

4/30/2025

The Industry's Role in Preparing Employees

Dr. Gene Giacomelli

I spoke with several employers within the CEA industry to gain their knowledge and add to my experiences with hiring new employees. The task of finding the perfect new employee can be challenging, frustrating and time-consuming! I found it rewarding to have hired hundreds of hourly students for my research and demonstration projects. Most have successfully gained experiences in plant production, climate and nutrient controls, and jobs in CEA.

A clearly defined job description and performance expectations by their manager or advisor is necessary. However, it's sometimes overlooked or misunderstood given the excitement of the opportunity by the potential employee. Knowing the job demands and its position within the organization contribute to job satisfaction and employee appreciation.

Most employers would claim that experience, as well as situational awareness, followed by capability to problem-solve, as the most critical attributes of their employees. Experience is knowing CEA production practices, but also adapting to the job procedures within the new system. An awareness is to recognize off-nominal conditions for the plants and the greenhouse systems. The perspective by the employee to correctly estimate the seriousness of a problem and to provide timely contact with others for problem resolution is highly desirable. Which brings the discussion to communications, without which there is no effective flow of crucial information.

A great mechanism to determine such employee attributes is with internship opportunities. These can lead to employment after an extended observation of a potential future employee. A summer job between semesters offers work experiences and some funds for the student, while exploring a new location and establishing a lifestyle away from their original home.

An alternative to lacking previous CEA experience is an advanced college education, such as a master's degree from an Applied Science program. With good mentoring (that's collaborating, but not overreaching) graduates can arrive with independent thinking, creativeness and the experience of an advanced academic degree by learning time management, organization and communication with written reports, oral presentations and team efforts.

Additionally, the multiple benefits from an established CEA-focused science program would include understanding applied basic CEA plant science knowledge, monitoring plant and environmental data, and

utilizing them both for effective management of optimal plant conditions and quality growth. However, a combined CEA Science/Technology/Engineering program of study would also include an understanding of hardware systems for climate and root zone control, and generally comfort with hands-on solutions to mechanical problems.

However, don't discount applicants with a Bachelor of Science degree. Many have completed internships at commercial production facilities or were responsible for plant care, evaluation and management on campus greenhouse crops projects. Generally, many are exceptionally computer savvy, capable of the digitalization of crop production parameters and evaluation with sensors.

The education of the new employees can be enhanced by the supporting industry that provides the greenhouse hardware, equipment and supplies. One benefit for the investment in education is for improved sales from educated customers, as they'll better understand the need and the capabilities of the products for sale. Two examples of education from industry are provided by CropKing, Inc. and Hort Americas, LLC.

[CropKing](#) has for decades offered a fully functional turnkey greenhouse at the startup or intermediate grower level. They provide immediate production capability, both in environment and plant nutrition, to produce fundamental leafy green or fruiting crops. Furthermore, they teach within their own greenhouse facilities the hands-on operations with classroom support for new growers and an online Knowledge Center for information.

[Hort Americas](#) has been building bridges between academia and growers by developing opportunities for independent learning. These include a YouTube channel with 143 videos available on many CEA basic and more complex topics, free website guides about greenhouse management and fertilizer calculations, and short courses with classroom interactions that develop stronger relationships with customers, who benefit not only from their products, but also their applied knowledge in understanding the requirements for successful projects.

One final thought ... in addition to these approaches to education—primarily focused on production efficiency, product quality and smooth operations—there remains a difficult educational challenge required to develop and expand CEA businesses through wise investing into the appropriate level of technology to meet their established markets. This requires another more advanced type of education; that is, one for business development and management of new facilities.

Dr. Gene Giacomelli is a retired professor in Biosystems Engineering at University of Arizona and the founding director of the UA-Controlled Environment Agriculture Center. He can be reached at giacomel@ag.arizona.edu.