# MOSS MELT
## CONCENTRATE


MAKE THE CHANGE TO A SAFER
MORE EFFECTIVE MOSS KILLER
OMRI
LISTED
For Organic Use


Your customers will appreciate the quick visible results, environmental safety, and fresh citrus scent

# MOSS MELT
## CONCENTRATE

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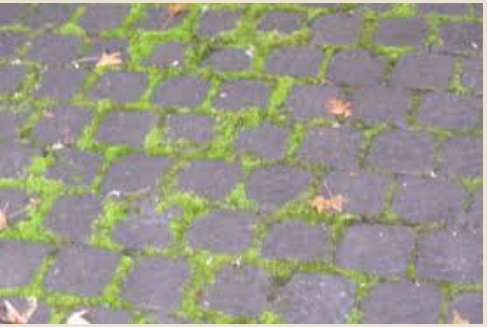
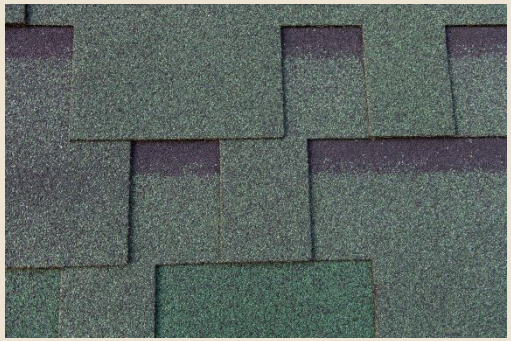
# Multi Site Use





# MOSS MELT
## CONCENTRATE

## Fast Acting / Effective Moss & Algae Control

- ❖Low Dose Technology
- ❖Multi Site Use
- ❖Non Staining / Non Corrosive Formulation
- ❖Superior Worker & Environmental Safety
- ❖NOP Organic Listed – OMRI listed
- ❖Fresh Citrus Smell

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# MOSS MELT
## CONCENTRATE

**Visual results with in 1-3 days**

- ❖ **Moss in grass typically will turn white**
- ❖ **Roof and hard surface moss will turn yellow to dark orange/brown**

**Benefit**

- ❖ **Customers see results quickly**
- ❖ **Less wait time to remove dead moss**

# MOSS MELT
## CONCENTRATE

## What is Moss Melt?

## Active Ingredient

- 70% d-limonene formulated as an emulsion to reduce volatilization and increase wet time

## Mode of Action

- D-limonene is a natural degreaser that dissolves the protective coating (cuticle) of moss and algae
  - Leading to quick desiccation and death of treated moss & algae.
- Herbicide selectivity – 2% concentration kills moss & algae but does not affect turf or plants

# MOSS MELT
## CONCENTRATE

## Product Overview

- An 'EC': emulsifiable, concentrated liquid
- List 4, organic ingredients, NOP compliant
  - Formulation contains surfactants, plant extracts and inerts critical to efficacy
- CAUTION Signal Word
  - Moderate eye irritation
- Pack Size
  - 1 Gallon & 2.5 Gallon jugs
  - 55 Gallon Drums – Special Order

# MOSS MELT
## CONCENTRATE

## Product Overview

- Limonene occurs naturally in citrus and certain fruits, and is used in soaps, foods and perfumes
- A natural industrial degreasing agent
  - which removes / dissolves the waxy cuticle found on all plants, causing them to desiccate and die
- Knockdown activity - fast wilting or necrosis of moss

# MOSS MELT
## CONCENTRATE

## Low Dose Technology

- Moss Melt is effective at a 2% spray solution concentration – 2.56 ounces per gallon of water
- One gallon of Moss Melt will treat up to 12,500 sq. ft.
- Typical application rate is 3-4 gallons of spray solution/ 1000 ft2
- Benefits
  - Less material handling
  - Reduced pesticide use
  - Reduced environmental impact

# MOSS MELT
## CONCENTRATE

## Labelled Use Sites:

### Hard Surfaces and Roof Care

- Roofs, Driveways, Fences, Decks, Siding, Steps, Patios,
- Other Outdoor Surfaces constructed of Composition Shingles, Wood, Asphalt, Concrete, Brick, Tile, Stone and Plastic Resins

# MOSS MELT
## CONCENTRATE

# Labelled Use Sites

## Hard Surfaces and Roof Care

- non-staining formula, does not stain concrete, brick, pavement, stucco or wood
- Will not damage:  gutters, metal flashing or downspouts
- Safe to landscape plants when used at 2% concentration
- Reduced concern for gutter spout run off & off target mist
- Avoid treating newly painted surfaces

# MOSS MELT
## CONCENTRATE

## Labelled Use Sites

## Lawns and Turf

- ❖Field tested safe on ryegrass & bentgrass
- ❖Non-staining, ideal for lawn use along sidewalks, patio etc. where iron products can stain
- ❖Ideal for organic landscape, or customers concerned about pet or children exposure

# MOSS MELT
## CONCENTRATE

## Labelled Use Sites

### Borders and Landscape Areas

- Spray beneath and around base of plant material
  - Not labeled for over the top applications
  - Safe around landscape plants when used at 2% concentration

# MOSS MELT
## CONCENTRATE

## Worker Safety

- Moss Melt Carries the lowest signal word " Caution"
  - The concentrate can cause moderate eye irritation
- Protective Equipment
  - Long sleeved shirt and pants, shoes plus socks, protective eyewear.
- Re-entry safe when spray solution is dry

# MOSS MELT
## CONCENTRATE

## Environmental Safety

- ❖Moss Melt is NOP organic listed & OMRI listed
- ❖USDA classifies limonene as GRAS (Generally Recognized As Safe), essentially no measurable toxicity
- ❖Has very low to minimal environmental impacts
- ❖Dissipates shortly after application through volatilization and biodegradation –ZERO RESIDUE PRODUCT
- ❖Reduced concern for run off into sensitive areas

# Environmental Safety

| | | | |
|---|---|---|---|
| Potential hazard is low | | Potential hazard is moderate | |
| Potential hazard is high | | Unable to find useful data | |

| Pesticide Active Ingredient | Human Toxicity | Other Mammals | Bird Toxicity | Bee Toxicity | Aquatic Toxicity | Mobility Hazard | Persistence Hazard | Bio-accumulation Hazard |
|---|---|---|---|---|---|---|---|---|
| ammonium nonanoate | | | | | | | | |
| ammonium salt of fatty acids | | | | | | | | |
| ferric sulfate | | | | | | | | |
| zinc sulfate monohydrate | | | | | | | | |
| ferrous sulfate (monohydrate) | | | | | | | | |
| iron HEDTA | | | | | | | | |
| pelargonic acid (nonanoic acid) | | | | | | | | |
| d-limonene (limonene) | | | | | | | | |
| potassium salt of fatty acids | | | | | | | | |

# MOSS MELT
## CONCENTRATE

## Ideal For Cool Cloudy Conditions

- Moss Melt provides an option to treat moss under cool and cloudy conditions resulting quick visual results
- Moss control can be obtained in 40 degree temperatures under cloudy conditions.
- This allows treatment at the optimal time when moss is moist and actively growing
- Competing acid based or soap based organic herbicides require warm temperatures and/or direct sunlight for effective control.

# MOSS MELT
## CONCENTRATE

## Basic Moss Biology

- Most mosses are bryophytes, not a vascular plant and they have no roots.
- Because mosses do not have roots, they can't take up water from soil as many other plants do.
- This means that they need flowing or falling water in order to thrive.

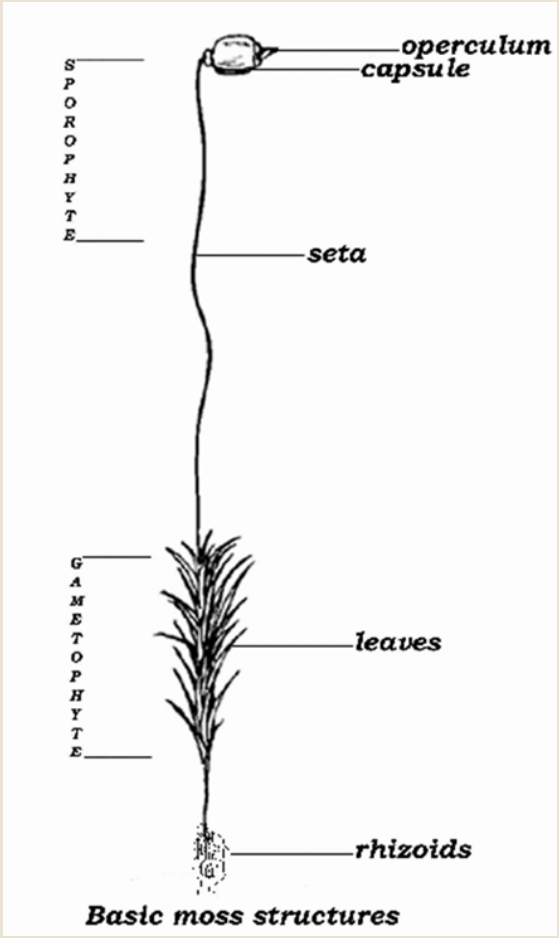
# MOSS MELT
## CONCENTRATE

## Basic Moss Biology

- Some mosses are able to take up nutrients from water flowing over them, thus they have very effective absorptive surfaces.
- Their leaves are mostly one cell thick, they have no true roots, stems, flowers, or fruit, and instead of seeds they have spores.

# MOSS MELT
## CONCENTRATE

# Basic Moss Biology




Basic moss structures

# MOSS MELT
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## Effective Moss Herbicides

- Since moss grows without xylem or phloem, they have no means to translocate foliar-absorbed nutrients or pesticides.
- Contact herbicides are most effective and the spray solution must come in contact with most of the living tissues to effectively kill moss.

# MOSS MELT
## CONCENTRATE

## Effective Moss Herbicides

- Moss Melt dissolves the protective coating eliminating the moss's ability to hold moisture.
- The treated moss will not be able to recover from a treatment.

# MOSS MELT
## CONCENTRATE

# Why Control Moss?

- Hardsurfaces
  - Can be a slip hazard
  - Over time the moss contributes to the breakdown of cement, stone and other surfaces

# MOSS MELT
## CONCENTRATE

# Why Control Moss?

- Roofs
  - Reduces water flow and increases debris accumulation
  - Over time the moss contributes to the breakdown of roofing materials reducing their life

# MOSS MELT
## CONCENTRATE

# Why Control Moss?

- Lawns / Turf Areas
  - Unsightly and leads to thinning of stand
  - Difficult to re-seed or establish grass in mossy areas

# MOSS MELT
## CONCENTRATE

## What Damage Does Moss Do?

**Contrary to popular belief, moss does not directly destroy hardsurfaces or roofs.**

**It is the persistent accumulation of moisture that causes the problem.**

- **The pH of the water leads to mineralization**

**The rhizods however, can penetrate cracks or go beneath roof shingles and expand with moisture & freezing**

# MOSS MELT
## CONCENTRATE

# How Long Does Moss Melt Keep the Away?

**Moss Melt has no residual activity, it kills the active moss and spores and is gone fairly quickly.**

**The moss will die and become black and can easily be removed with in 1-2 weeks.**

**If the moss carcass's are not removed they will continue to be a site for moisture and nutrient accumulation leading to a return infestation**

**** Our experience is a treatment will eliminate moss for 6-9 months depending on the time of year of the treatment.**

# Liverwort

# MOSS MELT
## CONCENTRATE

## Liverwort

- The general features of the liverwort life cycle are the same as in mosses.
- They are a division of non-vascular bryophyte land plants commonly referred to as hepatics
- Moss Melt is effective on Liverwort – but it can require a 3-4% concentration of spray solution.

# MOSS MELT
## CONCENTRATE

## Application Tips

- Application Methods
  - Most backpack or tank sprayers (use high volume spray tip)
  - Watering Can, Hose End Sprayers Etc.
- Concentration is key
  - 2% concentration will kill the moss an algae, for thicker moss use more spray solution
  - Higher concentrations wont necessary work better or faster and can injury grass and plants (10% ++ concentrations)

# MOSS MELT
## CONCENTRATE

**Coverage is Essential**

- **This is a contact Herbicide - only contacted areas will be affected**
- **Use spray equipment, ground speed and nozzles for optimal/complete coverage**

**Moss Conditions**

- **Spray moss that are actively growing & not drought stressed**

**Spray Conditions**

- **Wet Time is Key to dissolving the moss cuticle / make applications during cooler time of the day to allow a slower drying time.**

# MOSS MELT
## CONCENTRATE

## Application Tips

**Rate – 2.56 oz / gallon of water ( 2% spray solution)**

**Water Volume – 3-4 gallons of spray solution / 1000 ft2**

**Coverage –**

- **Lawn & Turf thoroughly coat moss with spray solution**
- **Dense Moss – ensure entire moss clump gets soaked**

**Application Timing**

- **Apply to moist actively growing moss**
- **Avoid applications when moss is water soaked**
- **Allow heavy dew to dissipate, do not apply shortly after a rain shower**

**Temperature Range**

- **When daytime temperature are between 40 & 75 F**
- **Rain Fast – Moss Melt is rain fast with in 1 hour of application**

# MOSS MELT
## CONCENTRATE

**Application Tip: Wet Moss**

**Moist to wet moss is the best treatment condition.**

- **The cuticle is typically thin**
- **The moss is taking in free moisture.**

**Water logged moss or application during rain may take slightly high volumes of spray solution.**

# MOSS MELT
## CONCENTRATE

## Treatment Site & Spray Volume

### Turf & Lawn Areas:

**Spindly loose growing moss in lawns can require lower spray volumes.**

- **2 gallons spray solution / 1000.**

**Dense clumps of moss in lawns will require the standard 3-4 gallons of spray solution**

# MOSS MELT
## CONCENTRATE

## Treatment Site & Spray Volume

## Dense Moss vs Spindly Moss

# MOSS MELT
## CONCENTRATE

**Application Tip: Dormant Moss**

**You Cant Kill Dormant Moss!**

***Applications to dormant moss are ineffective!***

**During hot dry periods, moss will go dormant, it dries down and is no longer active. When in this state is pretty much impervious to chemicals.**

# MOSS MELT
## CONCENTRATE

**Silver Thread Moss**

## Golf Course Greens

**Testing & commercial use this season showed the best results were with 2% spray solution applied @ 1.5 – 2 gallons / 1000.**

**Slight tip burning was observed**

** ***Very cost effective at this lower use rate*!**

# MOSS MELT
## CONCENTRATE

**2% Spray Solution Before & 3 DAT**

# MOSS MELT
## CONCENTRATE

**2% Spray Solution Before & 3 DAT**

# MOSS MELT
## CONCENTRATE

**2% Spray Solution Before & 3 DAT**

# MOSS MELT
## CONCENTRATE

**Application Tip: Backpack Sprayers**

**USE THE CORRECT SPRAY TIP!**

**High volume, larger droplet size work best, 8008, 8010, 8011 are good tip sizes to use**

***Standard spray nozzles will work but, most are low spray volume and increase application time.*

# MOSS MELT
## CONCENTRATE

**Application Tip:** Hose End Sprayers

**Treatment Site: Best for roof & hard surfaces**

- **For roof treatments allows treatment from the gutter level**
- **Hard surface treatments ensures good spray solution volume**

***Most of the hose end sprayers I have tested are not highly accurate in mixing the correct ratio.*

# MOSS MELT
## CONCENTRATE

## Application Tip: Hose End Sprayers

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# MOSS MELT
## CONCENTRATE

**Application Tip:** Tank Sprayers

**Treatment Site:** Ideal for all surfaces

**High volume & adjustable spray pattern , make this ideal for all treatment sites.**

# MOSS MELT
## CONCENTRATE

## Application Tips

- Hard Surfaces
  - Use a directed spray method when bands of Moss are growing between pavers
  - Lower spray tip to increase penetration of thicker moss
  - Ensure thorough wetting of treated moss
- Landscape Areas
  - Use directed spray method, do not spray over plant material
- Turf
  - Typically this moss will grow more loosely and lower spray volumes can be used.

# MOSS MELT
## CONCENTRATE

## Tank Mixing

- Hard Surfaces & Landscape Areas
  - Compatible with most herbicides, and soil applied insecticides
    - If unsure jar test for compatibility
  - May not fit based on spray solution rate per 1000 or concentration of herbicide
- Lawns & Turf
  - Use caution with herbicides as Moss Melt can act as a surfactant / penetrant possibly reducing selectivity or increasing grass damage

# MOSS MELT
## CONCENTRATE

## IMPORTANT MIXING INSTRUCTIONS

- This is an EC formulation, the entire tank load must be mixed well to ensure a complete emulsion is created.
- Fill tank or back pack ½ full and begin to add Moss Melt while agitating
  - Backpack sprayers stir vigorously or use a jet stream while filling.
- Once sprayer load is emulsified the product will remain stable

# MOSS MELT
## CONCENTRATE

## IMPORTANT MIXING INSTRUCTIONS

- If the spay solution is not properly mixed there can be a separation in the tank, where the d-limonene is at the top and the surfactants are lower.
- This will can lead to poor erratic performance and allow the active ingredient to volatilize before it can melt the cuticle

# MOSS MELT
## CONCENTRATE

## Spray Solution Volume

**Large Treatment Areas: Roofs, Pavement**

- **Tank sprayers or hose end sprayers may be best.**
  - **It can be difficult to get 3.5 – 4 gallons per / 1000 sq. ft. using a backpack on dense moss.**
  - **If using a back pack use a higher volume bigger droplet nozzle to ensure good penetration of dense moss.**

# MOSS MELT
## CONCENTRATE

## Trouble Shooting

**With proper application moss should be visibly dead with in 2-3 days**

**If the moss appears to be unaffected review**

- **Was proper agitation was used**
- **Was there heavy rain during or at the end of treatment**
- **Was the moss water logged at the time of treatment**
- **Was the moss dormant or drought stressed during treatment**

# MOSS MELT
## CONCENTRATE

## Trouble Shooting

**Dense moss appears to be dead around the edges but the centers are still green**

- **Not enough water volume was used for the application**

**Treatment area looks blotchy**

- **Check spray pattern and water volume over entire treated area.**
- **Was treatment applied during temperatures over 75 degrees**

# MOSS MELT
## CONCENTRATE

## Common Questions

**How long will the material be around?**

- Typically the d-limonene will volatilize away with in 1-2 hours

**Will treated surfaces be slippery?**

- When applied at the 2% rate treated areas are not slippery

**Should I use a heavier concentration for thick moss?**

- No, a 2% concentration is all you need, just increase the spray solution volume on the treated area.

**Will Moss Melt remove black algae staining?**

- It will kill the algae but not sure it will remove the stain

# MOSS MELT
## CONCENTRATE

## Common Questions

**Because it is organic does work as well as non organic / conventional products?**

❖It works as well or better in most applications

**Does being organic make it more expensive than other products?**

❖No- because the use rate is so low it is very comparable or less expensive than conventional products.

**Is there risk of residue remaining or moving offsite ?**

❖Very little – Moss Melt is a zero residue product, and the active ingredient volatilizes away with in 1-2 hours.

# MOSS MELT
## CONCENTRATE

## Common Moss Control Herbicides

**Iron**

- Use in lawns & landscape
- Turns moss black
- Mode of action, chemical toxicity
- Issues, staining / odor / soil build up

**Zinc**

- Use on hard surfaces & roofs
- Need rain or moisture to activate
- Mode of action, Chemical toxicity
- Issues, worker safety, aquatic & ecotoxin, environmental build up

# MOSS MELT
## CONCENTRATE

## Cost Effective

- Hard Surfaces and Roof Care
  - Lowest use rate per 1000/sq. ft. of EPA registered moss herbicides
  - Lowest cost / 1000/sq. ft.
- Lawns and Turf - Borders and Landscape Areas
  - Lowest use rate per 1000/sq. ft. of EPA registered moss herbicides
  - Slightly higher cost than fertilizer grade iron sulfate

# MOSS MELT
## CONCENTRATE

## Moss Melt Coverage Area Comparison

**1 Gallon of Moss Melt treats 12,560 square feet**

**To treat the same area you would need**

- **75 pounds of Zinc Sulfate**
- **50 pounds of Iron Sulfate**
- **5-8.8 gallons of Quik-Fire**

**The Benefit**

- **Reduced Material Handling**
- **Decreased residual entering the environment**

# MOSS MELT
## CONCENTRATE

# Comparison Of Liquid Moss Products

| Active Ingredient | Brand | Concentration | Oz / gallon / Dilute | Dilution | Treatment Area | Spray Sol Gallons/ 1000 | OZ /1000 | Cost / Gal | Cost / 1000 |
|---|---|---|---|---|---|---|---|---|---|
| d-limonene | Moss Melt Concentrate | 70% | 2.56 | 2% | 1,000 | 3.83 | 9.8 | $95.00 | **$ 7.28** |
| d-limonene (Lawn Treatments) | Moss Melt Concentrate | 70% | 2.56 | 2% | 1,000 | 2 | 5.1 | $95.00 | **$ 3.80** |
| Nonanoic acid | Scythe | 57% | 7.00 | 5% | 1000 | 4.65 | 32.6 | $63.00 | **$16.02** |
| Potassium Laurate | Safer Moss, Algae Killer | 40% | 4.00 | 3% | 1000 | 20 | 80 | $71.96 | **$44.98** |
| potassium salts of fatty acids | Quik-Fire | 22% | 26.00 | 20% | 1000 | 3.5 | 91 | $24.00 | **$17.06** |
| potassium salts of fatty acids | Moss Out | 22% | 27.00 | 21% | 1,000 | 3.5 | 95 | $59.26 | **$24.80** |
| Sodium hypochlorite + Alkaline salts | 30 Seconds | 50% | 64.00 | 50% | 1,000 | 3 | 192 | $ 9.50 | **$14.25** |
| Alkyl* dimethyl benzyl ammonium chloride | Wet & Forget | 10% | 21.00 | 16% | 1000 | 6 | 126 | $26.00 | **$25.59** |
| Chlorine Bleach | Bleach | ?? | 64.00 | 50% | 1,000 | 3 | 192 | $ 8.50 | **$12.75** |

# MOSS MELT
## CONCENTRATE

# Comparison Of Granular Moss Products

| ZINC | | | | | Control / Moss Kill Rate | |
|---|---|---|---|---|---|---|
| **AI** | **Brand** | **Concentration** | **Treatment Area** | **lbs/ 1000** | **Cost / lb** | **Cost / 1000** |
| **Zinc Sulfate** | **Fertilizer Grade** | 99% | 1,000 | 5 | $ 0.80 | **$ 4.00** |
| **Zinc Sulfate** | **Moss B Ware** | 99% | 1,000 | 5 | $ 3.66 | **$ 18.30** |
| **Zinc Sulfate** | **Moss Kil Granules** | 99% | 1,000 | 5 | $ 3.00 | **$ 15.00** |
| **Zinc Sulfate** | **Rid Moss** | 36% | 1,000 | 5 | $ 3.10 | **$ 15.50** |
| **Zinc Sulfate** | **Moss Out** | 35% | 1,000 | 5 | $ 3.33 | **$ 16.65** |
| **IRON** | | | | | | |
| **AI** | **Brand** | **Concentration** | **Treatment Area** | **lbs/ 1000** | **Cost / lb** | **Cost / 1000** |
| Ferrous Sulfate | Ferilizer Grade | 20% | 1,000 | 4 | $ 0.30 | **$ 1.20** |
| Ferrous Sulfate | No Moss | 10% | 1,000 | 10 | $ 0.91 | **$ 9.10** |
| Ferrous Sulfate | Moss Control | 32% | 1,000 | 8 | $ 1.80 | **$ 14.40** |
| Ferrous Sulfate | Rid Moss | 47% | 1,000 | 8 | $ 3.60 | **$ 28.80** |
| Ferrous Sulfate | Rid Moss | 14% | 1,000 | 10 | $ 1.80 | **$ 18.00** |

| Active Ingredient | Brand | Concentration | Oz / gallon / Dilute | Dilution | Treatment Area | Spray Sol Gallons/ 1000 | OZ /1000 | Cost / Gal | Cost / 1000 |
|---|---|---|---|---|---|---|---|---|---|
| **d-limonene** | **Moss Melt Concentrate** | 70% | 2.56 | 2% | 1,000 | 3.83 | 9.8 | $95.00 | **$7.28** |
| **d-limonene (Lawn Treatments)** | **Moss Melt Concentrate** | 70% | 2.56 | 2% | 1,000 | 2 | 5.1 | $95.00 | **$3.80** |

# MOSS MELT
## CONCENTRATE

## Treatment Opportunities

- **Hard surfaces adjoining lawns**
  - Reduce staining potential of hard surfaces by applying Moss Melt along these hard surfaces
- **Driveways / Sidewalks / Curbs**
  - Eliminates moss with a single application, moss carcass's will die and eventually weather away or can be brushed away later
  - Reduces concerns over entry into drainages
- **Siding**
  - Safely eliminates green algae on building siding
- **Organic Customers**
  - Entire yard moss control

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# MOSS MELT
## CONCENTRATE

**Summary:**

- **Effective Moss & Algae Control**
- **Cost Effective Enough to Use on All Treatment Areas**
- **Lower Worker Safety Risk / Reducing Concerns About Applicator Exposure**
- **Excellent Environmental Safety**

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# MOSS MELT
## CONCENTRATE

Moss Melt Concentrate

# 2008 Moss Trials

December 8, 2008

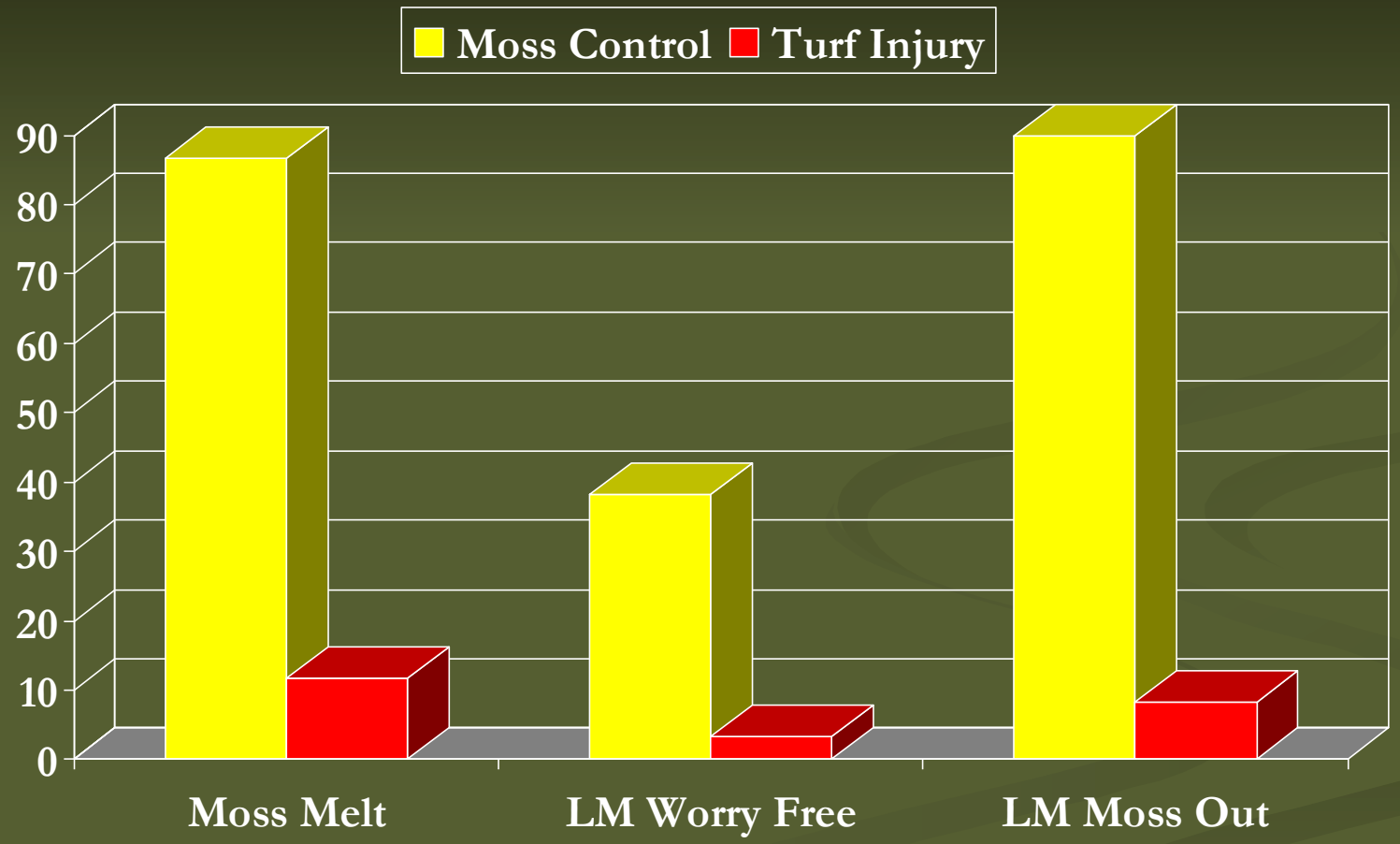
# University of Massachusetts (UM) Trials Moss Control & Turf Phytotoxicity

by Prasanta Bhowmik

- **2 sets of trials were conducted by UM:**
  1. **Trial #1:** Comparative trials between Moss Melt applied by **backpack** and **hose-sprayers** (July, 2008) compared to WF Moss & Algae and Lilly Miller Moss-Out. Trials were at two (2) different locations
  2. **Trial #2:** Greenhouse trial comparing Moss Melt (Oct, 2008)
- Products & Rates Applied:
  1. Moss Melt **(70% d-limonene) –**
     - **10.51 fl oz/1000 ft2**
  2. Worry Free Moss & Algae **(15% sodium lauryl sulfate & 6% citric Acid) –**
     - **32 fl oz/1000 ft2**
  3. Lilly Miller Moss-Out **( 9.75% ferric sulfate) –**
     - **64 fl oz/1000 ft2**
  4. **Spray Solution on backpack trials – 2.3 gal/1000 ft2**

# **Bentgrass:** Backpack Spray – **Day 7**

**University of Massachusetts,** Amherst Resident - July, 2008

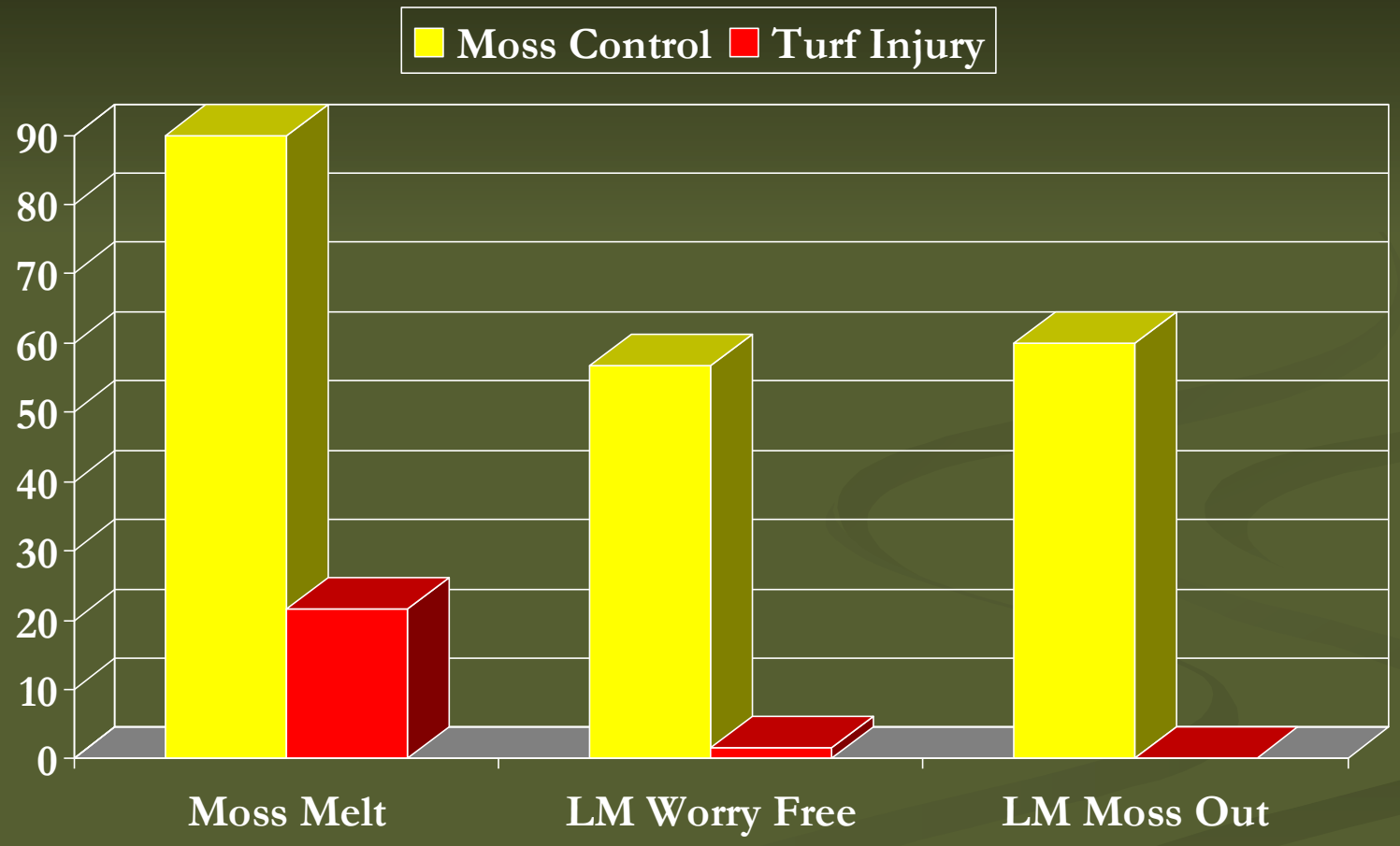



Dr. Prasanta Bhowmik, Dept. of Plant, Soil, and Insect Sciences

2.29 gal/1000 spray solution
TeeJet 1104 VS

# **Bentgrass:** Garden Hose End – Day 23

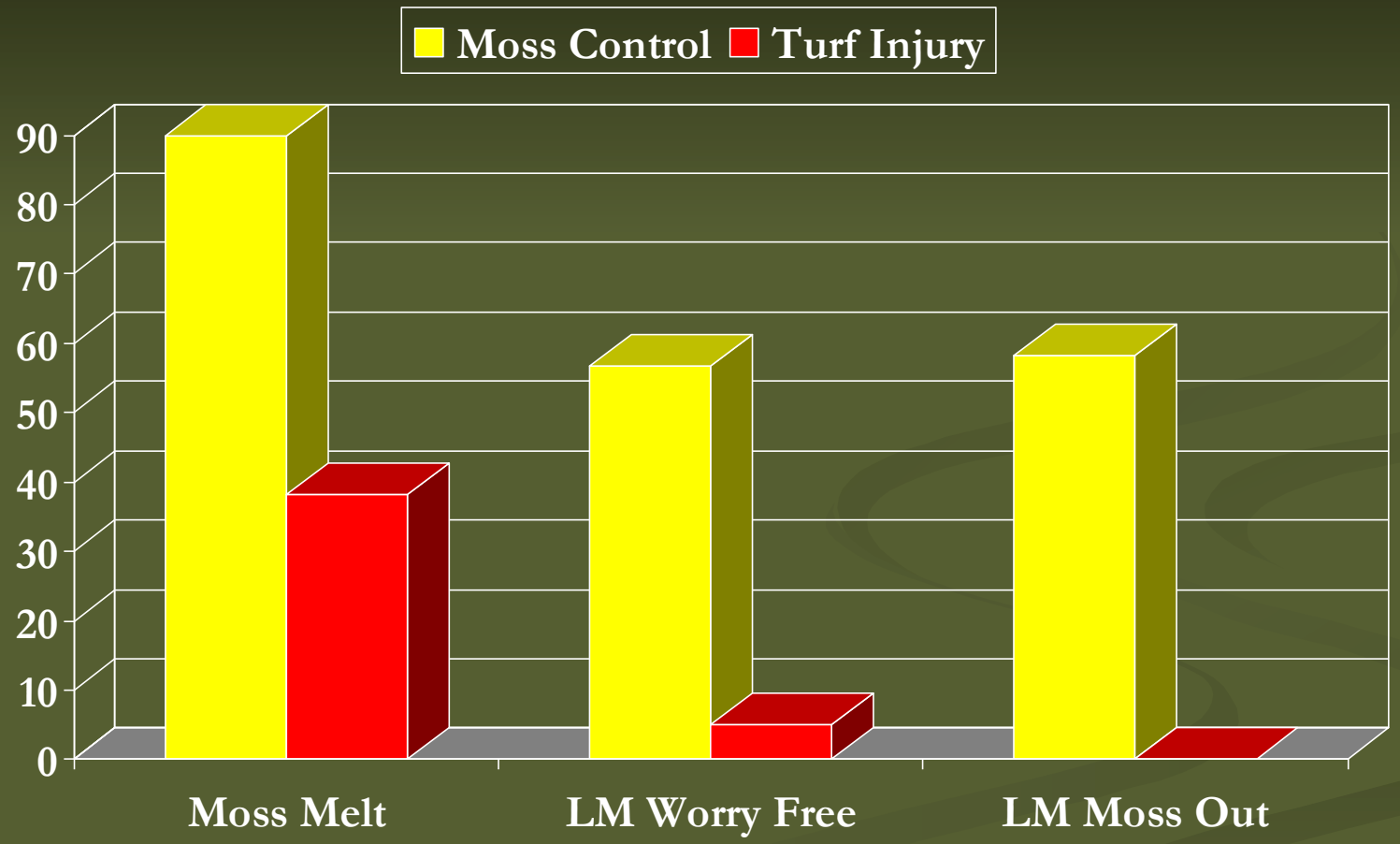
**University of Massachusetts,** Amherst Resident - July, 2008




Ratings are from 0 to 100: 0 = no effect, 100 = total effect

# **Bentgrass:** Garden Hose End – Day 7

**University of Massachusetts,** Amherst Resident - July, 2008

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# **Bentgrass:** Backpack Spray – **Day 23**

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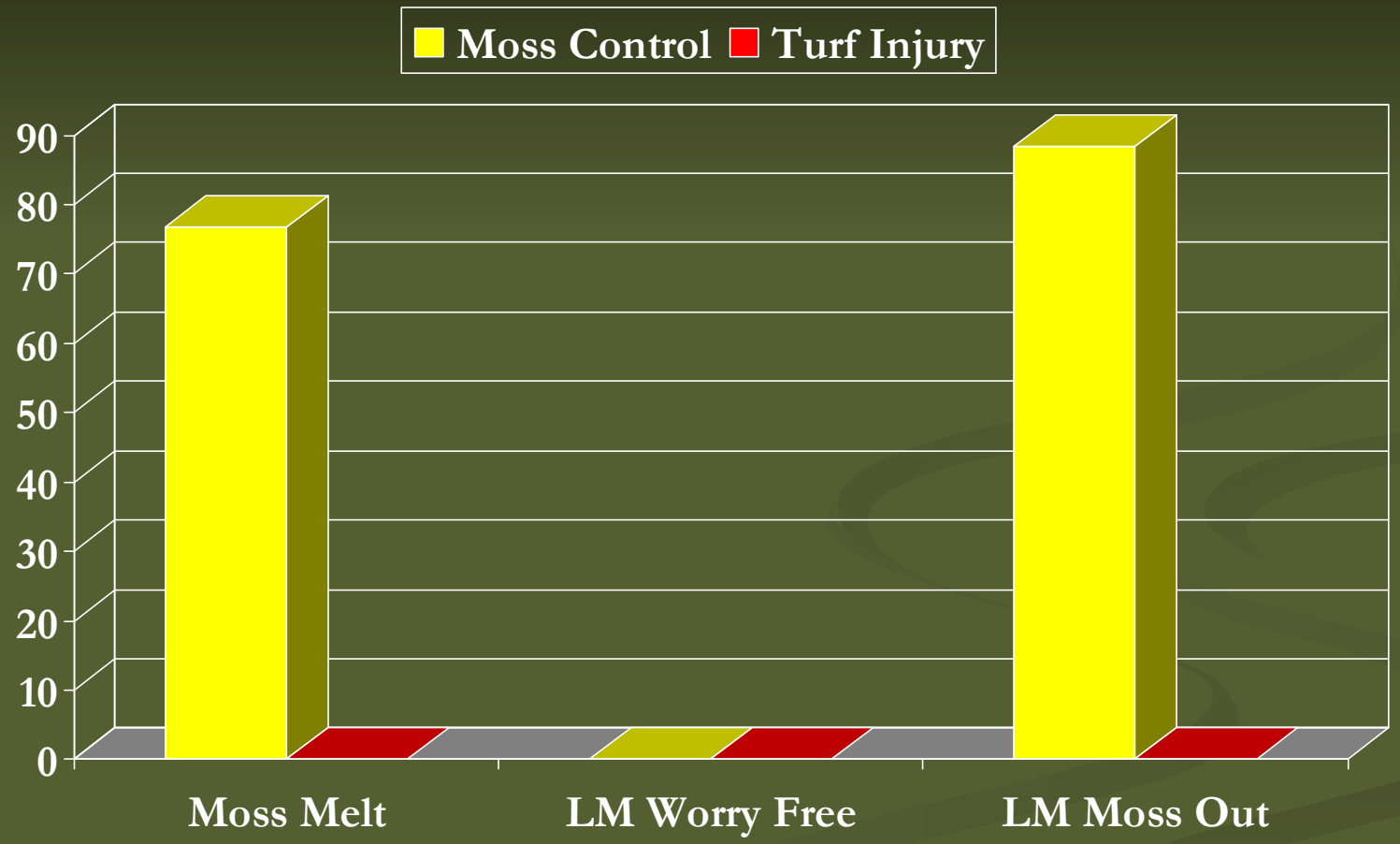



Ratings are from 0 to 100: 0 = no effect, 100 = total effect

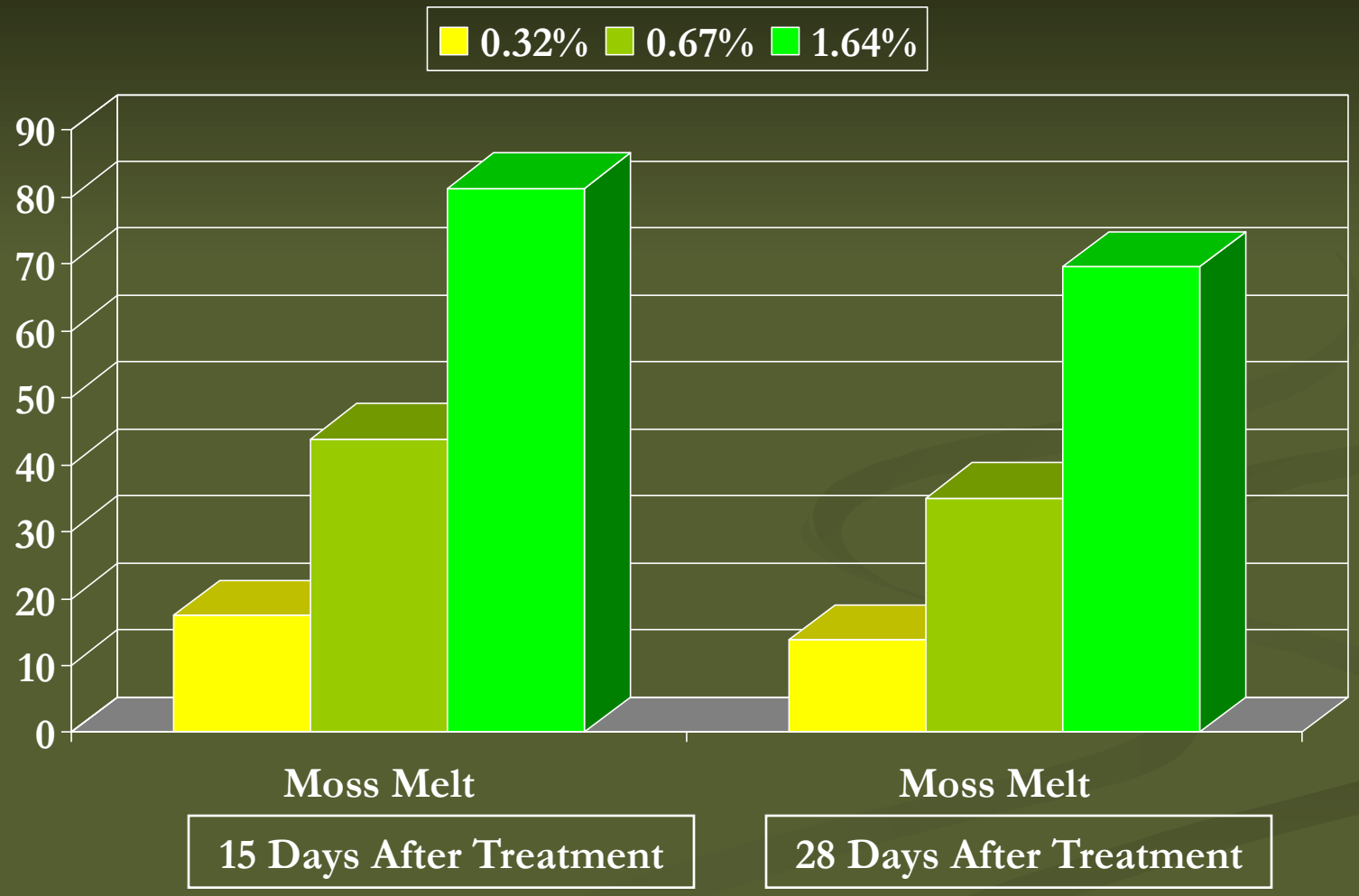
2.29 gal/1000 spray solution
TeeJet 1104 VS

# University of Massachusetts (UM) Trials
# Trial #2
# Greenhouse Trials - Moss Control

- Greenhouse trials were set up to determine why there were such difference between Moss Melt in the outdoor trials.
- The highest dose tested is equivalent to the 1X label rate
- No real differences were observed in the greenhouse trials

# **Moss Control:** Greenhouse Trial

**University of Massachusetts** - October, 2008




Dr. Prasanta Bhowmik, Dept. of Plant, Soil, and Insect Sciences.

*Note: 5% represents 1X dose rate.*

# 2008 Moss Trials – Conclusions (Slide 1 of 2)

- The Moss Melt
- Lilly Miller is the industry standard in terms of moss control and safety to turf.
- Garden Safe was typically efficacious, but quite phytotoxic to grass
- Worry Free Moss & Algae caused the least injury to grass but often had little effect on moss.
- In the cooler and higher temperatures of the PNW, Moss Melt was equivalent to LM Moss-Out in regards to turf safety. In the Northeast, Moss Melt sometimes caused some injury to turf.
- Regarding moss control, Moss Melt was often statistically equivalent to LM Moss-Out, but numerically less than Moss-Out

# Oregon State University (OSU) Trials
# Moss Control & Turf Phytotoxicity

by Dr. Tom Cook and Brian McDonald

- **3 sets of trials were conducted by OSU:**
  1. Trial #1: Rate trials for Moss Control and Phytoxicity with Moss Melt formulation – all applied by **backpack** sprays (Feb, 2008)
  2. Trial #2: Comparative trials between Moss Melt applied by **backpack** and **hose-sprayers** (May, 2008)
  3. Trial #3: High temperature phyto trials (Aug, 2008)
- **Response by the moss was fairly quick (< week):**
  - Data presented in slides will be evaluations at 2 weeks after treatment
- **Any turf injury showed up almost within 3 to 4 days:**
  - Data in following slides will be evaluations at 1 week treatment
- **Standards in all trials were:**
  1. Worry Moss & Algae **(15% sodium lauryl sulfate & 6% citric Acid)**
  2. Garden Safe Moss & Algae **(22% potassium soap of fatty acids)**
  3. Lilly Miller Moss-Out **( 9.75% ferric sulfate)**

# Trial #1

## Efficacy Rate Trial

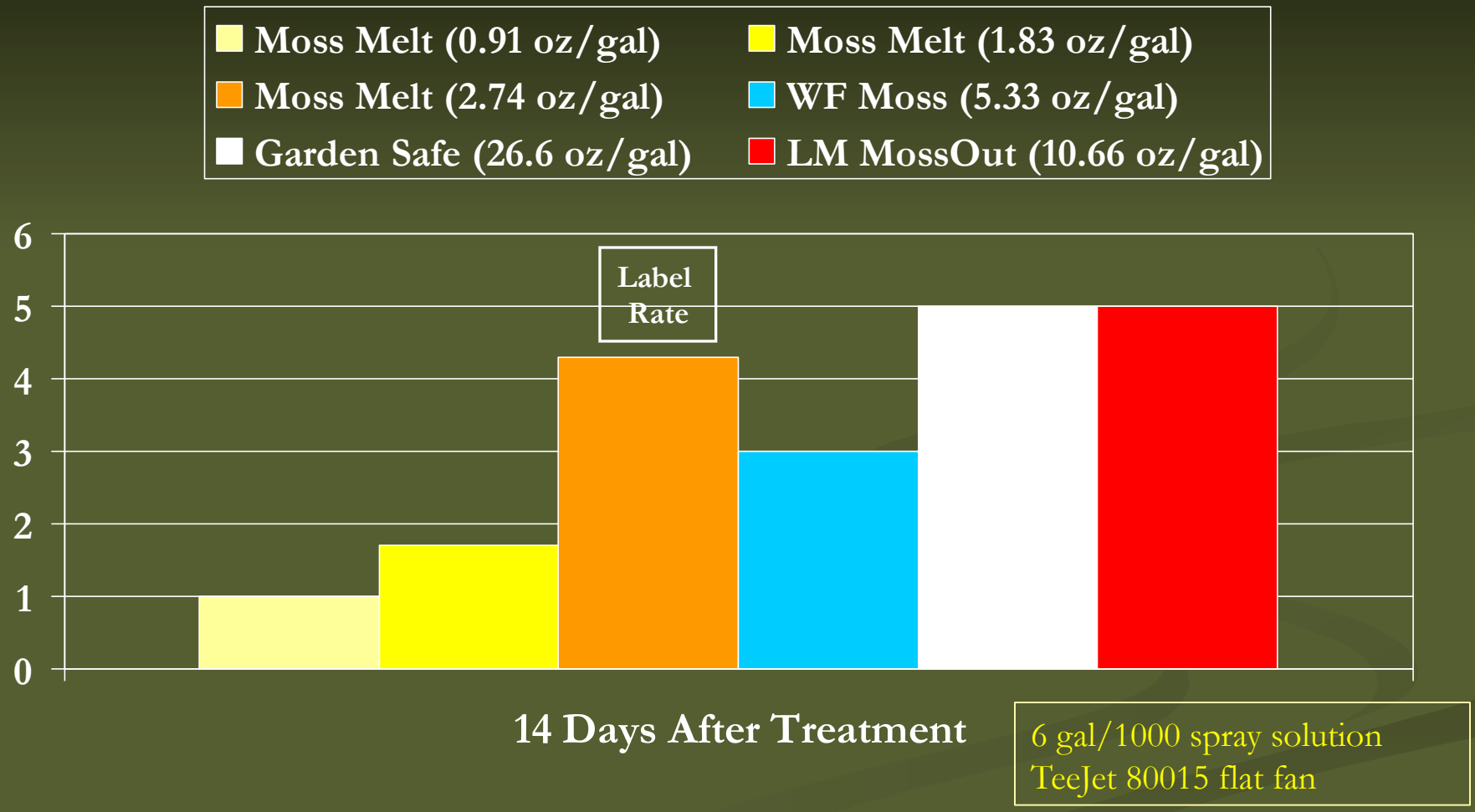
## Turf Injury Rate Trials

all applications by **backpack** sprayer (6 gallons/1000 sq.ft.) comparing **Moss Melt to other consumer products**

**Initiated February, 2008**

# #1 Moss Control – Rate Trials (Backpack)

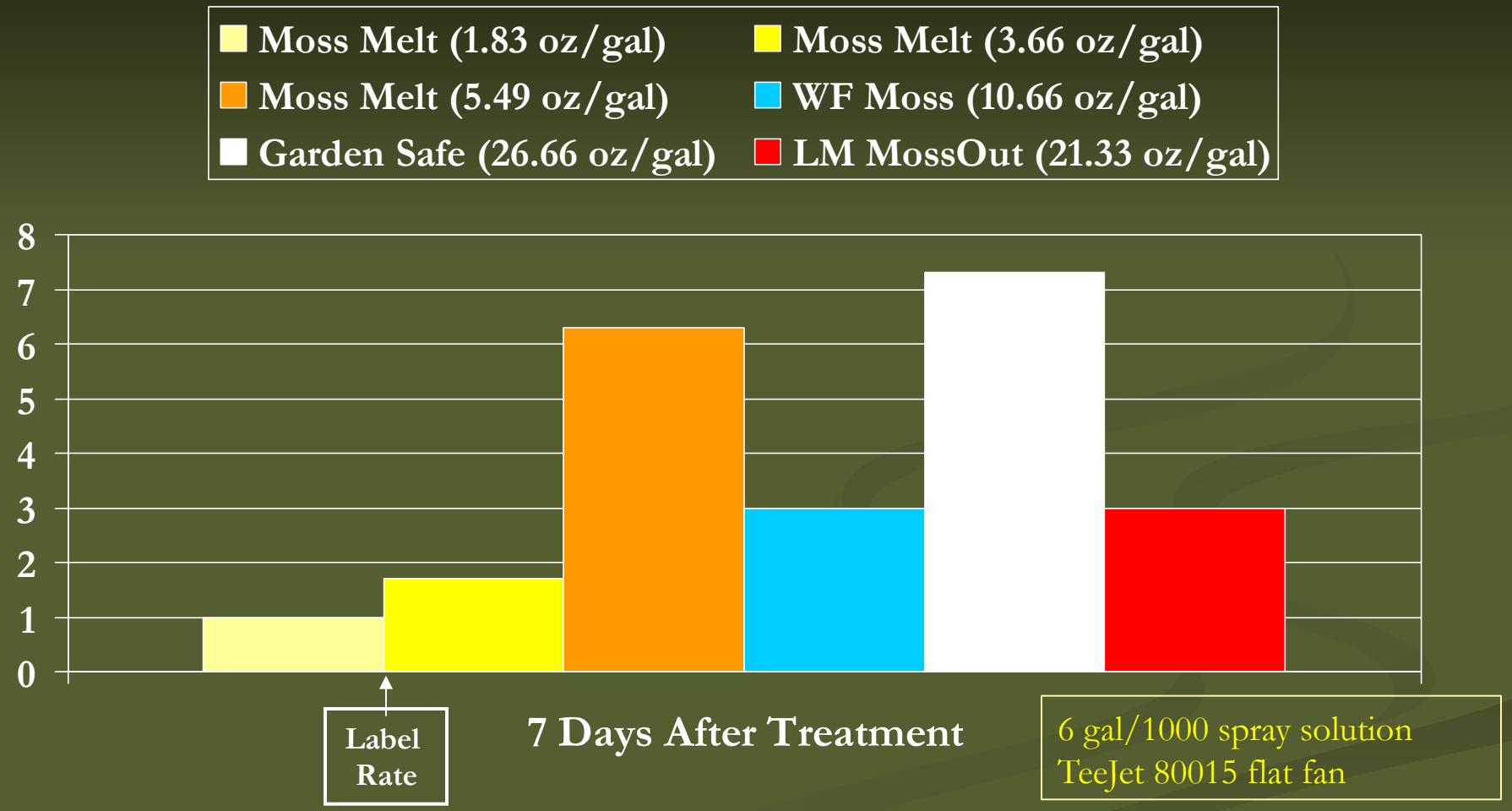
Oregon State University (OSU) Trials




*Note: WF Moss & Algae, Garden Safe and Lilly Miller Moss-Out applied at 1X label rate.*
*Ratings scale: 0 – 9 (1 = no effect; 9 = complete kill)*

# #1 Turf Phytotoxicity – Bentgrass Injury (Backpack)

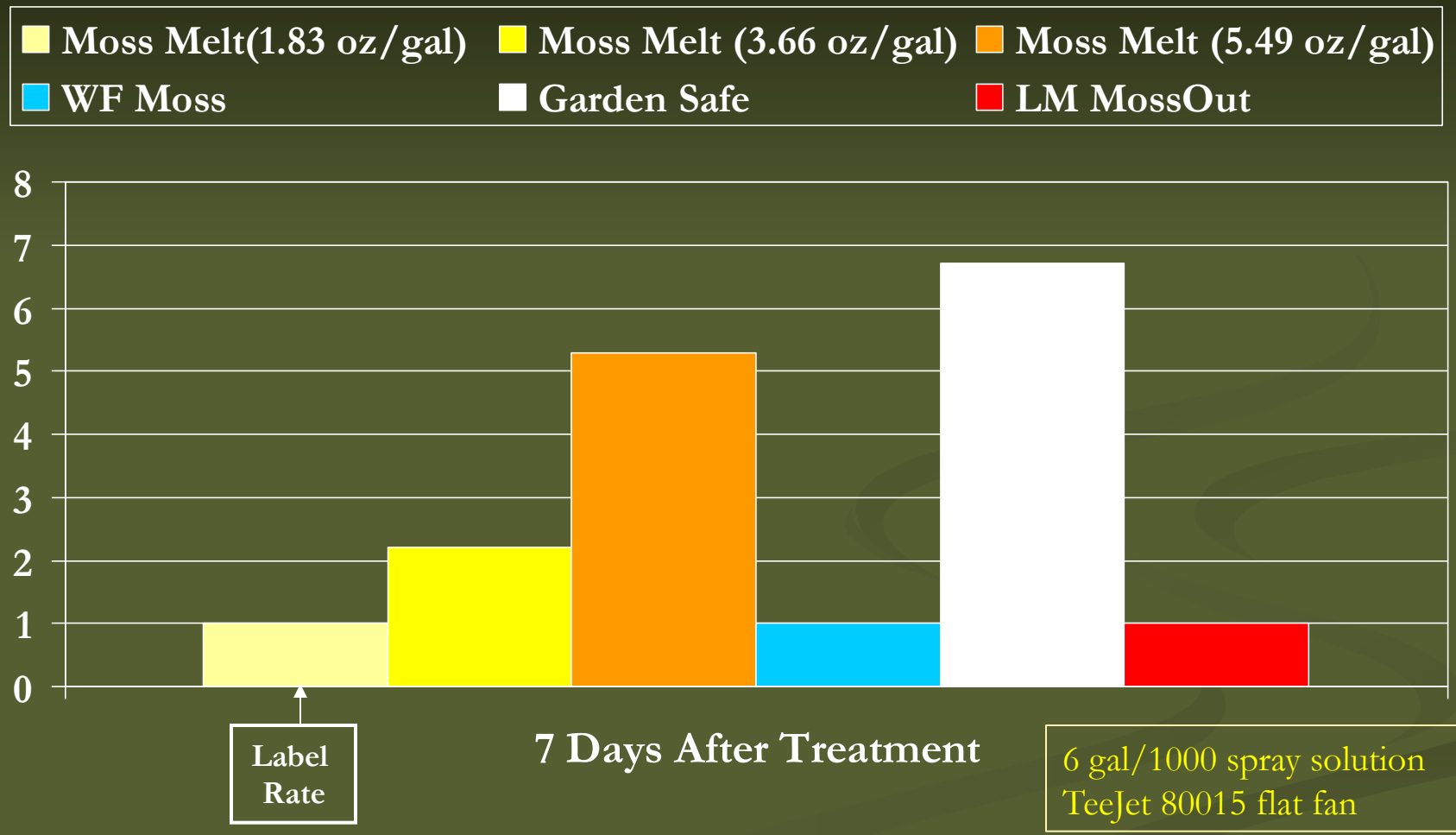
Oregon State University (OSU) Trials




*Note: WF Moss & Algae, Garden Safe and Lilly Miller Moss-Out applied at 1X label rate.*
*Ratings scale: 0 – 9 (1 = no effect; 9 = complete kill)*

# #1 Turf Phytotoxicity – P. annua & P. Rye Injury

(Backpack)

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# Moss Control & Turf Phytotoxicity (Backpack)
## Trial #1 Conclusions

- **Moss Control - Rate (efficacy) trials:**
  - Highest dose of Moss Melt (2.74 oz/gal) becomes label rate
  - Comparative efficacy at label rate:

  **Lilly Miller Moss-Out = Garden Safe > Moss-1 > WF Moss & Algae**
  - Moss Melt slightly less effective , but statistically similar to LM Moss-Out
- **Turf phytotoxicity trials:**
  - **Bentgrass:** Moss Melt label rate is safest, comparative phytotoxicity is:

  **Garden Safe >> WF Moss & Algae > Lilly Miller Moss-Out > Moss Melt**
  - **Poa annua & Perennial Rye:** WF and LM no effect, but Moss Melt minimal damage

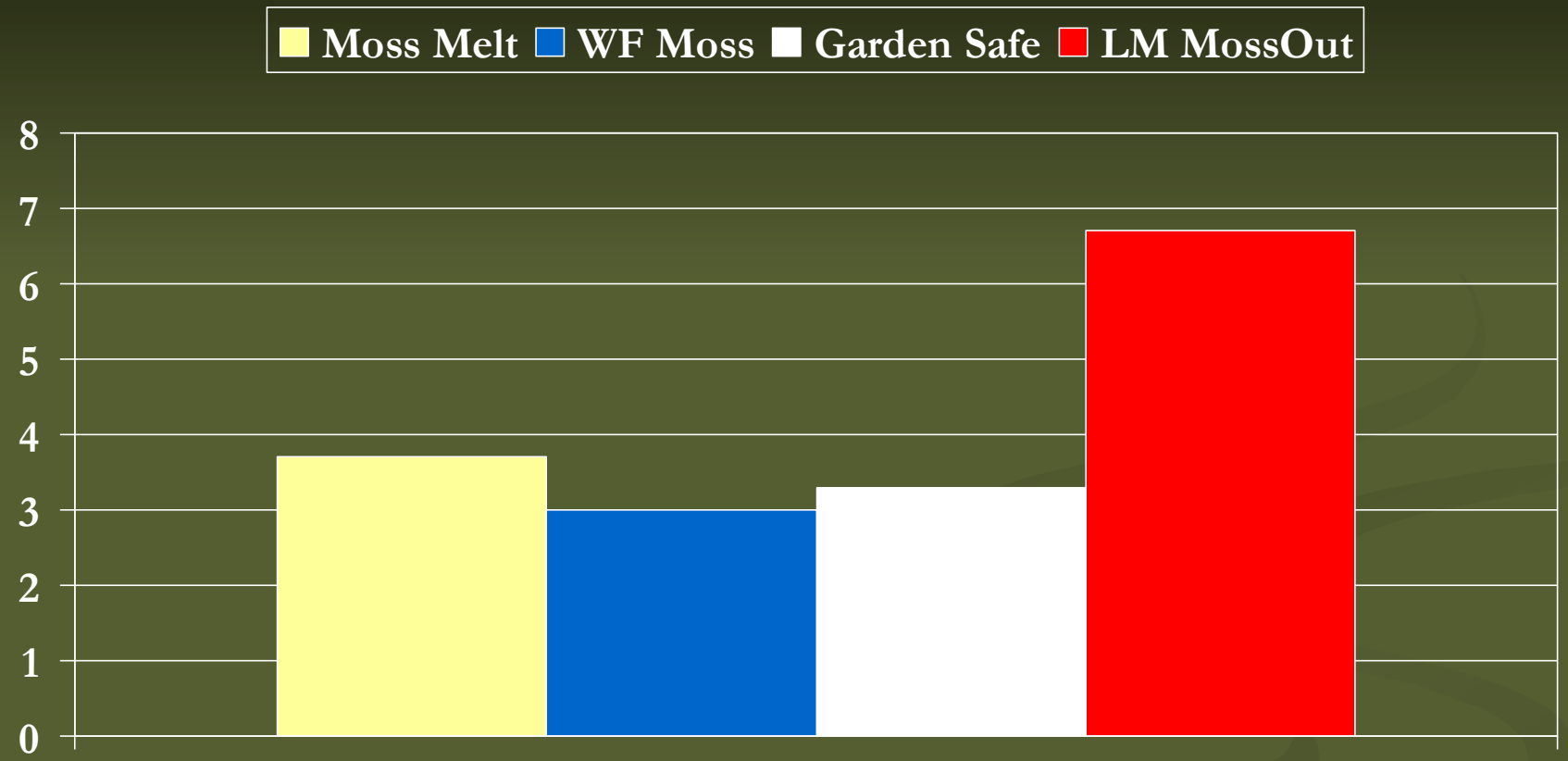
  **Garden Safe >> Moss-1 > WF Moss & Algae = Lilly Miller Moss-Out**

# Trial #2
# Efficacy Rate Trial
# Turf Injury Rate Trials
# backpack and hose-end sprayer

**Initiated May, 2008**

# #2 Moss Control – Efficacy Trials (Backpack)

Oregon State University (OSU) Trials

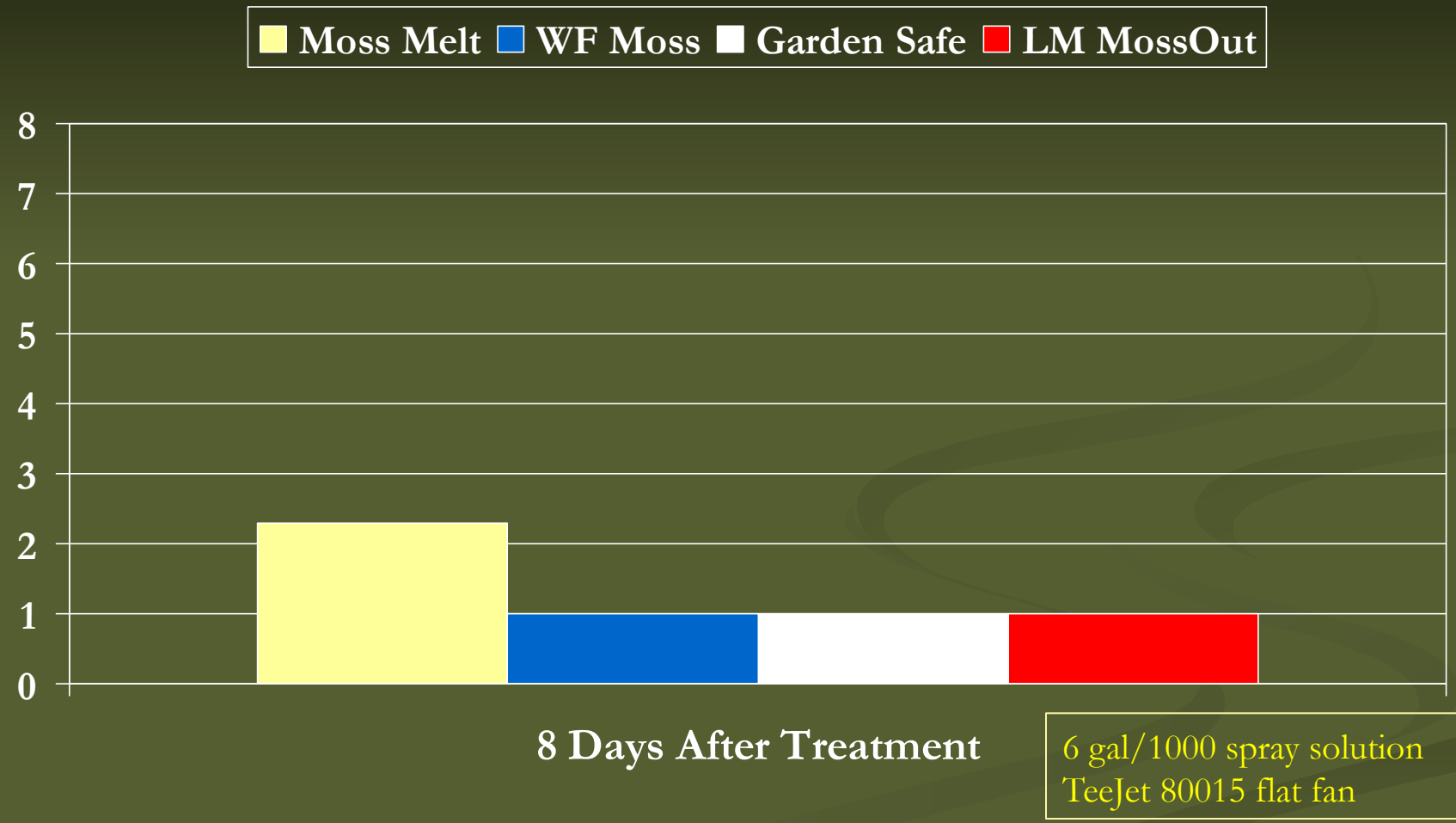



6 gal/1000 spray solution
TeeJet 80015 flat fan

*Note: WF Moss & Algae, Garden Safe and Lilly Miller Moss-Out applied at 1X label rate.*
*Ratings scale: 0 – 9 (1 = no effect; 9 = complete kill)*

# #2 Turf Phytotoxicity – P. rye, P. annua, P. trivialis, and bentgrass (Backpack)

Oregon State University (OSU) Trials

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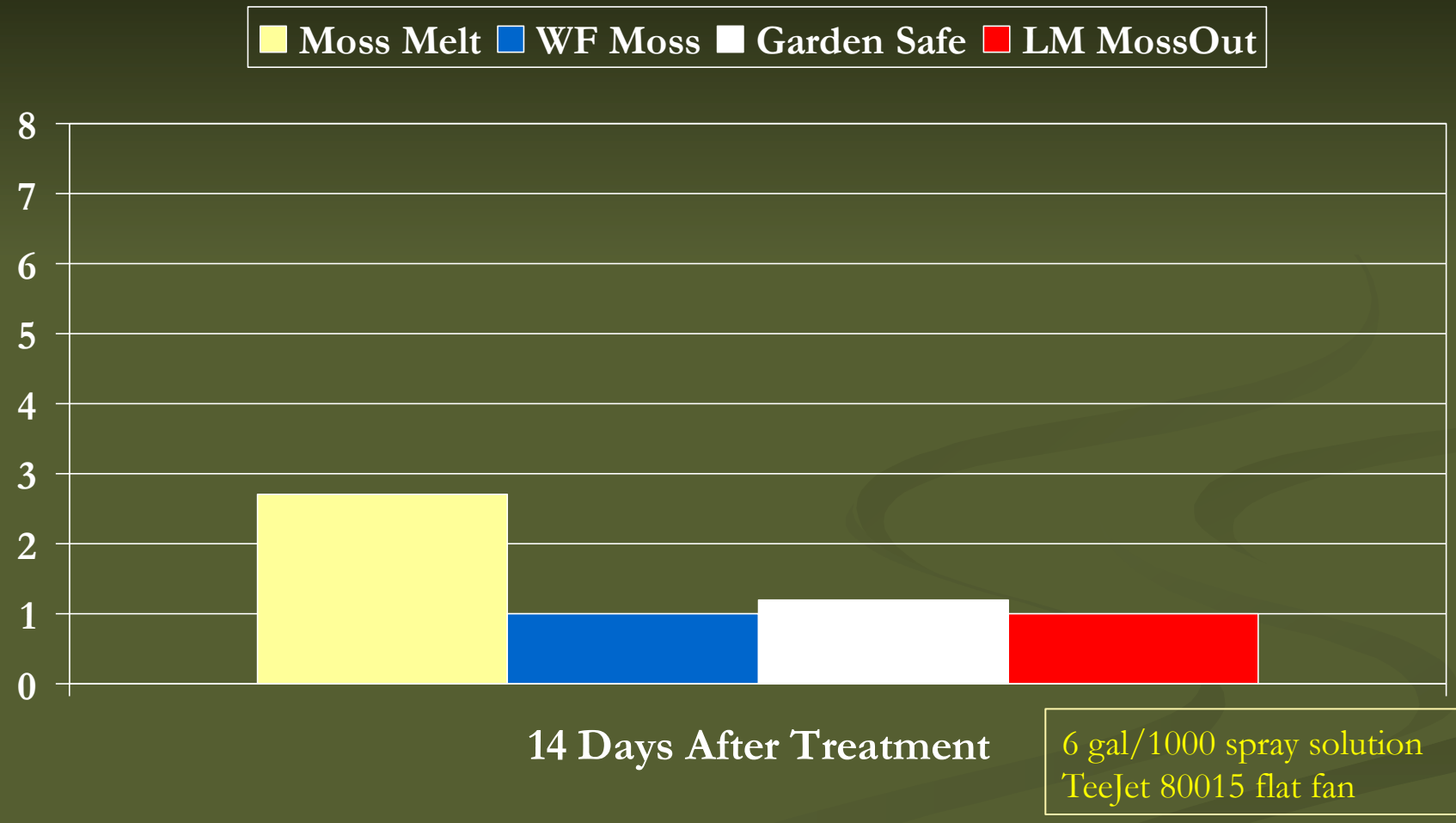
Oregon State University (OSU) Trials




*Note: WF Moss & Algae, Garden Safe and Lilly Miller Moss-Out applied at 1X label rate.*
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# Trial #3

# Turf Injury Rate Trials at High Temps

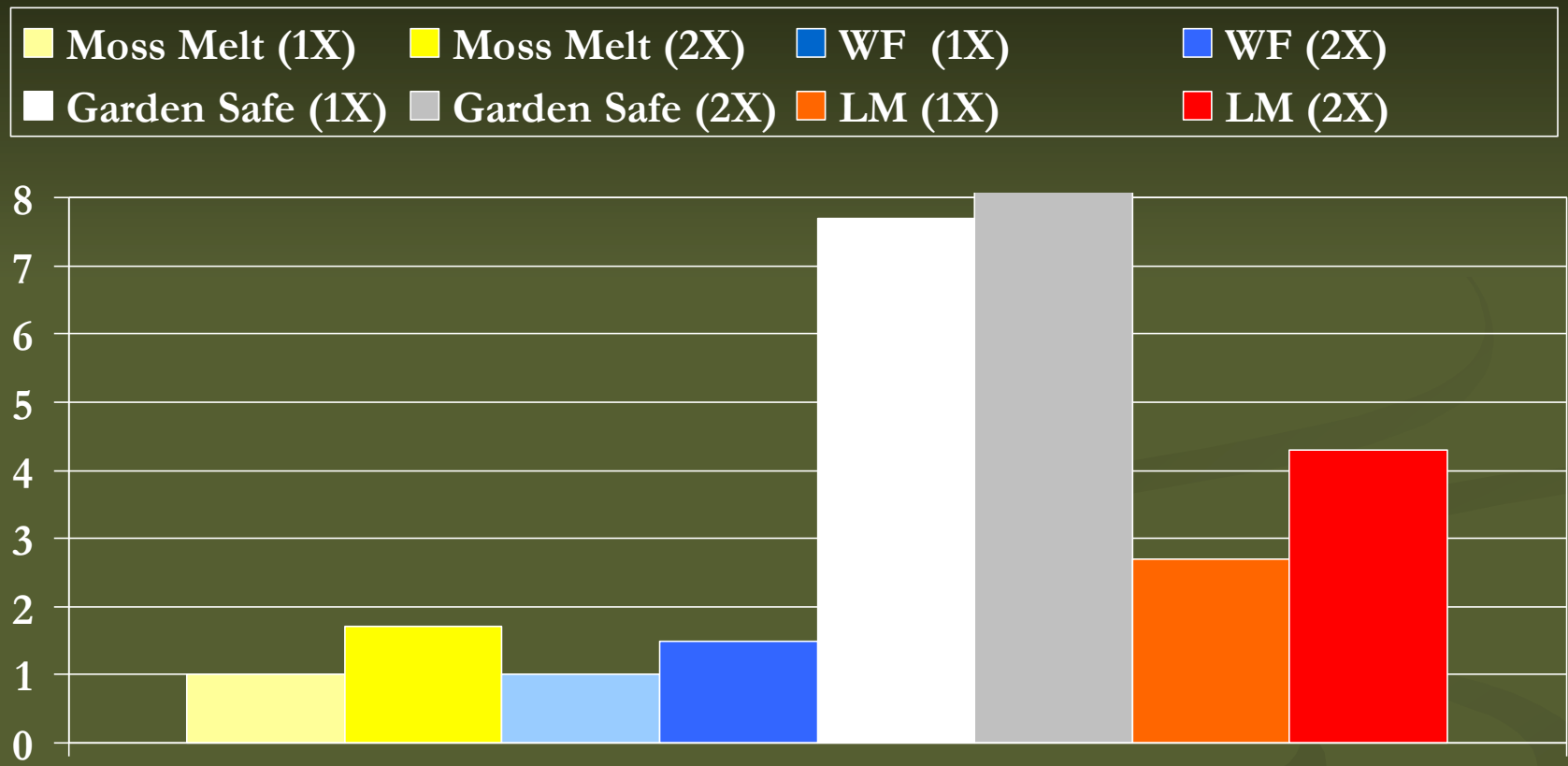
## backpack sprayer

## Moss Melt vs. Standards

Initiated August, 2008

# #2 Turf Phytotoxicity – P. rye, P. annua, P. trivialis, and bentgrass (Backpack)

Oregon State University (OSU) Trials




6 gal/1000 spray solution
TeeJet 80015 flat fan

*Note: WF Moss & Algae, Garden Safe and Lilly Miller Moss-Out applied at 1X label rate.*
*Ratings scale: 0 – 9 (1 = no effect; 9 = complete kill)*

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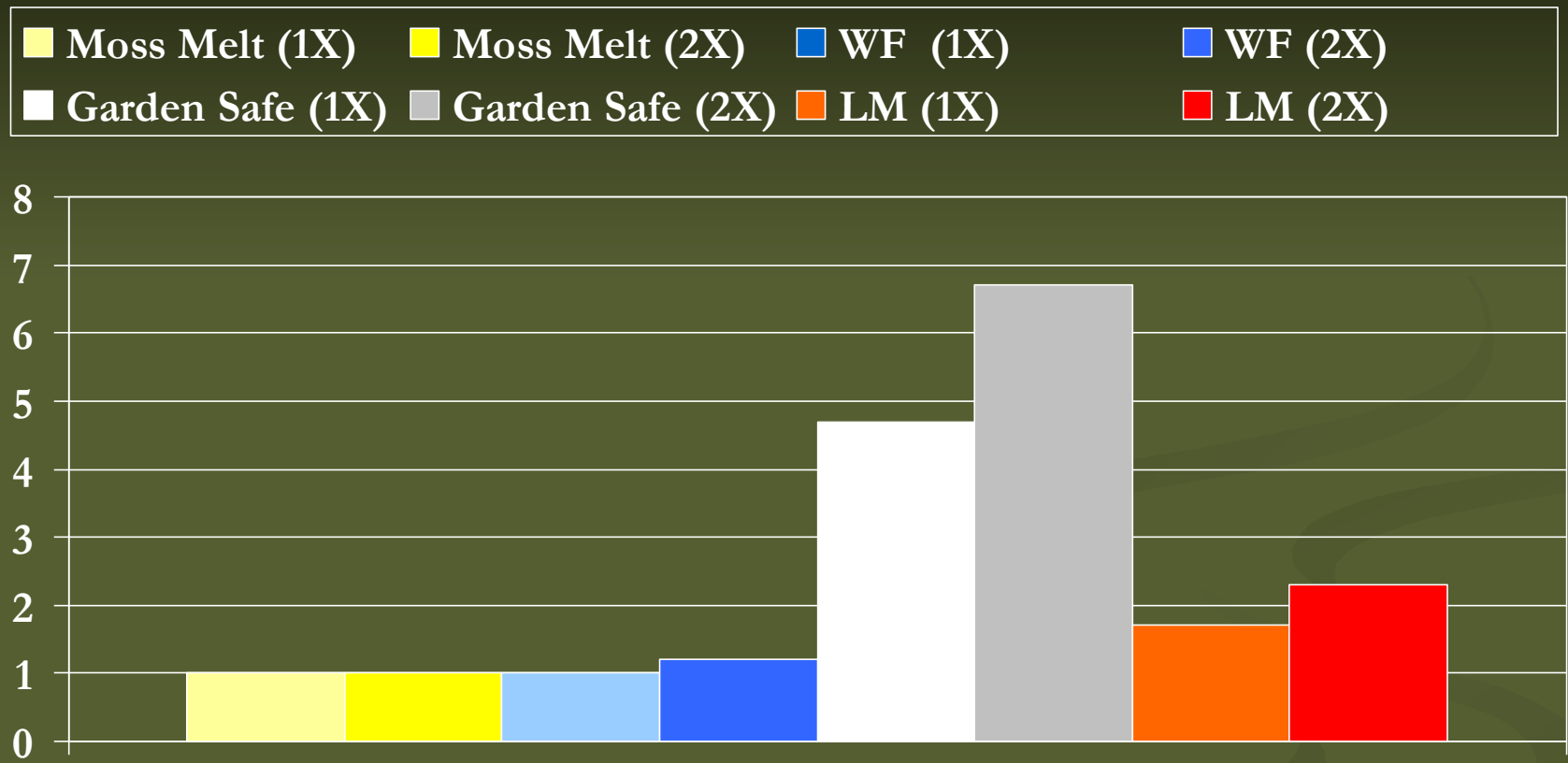
Oregon State University (OSU) Trials




6 gal/1000 spray solution
TeeJet 80015 flat fan

*Note: WF Moss & Algae, Garden Safe and Lilly Miller Moss-Out applied at 1X label rate.*
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# OSU Turf Phytotoxicity
## Trial #3 Conclusions

- **All Applications went out at 1X and 2X label rate**
- **Temperatures before and after spraying:**
  - 3 days before: 74, 72 and 79
  - Day of treatment: 85
  - 2 days after treatment: 83 and 88
- **No injury with Moss Melt or WF Moss & Algae**
- **Garden Safe had considerable injury with the 1X and 2X rates**
- **Lilly Miller Moss-Out had some injury with the 1X and 2X rates**
- **** Late summer grasses have hardened off**