Here to Help

Comprehensive Business Incentives

Prescriptive Incentives

- Over 300 measures in total
- 45 measures specific to agriculture

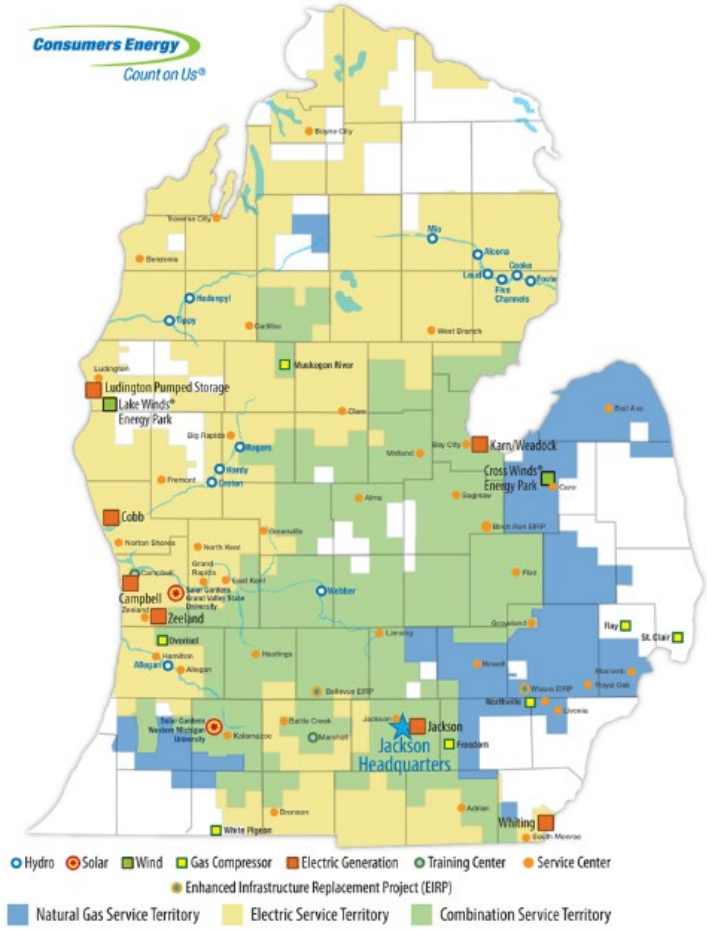
Custom Incentives

- Incentives are determined on a case-by-case basis
- Must be between a 1 and 8 year payback period

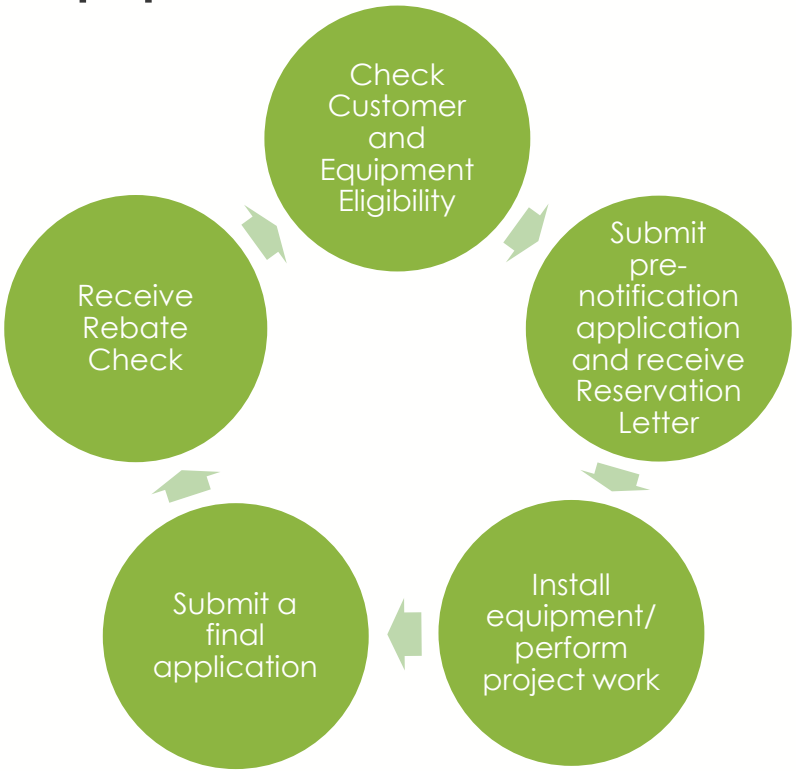
Note: Incentives are paid upon project completion and final engineering approval.

How Do I Qualify?

- Consumers Energy business account number (natural gas, electric or combination)
- Federal tax ID number
- New construction projects must be located within our territory and be using Consumers Energy as their energy provider



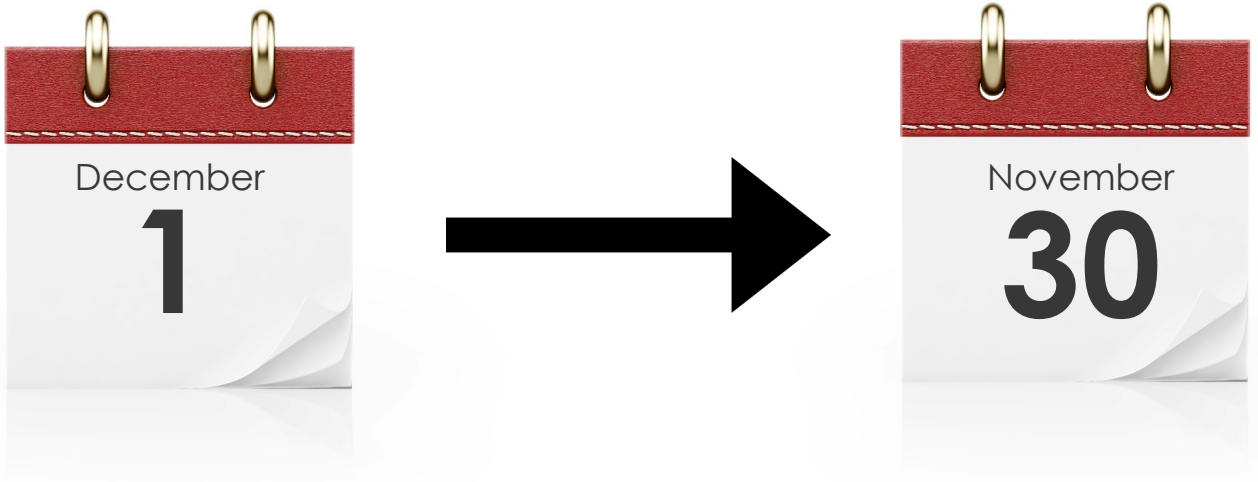
Incentive Application Process



Incentive Caps and Limits

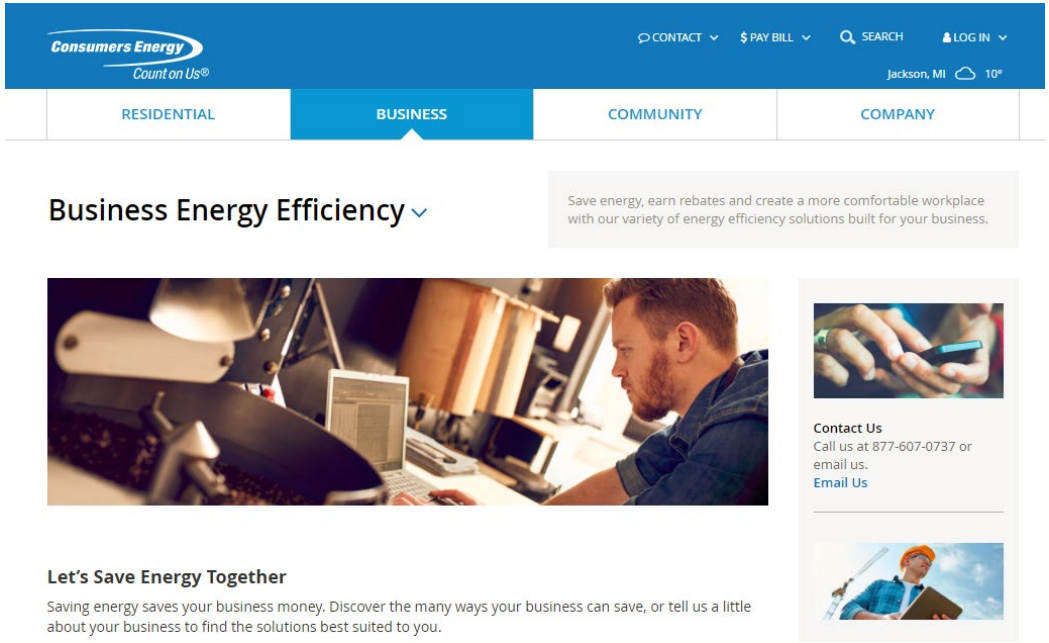
Facility Incentives	Cap per Program Year
Prescriptive	75% of the total project cost
Custom	50% of the total project cost
Customer Limits	**Cap per Program Year**
Large Natural Gas	$1M across all facilities per customer
Large Electric	$2M across all facilities per customer

Program Effective Dates



Incentive Resources

ConsumersEnergy.com/startsaving

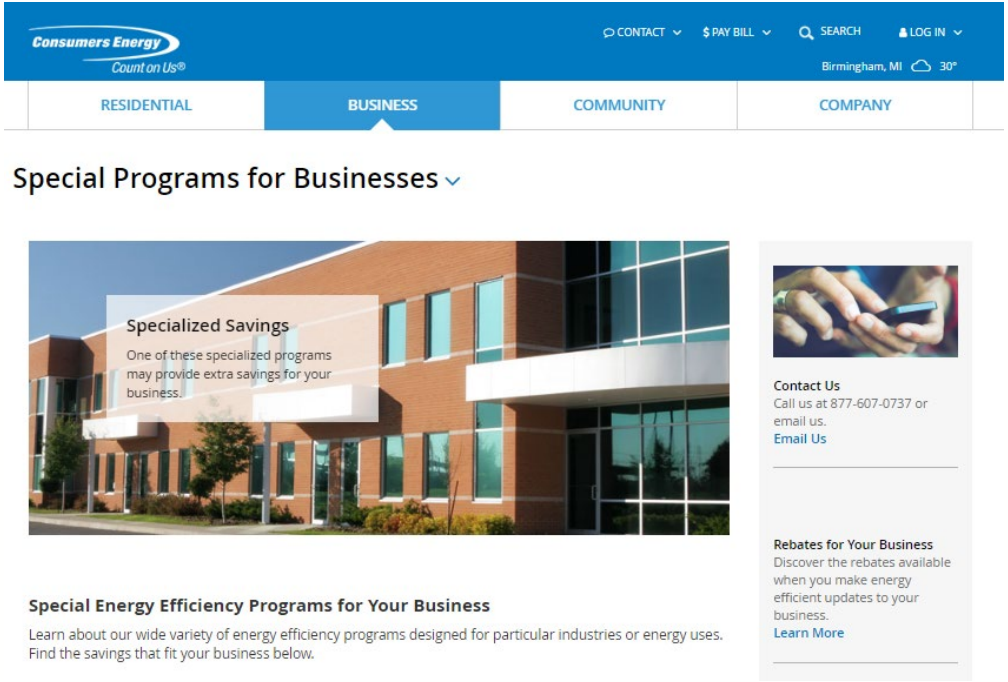


Trade Ally Program

- Contractors that have been trained by Consumers Energy on how to use the efficiency program
- Third party payment release
- Find a contractor
- Consumersenergy.com/business/energy-efficiency/select-a-contractor

Additional Specialty Programs

- New Construction
- Buy Michigan Bonus
- Steam Trap Express
- Network Lighting Controls
- Business Instant Discount
- Michigan Saves



Energy Efficiency Success

T REX Enterprises

Energy Efficiency Success

Fluresh

QUESTIONS?

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TWEAKING THE MARGINS: HOW CONTROLS SET YOU UP FOR A BETTER YIELD AND A LEANER OPERATING BUDGET

Please fill out our 2 minute survey at the end of this webinar. Thank you!

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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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WEGE FOUNDATION