DLC STAKEHOLDER MEETING 2018

July 9 - 11 • Boston, MA

Discussion Session:
Horticultural Requirements

Facilitators

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Agenda

- Introductions
- Overview of DLC Intent, Status of Spec, Development Process
- Highlights of Key Issues in Draft 1 Comment Period
- Discussion on Specific Items
- Open Discussion
- Review of Next Steps

Statement of intent

With this specification effort, DLC's intent is to:

- Ensure a basic floor for energy-consumption performance for LED-based horticultural lighting products at a high-volume, mass-market scale.
- Standardize measurements of output, to allow for fair comparison of product for all horticultural uses.
- Make minimal needed prescriptive requirements outside these two goals, acknowledging the rapid state of change underway.
- Communicate a multi-year trajectory, in both the current specification's categories, and potential categories to be established later.

Important Dates

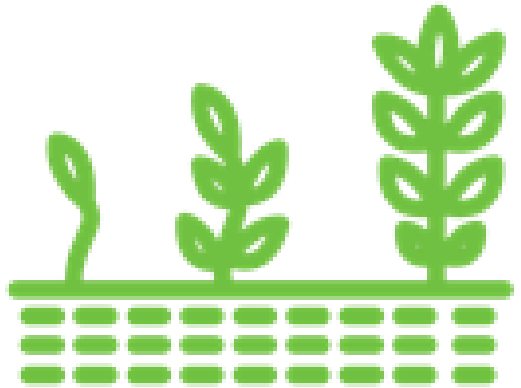
Overview Topics

Short List of Comment Topics

- Spectrum Considerations
- Testing Challenges
- Efficacy Thresholds
- LED Longevity
- Driver Longevity
- Fan Longevity
- Products with External Cooling
- Fixture classification
- QPL Display/Listing Requirements
- Multi-channel testing/spectral tuning
- Safety Certification
- Family Grouping
- DC/PoE/Remote Drivers
- Non-LED products
- Retrofit Kits and Lamps
- Warranty Considerations
- PPFD Mapping
- Premium Requirements…

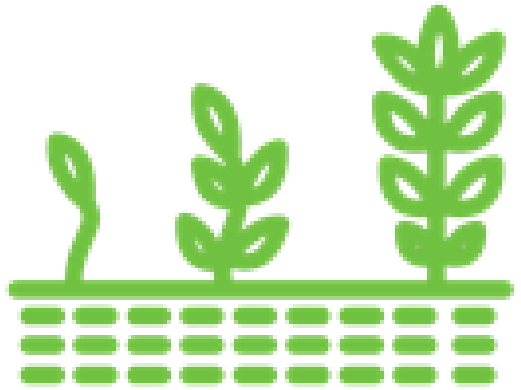
Closing In On Draft 2!

- Spectrum
  - A note on standards! (ASABE S640… more coming)
  - 400-700 nm will be the key threshold spectrum
  - The QPL will *report* a verified 700-800 nm (“far red”) value for informational use, but will not count for threshold
  - Additional reported fields: 400-700, with 400-499, 500-599, 600-700, 701-800 sub-bins also provided
- Testing challenges: UV
  - Technical challenges (reflectance, absorption, detailed study on equipment/impact on equipment)
  - Market challenges (where equipment may exist, cost challenges)
  - “Infrastructure” challenges (calibrated sources, accreditation)
  - Most concern: wavelengths <350nm
  - But, matching with standards definitions, functionally challenges reporting the defined bands <400nm



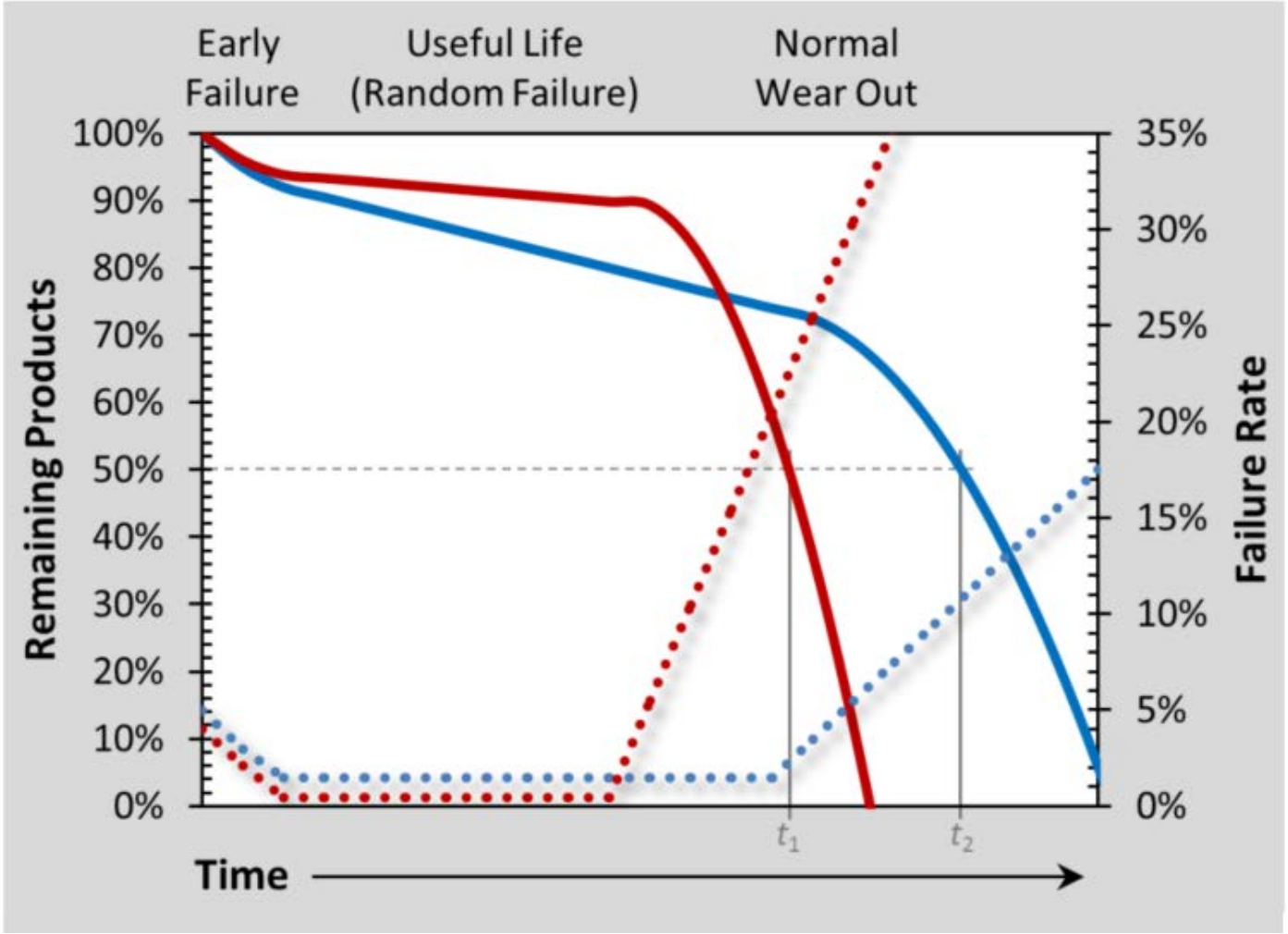
Closing In On Draft 2!

- Spectrum
  - Manufacturers: what portions of the ASABE 280-400nm UV range are you targeting for UV emission?
  - Manufacturers/labs: what are you doing to accurately characterize the performance of products
  - *Future intent: declare desire to expand **reported** sub-400nm values as testing is standardized.*
  - *Future intent: declare willingness to consider all or some of the 700-800nm band for efficacy and thresholds if consensus-based standards evolve.*
  - *Future intent: declare willingness to set % minimum thresholds for each bin based on application, if consensus-based standards evolve.*
- Efficacy
  - Settling near ~1.8 µmol/J, for the 400-700nm (PAR) range for next draft
    - Difficulty in getting detailed whole-system data, especially for ballasts and reflectors.



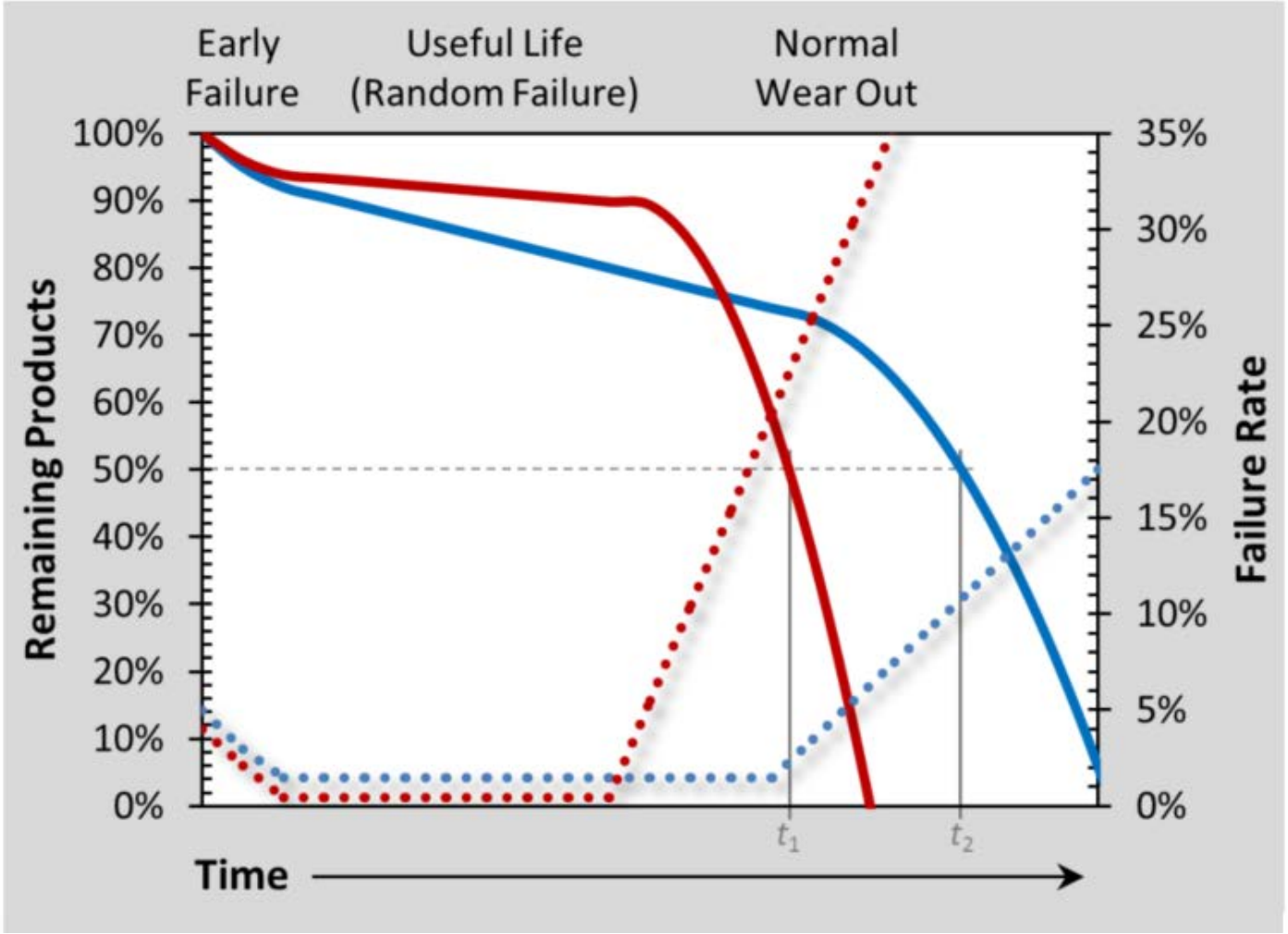
Closing In On Draft 2!

- Longevity - driver
  - "Rated lifetime" of the driver will be evaluated at the driver measured operating temp during ISTMT
  - Ambient temp during ISTMT must be consistent with fixtures ambient temperature rating
  - Lifetime claims and ISTMT temp must be consistent with at least 50,000 hours.
  - **If you are familiar with SSL, the ambient temperature requirements are more specific**



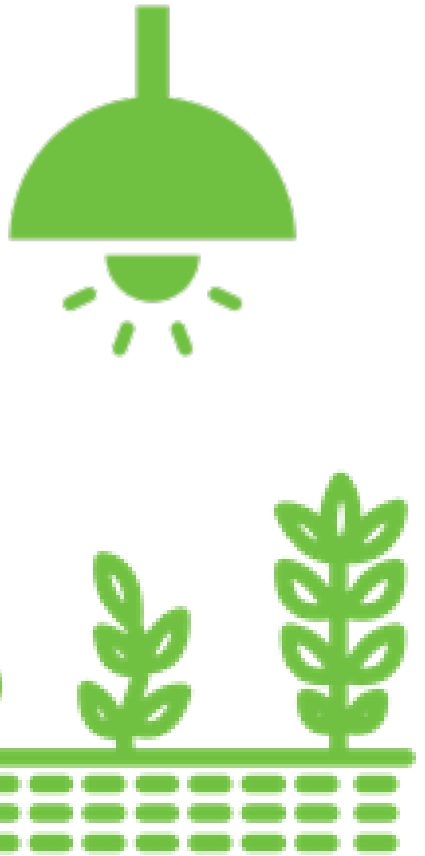
Closing In On Draft 2!

- Longevity - fan
  - "Rated lifetime" of the fan will be evaluated at the fixture's upper spec sheet temp limit, with fan-manufacturer-provided data.
  - Rated lifetime must be ≥50,000 hours
  - Fixture rated ambient must be consistent with fan rated ambient
  - There is no ISTMT for this measurement.



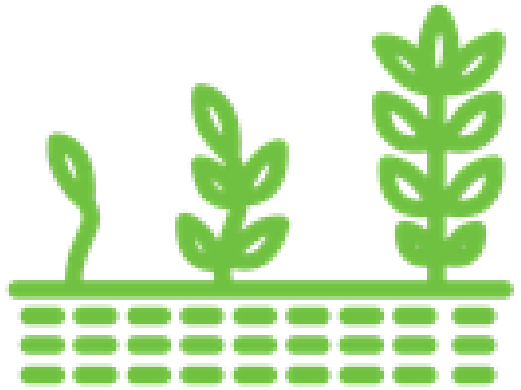
Closing In On Draft 2!

- External cooling remains excluded
  - Any active cooling other than an internally-housed and fixture-powered air-moving fan is not eligible for the DLC Hort QPL.
  - *Future intent: when ASABE ES-311 completes recommended testing procedures for these products, and testing labs are accredited to reliably carry out these procedures, DLC intends to add them to its QPL in the next revision. A fair method of accounting for energy consumption by these active means must be specified.*



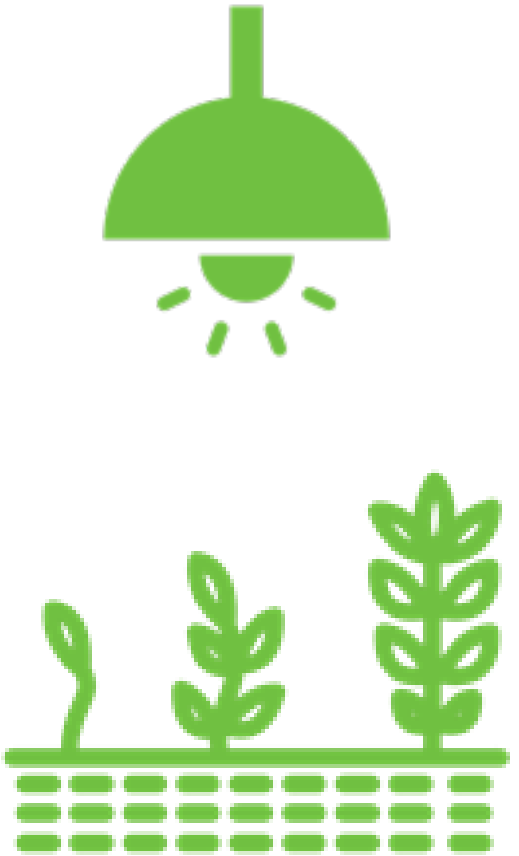
Closing In On Draft 2!

- Fixture classification collapses to a single category
  - For now! We'll analyze QPL data for future revisions. There's just not enough data out there yet to make hard distinctions.
  - DLC will ask applicants to specify intended use to build a data set that it will use for researching future versions.
  - *Future intent: DLC will analyze the distribution of reported intended use of products to determine appropriate classifications (and requirements therein) in future versions.*



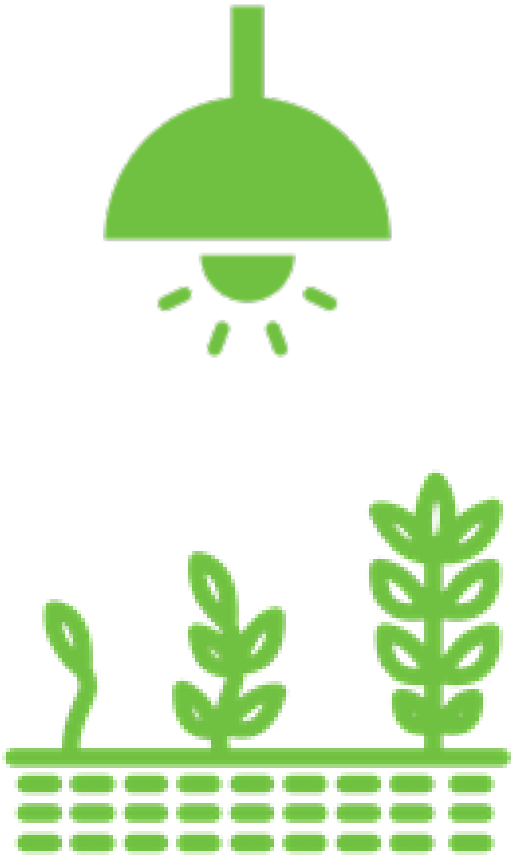
Closing In On Draft 2!

- Safety Certification
  - Certification by an OSHA-recognized NRTL OR an SCC recognized safety body to their internal requirements for horticultural lighting, will be required of all products.
  - In the absence of a formal hort-specific standard, DLC defers to the judgement of the recognized safety bodies when it comes to questions of safety. Will allow each appropriate body to use its own method.
  - *Future intent: When an ANSI-approved horticultural lighting safety standard is finalized, DLC will specifically require it of all products. For example, if UL-8800 completes the ANSI process, it will become the single safety requirement.*



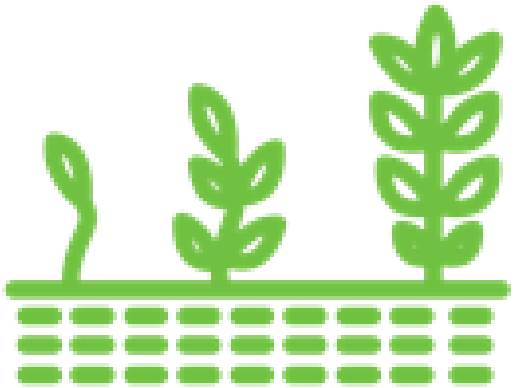
Closing In On Draft 2!

- DC / PoE and remote drivers
  - DC/PoE electrical power architectures are excluded from the QPL.
  - *Future intent: DLC will monitor the progress of the general illumination DC/PoE specification, and consider opening the horticultural category to this topology in the second round based on stakeholder feedback.*
  - Remote drivers, matched on a 1:1 basis with fixtures, are allowed if test reports show that the remote drivers are in the same environmental and electrical test conditions as their fixtures.



Closing In On Draft 2!

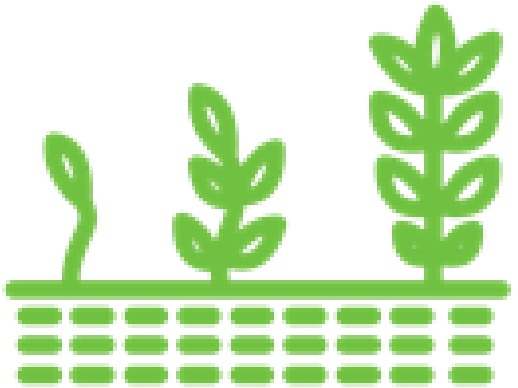
- Miscellaneous
  - Non-LED products not eligible.
  - Lamps and retrofit kits not eligible in the first version, will consider adding them in future revisions.
  - DLC is making a general horticultural application. Crop-specific metrics intriguing, but complexity and standardization concerns.
  - PPFD / mapping specificity not yet standardized sufficiently to require. May write application notes to help guide users in their use of PPID data files for these products, though. Engaged in standardization efforts.
  - Max rated temperature must be on the product's spec sheet, will include in QPL listing information.
  - DLC will monitor and participate in labeling efforts, may require a standardized label spec sheets on spec sheets in future.



Discussion Topics

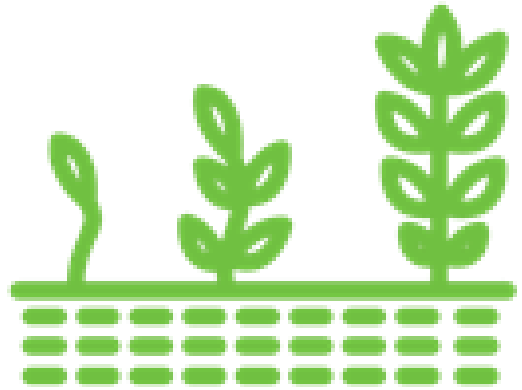
LED Longevity

- Longevity - LED
  - Either LM-80/TM-21 or LM-84/TM-28 will suffice for flux degradation
  - LED ISTMT must be conducted in an ambient temp that is equal to the highest temp on the spec sheet
  - Q_{90} threshold in the 400-700 nm band of 36,000 hours ("PPF Q_{90}")
  - DLC will report on the 701-800 Q_{90} as well.
  - *Future intent: ex-PAR Q90 may be reported or required if measurement and consensus standards evolve, in either the far-red or UV ranges.*



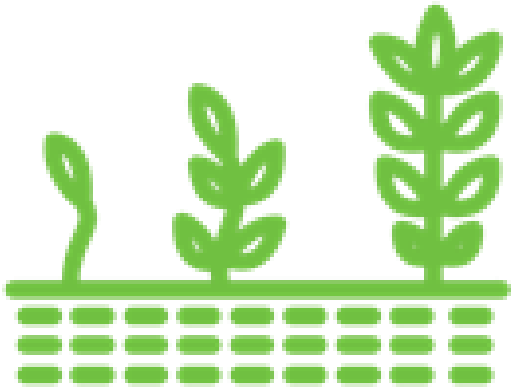
Discussion Topic: LED Longevity

- Issue: if a LED manufacturer doesn't have LM-80 data yet, is there a provisional way to qualify?
- Discussion urged by practical considerations of market and urgency in need for qualified products.
- Appropriate consideration needs to be given around certainty in performance.
- Options?
  - Allow grace period without data?
  - If some data exists, but in different format?
  - Evaluate through some form of a static conversion factor from existing lumen- or power-based data? (Require additional testing?)
  - If allowed, do we flag provisionally qualified products?
- Draft 2 will have clear signal: long-term performance data **will be needed.**



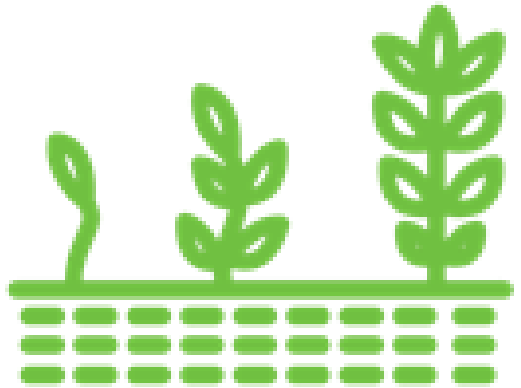
Multi-channel (tunable) Testing

- Multi-channel testing
  - Single-channel test states and reporting did not elicit controversy, and will be carried out for 400-700nm and 700-800nm.
  - “All on” is more difficult, given the varying ways manufacturers build.
  - Details on component performance (spec sheet) and control/drive current approach to each setting must be provided for evaluation purposes



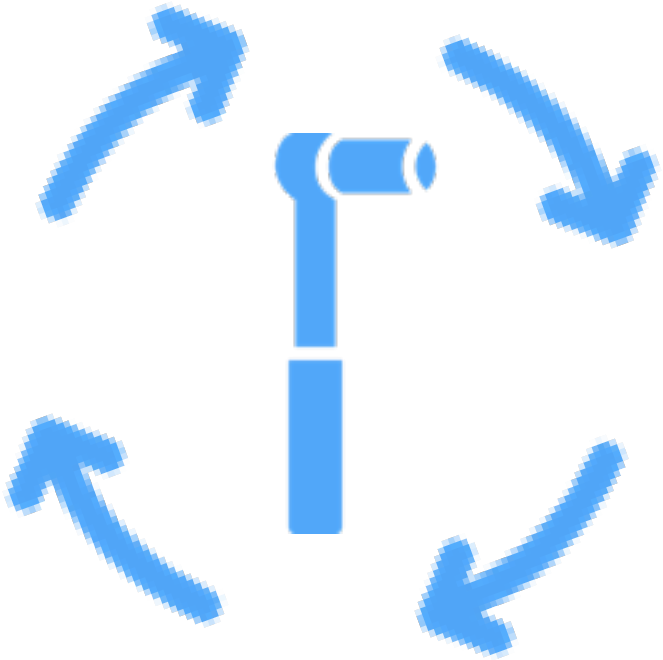
Multi-channel (tunable) Testing

- Multi-channel: All-on, how to specify test?
- Pre-disposition: select a «typical» setting, allowing manufacturers to self-declare?
  - Risk of gaming?
  - Need to communicate setting?
  - Need to communicate performance in alternate settings?
  - Concern normally about «Worst-Case»…
- Challenge on worst-case
  - How to determine?
  - What if includes dedicated non-PAR channel?



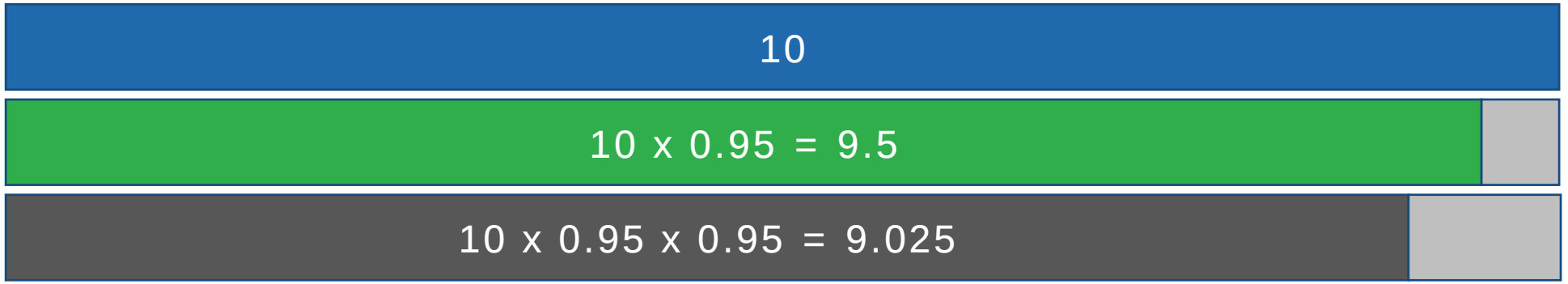
Revision Cycle

- DLC is considering a 12-18-month revision cycle.
- First revision should likely be targeted at 12 months, given state of change in standards, etc. Revision cycle thereafter TBD.
- DLC is considering limiting the qualification of a product to two years, to control “ghost products” populating the product list while not being commercially available.
  - Year 1: Hi, are you still selling this product? Please log in and click “confirm”.
  - Year 2: Hi, are you still selling this product? Please re-apply.
- When revising, what are good efficacy “ratchets” to refer to?



Tolerances

- Efficacy is going to be the major threshold variable
- What is within the reasonable uncertainty window of professional testing labs?
  - PAR for now
  - Potential for beyond-PAR if testing procedures improve



Surveillance Testing

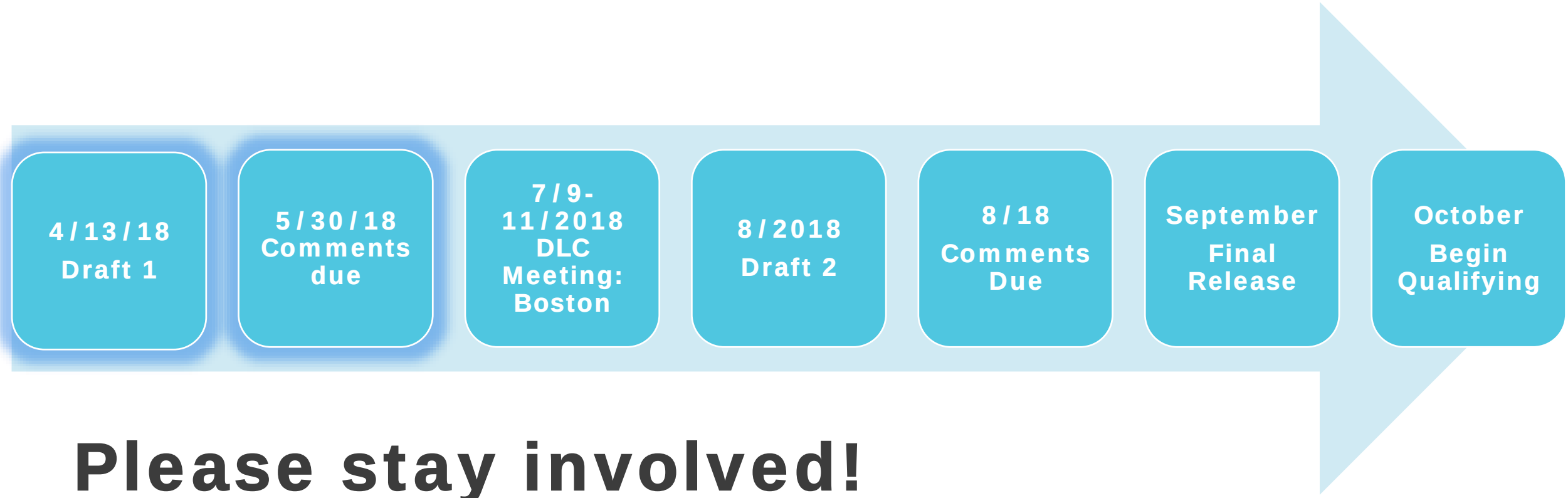
- DLC's sample-and-test surveillance program for general illumination products will run for horticultural fixtures.
- Tolerances matter for this!
  - Are *all* labs able to test the same product within the tolerance band?
- What are useful filters to guide the sampling selection?
  - Extremely close to threshold?

Open Discussion

Open Discussion Notes

- (To be added)

Reminder! Important Dates



Please stay involved!

Questions?

General Contact Information

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