

RHODE ISLAND CANNABIS PRODUCTION ISP REPORT

DNV carried out this study to define industry standard practice (ISP) in RI for cannabis industry end-uses, including horticultural lighting, lighting controls, cultivation area HVAC, HVAC controls, and dehumidification, using in-depth interviews of contractors and service providers who have operated in the state.

Approach

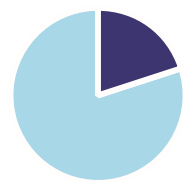


Key findings

Horticultural lighting results: Some market actors indicated facilities may install different options for different types of cultivation areas. While such responses were seen for the flowering areas, for all other types of cultivation areas, LEDs were standard practice.

For lighting controls, most respondents said that simple strategies deploying timers are typically used for the different cultivation areas, otherwise, sites perform manual switching. If dimming is installed, it is primarily to reduce shock on plants when going between growth phases, especially in dual-use rooms when the room changes to a different phase of growth.

Dehumidification results:



20% of respondents used direct install units for dehumidification

80% of respondents used portable units for dehumidification

Conclusions

Horticultural lighting

Lighting designs in Rhode Island typically revolve around set Photosynthetic Photon Flux Density (PPFD) targets by the owner. Lighting ISPs by stage of growth are:

- **Flower/bloom:** 830-watt mixed LED and HPS technology (1,000-watt double-ended HPS or 660-watt LED), with a target PPFD of 900 and a photoperiod of 12 hours.
- **Vegetative:** 400-watt LED, with a target PPFD of 450 and a photoperiod of 18 hours.
- **Clone/seedling:** 200-watt LED, with a target PPFD of 200 and a photoperiod of 24 hours.
- **Mother:** 350-watt LED, with a target PPFD of 600 and a photoperiod of 18 hours.

HVAC results: The responses to the questions on HVAC ISP were consistent and primarily revolved around packaged and split direct expansion (DX) systems.

Environmental conditioning

The sizing of HVAC systems should be based on the anticipated sensible and latent loads for the facility using site-specific load calculations. There are both a substantial sensible load from the horticultural lights and large latent loads from the transpiration of plants, which release moisture that must be removed from the space to maintain environmental targets. Managing these loads contributes to high cooling and dehumidification use. The team found direct expansion systems to be the ISP for all facility sizes.

Recommendations

Use the identified ISP for baseline

The team recommends the use of the ISP practices identified in this study by implementors as the baselines for projects and by evaluators when evaluating those projects. For all systems and equipment where an ISP was not identified, a site-specific baseline should be used.

Future research

During the writing of this report, Rhode Island legislators legalized recreational cannabis for adult use. Most market actors who participated in the survey effort indicated that RI practices are typically not as sophisticated as other jurisdictions, but they expect this to change now that recreational use is legalized. As capital increases for these facilities, owners may pursue more sophisticated options for systems and controls. The cannabis landscape in RI will likely evolve in the coming years. The PA should consider revisiting this study later to research the adapting landscape and adjust ever-evolving ISP.

