GREENHOUSE COLLEGE OF KNOWLEDGE ONLINE COURSES

1,076 PARTICIPANTS
took the Greenhouse College of Knowledge online courses.

46 U.S. STATES
are represented by online course participants.

PRIORITY AREAS

Greenhouse online course series offerings:

- Biological Control for Greenhouse Growers*
- Greenhouse and Horticultural Lighting*
- Root Zone Management*
- Abiotic Disorders of Greenhouse Crops

* Spanish classes also available

IMPACTS

The Floriculture College of Knowledge Online Course Series provides basic training to commercial greenhouse growers in Michigan, the U.S. and internationally in an easy-to-access and cost-effective manner. The online course series was developed based on face-to-face College of Knowledge courses offered from 1999 to 2011. Since fall 2015, four noncredit online courses have been offered yearly during the winter. Three courses are currently available in Spanish.

Each course offered between 2.5 and 4 hours of pre-recorded video, handouts, quizzes and additional sources of information at $129. After completing each unit and pre- and post-course tests, participants evaluated their progress using self-assessment quizzes.

Of participants surveyed:

83% who took Biological Control for Greenhouse Growers changed practices, impacting 1.35 billion square feet of greenhouse space.

59% who took Greenhouse and Horticultural Lighting changed practices, impacting 23.6 million square feet of greenhouse space.

96% who took Root Zone Management changed practices, impacting 6.2 million square feet of greenhouse space.

100% who took the Abiotic Disorders of Greenhouse Crops changed practices, impacting 1.6 million square feet of greenhouse space.

(n=82 for Biological Control for Greenhouse Growers, 56 for Greenhouse and Horticultural Lighting, 25 for Root Zone Management, 9 for Abiotic Disorders of Greenhouse Crops)

BIOLOGICAL CONTROL FOR GREENHOUSE GROWERS

The Biological Control for Greenhouse Growers course (also offered in Spanish as *Control Biológico para Cultivadores en Invernaderos*) discusses biological control, which is a pest management method that uses pest insects' natural predators to reduce pest insects in the greenhouse. Using biological control pest management prevents crop damage, increases crop quality and decreases the use of pesticides in greenhouse crops.

Of Biological Control participants surveyed:

48% changed or added a natural enemy to their biological control program (39/81).

44% reduced the usage of pesticides (36/81).

APPROXIMATELY 1/3 began a new biological control program, introduced natural enemies earlier in the crop cycle or added banker plants to their pest management programs.

53% reported that they decreased the risk of their employees to pesticide exposure while 63% reported increased crop quality.

(n= 82 since course began in winter 2017)

ROOT ZONE MANAGEMENT

With more than 300 commodities grown and raised, the Root Zone Management course (also offered in Spanish as *Manejo de la Zona Radicular)* teaches how managing the root zone with adequate water and fertility is essential to growing high-quality plants. Growers must understand water sources, pH and alkalinity as well as how to choose a fertilizer for various plant species and how to spot root rot diseases.

Of Root Zone Management participants surveyed:

76% improved their nutrient management practices (19/25).

36% now regularly measure the pH and electrical conductivity of their crops to optimize plant nutrition (9/25).

60% increased crop quality (15/25).

44% reported changing their irrigation and that nutrient management has saved their business money (11/25).

(n= 25 since course began in summer 2017)

GREENHOUSE AND HORTICULTURAL LIGHTING

Greenhouse and Horticultural Lighting (also offered in Spanish as *Iluminación para Horticultura e Invernaderos*) instructs attendees how to use lighting in greenhouses to increase plant growth and induce developmental processes, such as flowering. New technologies including light-emitting diodes have important horticultural applications, which are more energy efficient, thereby decreasing production costs and increasing the profitability of greenhouse businesses.

Of Greenhouse and Horticultural Lighting participants surveyed:

77% were more confident that their light strategy was increasing plant quality and reducing production time (43/56).

75% of lighting sales representatives or consultants that took the course were more confident in matching types of lamps to greenhouse growers' needs (38/51).

52% reported that the information in the course helped them purchase new lamps (29/56).

41% changed their night-interruption lighting strategy to promote early flowering of crops to save electricity and increase efficacy (23/56).

(n= 56 since course began in winter 2015)

ABIOTIC DISORDERS OF GREENHOUSE CROPS

The Abiotic Disorders of Greenhouse Crops course teaches participants how to diagnose plant growth problems related to nonbiotic factors. These include environmental causes and nutrient problems important to crop quality and overall profitability of greenhouse businesses.

Of Abiotic Disorders participants surveyed:

100% have been more confident in diagnosing which environmental conditions might be causing problems (9/9).

100% have been better able to diagnose plant problems (9/9).

78% can now identify nutritional disorders in crops (7/9).

67% changed fertilizer, acid or lime to address nutritional disorders (6/9).

(n=9 since summer 2020)

PARTICIPATION & DEMOGRAPHICS

A total of 1,076 participants took the online greenhouse courses. The participants represented 39 countries, 46 U.S. states and 34 Michigan counties.

Table 1. Number of Participants & Average Scores

	NUMBER OF PARTICIPANTS				TEST SCORES	
	ATTENDING COURSE	FROM OTHER COUNTRIES	FROM US	FROM MI	AVERAGE PRE-TEST SCORE	AVERAGE POST-TEST SCORE
Abiotic Disorders of Greenhouse Crops (English)	116	35	81	27	79%	91%
Biological Control for Greenhouse Growers (English & Spanish)	391	318	73	68	67%	94%
Greenhouse & Horticulural Lighting (English & Spanish)	350	98	252	45	72%	98%
Root Zone Management (English & Spanish)	219	44	175	53	62%	92%
TOTAL	**1,076**	**495**	**581**	**193**		

Table 2. Percentage of Participants by Ethnicity

ETHNICITY	PERCENTAGE
Alaskan/Native American	0.4%
Asian	3.2%
Black	0.6%
Choose not to respond	26.7%
Hispanic	7.1%
Multiracial	1.3%
Pacific Islander	0.2%
Unknown	2.3%
White	58.1%

Table 3. Percentage of Participants by Gender

GENDER	PERCENTAGE
Female	0.35223048%
Male	0.38289963%
Choose not to respond	0.23513011%
Unknown	0.02695167%