

Supplementary S1. Michigan IRB Approval Form

**MICHIGAN STATE**  
**UNIVERSITY**

**Initial Study APPROVAL**

February 6, 2018

To: Bridget K Behe

Re: **MSU Study ID:** STUDY00000196

**IRB:** SIRB

**Principal Investigator:** Bridget K Behe

**Category:** 6, 7

**Submission:** Initial Study STUDY00000196

**Submission Approval Date:** 2/6/2018

**Effective Date:** 2/6/2018

**Project Expiration Date:** 2/5/2019

Title: Consumer Assessment of Plant Displays for Water Use

This submission has been approved by the Michigan State University (MSU) SIRB. The submission was reviewed by the Institutional Review Board (IRB) through the Non-Committee Review procedure. The IRB has found that this research project protects the rights and welfare of human subjects and meets the requirements of MSU's Federal Wide Assurance (FWA00004556) and the federal regulations for the protection of human subjects in research (e.g., 45 CFR 46, 21 CFR 50, 56, other applicable regulations).



**Office of  
Regulatory  
Affairs**  
**Human Research  
Protection Program**

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Suite 136  
Lansing, MI 48910

517-355-2180  
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Email: [irb@msu.edu](mailto:irb@msu.edu)  
[www.hrpp.msu.edu](http://www.hrpp.msu.edu)

**Please note that no research may occur at University of Florida, Apopke or Texas A&M University until their IRBs have either finalized a reliance agreement with us or have conducted their own review and approved this study.**

**Documents Approved:**

- Recruitment advertisement ET survey.docx, Category: Other;
- Online Survey.pdf, Category: Other;
- Recruitment advertisement ET survey.docx, Category: Recruitment Materials;
- HRP 503 v3, Category: IRB Protocol;
- Screening Survey.pdf, Category: Other;
- WateR3 - proposal.pdf, Category: Other;
- Consent form v2, Category: Consent Form;

**Continuing Review:** IRB approval is valid until the expiration date listed above. If the research continues to involve human subjects, you must submit a Continuing Review request at least one month before expiration.

**Modifications:** Any proposed change or modification with certain limited exceptions discussed below must be reviewed and approved by the IRB prior to implementation of the change. Please submit a Modification request to have the

## Supplementary S2. Texas IRB Approval Form

DIVISION OF RESEARCH



### EXEMPTION DETERMINATION

February 23, 2018

Type of Review:	Initial Review
Title:	Consumer Assessment of Plant Displays for Water Use
Investigator:	Charles R Hall
IRB ID:	IRB2018-0108M
Reference Number:	071231
Funding:	USDA - NIFA
Documents Reviewed:	IRB Application Version 1.1; Consent form Version 3.1; Screening Survey Version 1.0; Newspaper/Website Recruitment Advertisement Version 2.1; Online Survey Version 1.0
Risk Level of Study:	Not Greater than Minimal Risk under 45 CFR 46 / 21 CFR 56

Dear Charles R Hall:

The HRPP determined on 02/23/2018 that this research meets the criteria for Exemption in accordance with 45 CFR 46.101(b) under Category 2: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior unless: the information is recorded in an identifiable manner and any disclosure of the subjects' responses outside of research could reasonably place the subject at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability or reputation.

Your exemption is good for five (5) years from the Approval Start Date. At that time, you must contact the IRB with your intent to close the study or request a new determination.

If you have any questions, please contact the IRB Administrative Office at 1-979-458-4067, toll free at 1-855-795-8636.

Sincerely,  
IRB Administration

750 Agronomy Road, Suite 2701  
1186 TAMU  
College Station, TX 77843-1186

Tel. 979.458.1467 Fax. 979.862.3176  
<http://rcb.tamu.edu>

**Supplementary S3. Data Script SAS**

The following are available online at

**Supplementary S4. Dataset for SAS**

The following are available online at

**Supplementary S5. Data Script STATA**

The following are available online at

**Supplementary S6. Dataset for STATA**

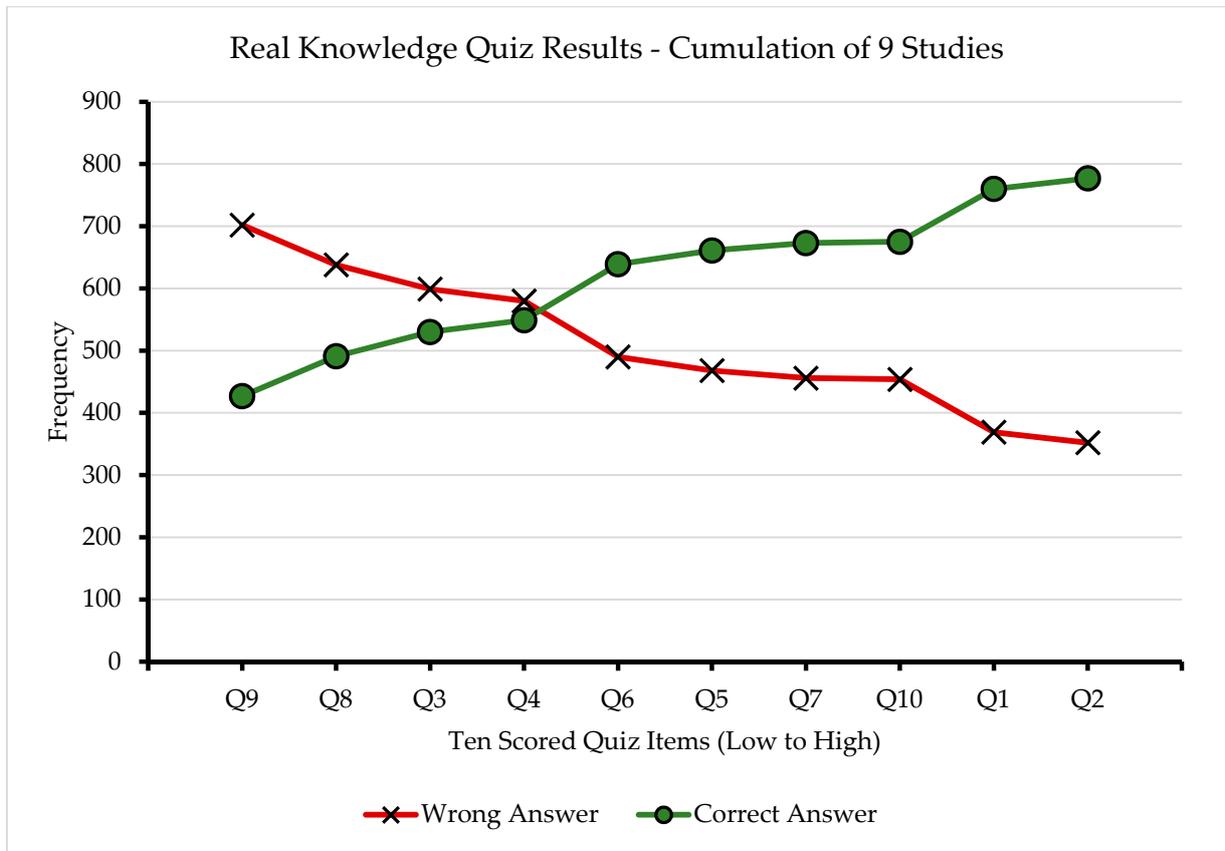
The following are available online at

**Supplementary S7. Knowledge Quiz**

**Table S1.** Item and response options for a Real Knowledge Quiz developed by B. Behe, in 2017. Each item is worth one point. Items are scored as correct (1) or incorrect (0). Mean and standard deviations of the item scores represent the combined participants (N=1,129) of nine studies, 2017 – 2020.

Item ID	Item	Response Option 1	Response Option 2	Response Option 3	Response Option 4	Response Option 5	Score Mean (S.D.)
1	How long does it take for an annual plant produce seed?	<b>One growing season.</b>	Two growing seasons.	Three or more growing seasons.	Don't know or unsure.		0.673 (0.469)
2	True or false, in northern climates, annual plants should be planted after the danger of frost has passed.	<b>True</b>	FALSE	Don't know or unsure.			0.688 (0.463)
3	Which of the following is not an annual plant?*	<b>Hosta</b>	Impatiens	Marigold	Petunia	Don't know or unsure.	0.469 (0.499)
4	Most annual plants generally grow best in which type of soil?	Clay	Sand	<b>Sandy loam</b>	Don't know or unsure.		0.486 (0.500)
5	True or false, some annual plants make good cut flowers like zinnias, snapdragon, and celosia.	<b>True</b>	FALSE	Don't know or unsure.			0.585 (0.493)
6	Annuals are most often started from	Budding	Grafting	<b>Seed</b>	Don't know or unsure.		0.566 (0.496)
7	In order to flower, many annual plants need how much direct sunlight in order to grow and flower?	Generally, only 2-4 hours of direct sunlight per day.	<b>Generally 6-8 hours of direct sunlight per day.</b>	Generally, 24 hours of sunlight is needed.	Don't know or unsure.		0.596 (0.491)
8	Which of the following is not an annual plant?	<b>Apple</b>	Watermelon	Squash	Don't know or unsure.		0.435 (0.496)
9	Which of the following is not a perennial plant?	<b>Begonia</b>	Coreopsis	Day lily	Don't know or unsure.		0.378 (0.485)
10	How much water do most annual plants need to thrive in summer?	Very little, less than 1" of rain per month.	<b>Some, about 1" of rain per week.</b>	A lot, about 1" of rain per day.	Don't know or unsure.		0.598 (0.491)

\*Correct answers are shown in bold font style.



**Figure S1.** Graphical representation of monotonic trace lines for the correctly and incorrectly answered ten quiz items given to the combined participants (N=1,129) of nine studies, 2017 – 2020. See page 398 – 399 of Handbook of Test Development, edited by Suzanne Lane, et al., Taylor & Francis Group, 2015. ProQuest Ebook Central, <https://ebookcentral-proquest-com.proxy1.cl.msu.edu/lib/michstate-ebooks/detail.action?docID=4185727>.

**Table S2.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge in Study 1. Test given to participants of an online survey in the Midwest US on March 28, 2017. N, Mean (S.D.) = 164, 5.579 (2.645). The overall Cronbach's alpha for the standardized variables was 0.750.

<b>Item</b>	<b>N Correct</b>	<b>Mean (SD)</b>	<b>Alpha</b>
1	105	0.640 (0.481)	0.735
2	129	0.787 (0.411)	0.739
3	76	0.463 (0.500)	0.719
4	64	0.390 (0.489)	0.729
5	121	0.738 (0.441)	0.732
6	101	0.616 (0.488)	0.737
7	92	0.561 (0.498)	0.727
8	84	0.512 (0.501)	0.715
9	46	0.280 (0.451)	0.730
10	97	0.591 (0.493)	0.732

**Table S3.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-lab (glasses) eye tracking study in May 2017, East Lansing, MI. N, Mean (S.D.) = 92, 6.043 (2.882). The overall Cronbach's alpha for the standardized variables was 0.814 in Study 2.

Item	N Correct	Mean (SD)	Alpha
1	66	0.717 (0.453)	0.793
2	77	0.837 (0.371)	0.804
3	45	0.489 (0.503)	0.786
4	49	0.533 (0.502)	0.785
5	52	0.565 (0.498)	0.808
6	58	0.630 (0.485)	0.803
7	65	0.707 (0.458)	0.797
8	59	0.641 (0.482)	0.797
9	27	0.293 (0.458)	0.804
10	58	0.630 (0.485)	0.797

**Table S4.** Sociodemographic profiles of respondents in Study 2 (N=92).

Profile	Frequency	Percentage	Correct of 10 Mean (S.D.)	F, p
<i>Gender</i>				
Male			5.7 (3.2)	n.s.
Female			6.2 (2.7)	
<i>Race</i>				
Caucasian	63	68.48	6.95 a (2.47)	25.16, <.0001
Others	29	31.52	4.07 b (2.75)	
<i>Education</i>				
Less than 4 yr degree			5.8 (3.0)	n.s.
4 yr degree or higher			6.1 (2.9)	

**Table S5.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-store (glasses) eye tracking study in May 2017, East Lansing, MI. N, Mean (S.D.) = 32, 4.938 (2.602). The overall Cronbach's alpha for the standardized variables was 0.756 in Study 3.

Item	N Correct	Mean (SD)	Alpha
1	15	0.469 (0.507)	0.752
2	25	0.781 (0.420)	0.721
3	11	0.344 (0.483)	0.731
4	13	0.406 (0.499)	0.738
5	18	0.563 (0.504)	0.724
6	16	0.500 (0.508)	0.744
7	22	0.688 (0.471)	0.739
8	13	0.406 (0.499)	0.726
9	2	0.063 (0.246)	0.757
10	23	0.719 (0.457)	0.727

**Table S6.** Sociodemographic profiles of respondents in Study 3 (N=32).

Profile	Frequency	Percentage	Correct of 10 Mean (S.D.)	F, p
<i>Gender</i>				
Male			4.1 (2.6)	n.s.
Female			5.3 (2.6)	
<i>Race</i>				
Caucasian	21	65.63	5.048 (3.008)	n.s.
Others	11	34.38	4.727 (1.679)	
<i>Education</i>				
Less than 4 yr degree			5.1 (2.0)	n.s.
4 yr degree or higher			4.9 (2.8)	

**Table S7.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-lab (glasses) eye tracking study in May 2018, East Lansing, MI. N, Mean (S.D.) = 97, 5.216 (2.223). The overall Cronbach's alpha for the standardized variables was 0.636 in Study 4.

Item	N Correct	Mean (SD)	Alpha
1	70	0.722 (0.451)	0.632
2	80	0.825 (0.382)	0.621
3	33	0.340 (0.476)	0.568
4	46	0.474 (0.502)	0.630
5	57	0.588 (0.495)	0.599
6	38	0.392 (0.491)	0.611
7	65	0.670 (0.473)	0.616
8	43	0.443 (0.499)	0.585
9	13	0.134 (0.342)	0.591
10	61	0.629 (0.486)	0.653

**Table S8.** Sociodemographic profiles of respondents in Study 4 (N=97).

Profile	Frequency	Percentage	Correct of 10 Mean (S.D.)	F, p
<i>Gender</i>				
Male			5.5 (2.5)	n.s.
Female			5.1 (2.1)	
<i>Race</i>				
Caucasian	56	57.73	5.893 (2.270)	13.91, 0.0003
Others	41	42.27	4.293 (1.806)	
<i>Education</i>				
Less than 4 yr degree			4.7 (2.1)	n.s.
4 yr degree or higher			5.4 (2.2)	

**Table S9.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-store (glasses) eye tracking study in May 2017, East Lansing, MI. N, Mean (S.D.) = 85, 4.906 (2.772). The overall Cronbach's alpha for the standardized variables was 0.797 in Study 5.

Item	N Correct	Mean (SD)	Alpha
1	59	0.694 (0.464)	0.791
2	64	0.753 (0.434)	0.770
3	24	0.282 (0.453)	0.759
4	39	0.459 (0.501)	0.764
5	37	0.435 (0.499)	0.776
6	34	0.400 (0.493)	0.803
7	59	0.694 (0.464)	0.785
8	36	0.424 (0.497)	0.776
9	14	0.165 (0.373)	0.777
10	51	0.600 (0.493)	0.788

**Table S10.** Sociodemographic profiles of respondents in Study 5 (N=85).

Profile	Frequency	Percentage	Correct of 10 Mean (S.D.)	F, p
<i>Gender</i>				
Male			4.3 (3.1)	n.s.
Female			5.1 (2.6)	
<i>Race</i>				
Caucasian	60	70.59	5.100 (2.815)	n.s.
Others	25	29.41	4.440 (2.663)	
<i>Education</i>				
Less than 4 yr degree			4.9 (3.0)	n.s.
4 yr degree or higher			4.9 (2.7)	

**Table S11.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-lab (screen) eye tracking study in August 2018, East Lansing, MI. N, Mean (S.D.) = 81, 5.469 (2.510). The overall Cronbach's alpha for the standardized variables was 0.716 in Study 6.

Item	N Correct	Mean (SD)	Alpha
1	60	0.741 (0.441)	0.688
2	67	0.827 (0.380)	0.714
3	26	0.321 (0.470)	0.635
4	42	0.519 (0.503)	0.715
5	44	0.543 (0.501)	0.694
6	37	0.457 (0.501)	0.702
7	50	0.617 (0.489)	0.709
8	46	0.568 (0.498)	0.656
9	22	0.272 (0.448)	0.688
10	49	0.605 (0.492)	0.725

**Table S12.** Sociodemographic profiles of respondents in Study 6 (N=81).

Profile	Frequency	Percentage	Correct of 10 Mean (S.D.)	F, p
<i>Gender</i>				
Male			6.1 (2.7)	n.s.
Female			5.2 (2.4)	
<i>Race</i>				
Caucasian	50	61.73	5.800 (2.595)	n.s.
Others	31	38.27	4.935 (2.308)	
<i>Education</i>				
Less than 4 yr degree			4.9 (2.2)	n.s.
4 yr degree or higher			5.6 (2.6)	

**Table S13.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-lab (screen) eye tracking study in Fall-Winter 2018 in Study 7. Testing was done in College Station, TX (Oct 2018, N=47) and East Lansing, MI (Dec. 2019, N=64). Overall N, Mean (S.D.) = 111, 4.856 (2.812). The overall Cronbach's alpha for the standardized variables was 0.786.

Loc'n	N	Correct	Item	Mean (SD)	Alpha
MI	32		1	0.500 (0.504)	0.736
MI	42		2	0.656 (0.479)	0.715
MI	20		3	0.313 (0.467)	0.708
MI	30		4	0.469 (0.503)	0.739
MI	34		5	0.531 (0.503)	0.698
MI	27		6	0.422 (0.498)	0.697
MI	38		7	0.594 (0.495)	0.710
MI	24		8	0.375 (0.488)	0.691
MI	5		9	0.078 (0.270)	0.702
MI	36		10	0.563 (0.500)	0.756
MI		Overall		4.500 (2.551)	0.737
TX	30		1	0.638 (0.486)	0.811
TX	29		2	0.617 (0.491)	0.827
TX	17		3	0.362 (0.486)	0.801
TX	27		4	0.574 (0.500)	0.817
TX	28		5	0.596 (0.496)	0.810
TX	30		6	0.638 (0.486)	0.834
TX	27		7	0.574 (0.500)	0.821
TX	21		8	0.447 (0.503)	0.812
TX	14		9	0.298 (0.462)	0.813
TX	28		10	0.596 (0.496)	0.819
TX		Overall		5.340 (3.095)	0.832

**Table S14.** Sociodemographic profiles of respondents in Study 7 (N=111).

Profile	Frequency	Percentage	Correct of 10 Mean (S.D.)	F, p
<i>Gender</i>				
Male			5.2 (3.1)	n.s.
Female			4.6 (2.6)	
<i>Race</i>				
Caucasian	78	70.27	5.218 (2.908)	4.49, 0.0364
Others	33	29.73	4.000 (2.398)	
<i>Education</i>				
Less than 4 yr degree			4.0 (2.3)	8.60, 0.0041
4 yr degree or higher			5.5 (3.0)	

**Table S15.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-lab (screen) eye tracking study at three locations: Apopka, FL (Sept 2018, N=97), College Station, TX (Oct 2018, N=105) and East Lansing, MI (Oct - Dec 2018, N=110) in Study 8. Overall N, Mean (S.D.) = 311, 4.611 (2.718). The overall Cronbach's alpha for the standardized variables was 0.766.

Loc'n	N	Correct	Variable	Mean (SD)	Alpha
FL	74	1		0.771 (0.423)	0.776
FL	40	2		0.417 (0.496)	0.748
FL	40	3		0.417 (0.496)	0.740
FL	62	4		0.646 (0.481)	0.747
FL	60	5		0.625 (0.487)	0.762
FL	65	6		0.677 (0.470)	0.760
FL	53	7		0.552 (0.500)	0.739
FL	16	8		0.167 (0.375)	0.772
FL	54	9		0.563 (0.499)	0.741
FL	54	10		0.563 (0.499)	0.762
FL	N=97	Overall		5.396 (2.739)	0.774
MI	66	1		0.600 (0.492)	0.650
MI	35	2		0.318 (0.468)	0.621
MI	45	3		0.409 (0.494)	0.654
MI	44	4		0.400 (0.492)	0.650
MI	36	5		0.327 (0.471)	0.646
MI	58	6		0.527 (0.502)	0.628
MI	43	7		0.391 (0.490)	0.626
MI	11	8		0.100 (0.301)	0.646
MI	51	9		0.464 (0.501)	0.642
MI	54	10		0.491 (0.502)	0.662
MI	N=110	Overall		4.027 (2.364)	0.667
TX	73	1		0.695 (0.463)	0.799
TX	34	2		0.324 (0.470)	0.785
TX	51	3		0.486 (0.502)	0.795
TX	43	4		0.410 (0.494)	0.797
TX	46	5		0.438 (0.499)	0.782
TX	62	6		0.590 (0.494)	0.799
TX	40	7		0.381 (0.488)	0.787
TX	14	8		0.133 (0.342)	0.795
TX	51	9		0.486 (0.502)	0.798
TX	59	10		0.562 (0.499)	0.800
TX	N=105	Overall		4.505 (2.893)	0.811
All	213	1		0.685 (0.465)	0.757
All	109	2		0.350 (0.478)	0.736
All	136	3		0.437 (0.497)	0.748
All	149	4		0.479 (0.500)	0.746
All	142	5		0.457 (0.499)	0.743
All	185	6		0.595 (0.492)	0.747
All	136	7		0.437 (0.497)	0.735
All	41	8		0.132 (0.339)	0.754

All	156	9	0.502 (0.501)	0.745
All	167	10	0.537 (0.499)	0.757
N=311		Overall	4.611 (2.718)	0.766

**Table S16.** Sociodemographic profiles of respondents in Study 8 (N=311).

<b>Profile</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Correct of 10 Mean (S.D.)</b>	<b>F, p</b>
Gender				
Male			4.4 (2.8)	n.s.
Female			4.7 (2.7)	
Race				
Caucasian	227	72.99	4.952 (2.761)	13.74, 0.0002
Others	84	27.01	3.690 (2.380)	
Education				
Less than 4 yr degree			4.4 (2.5)	n.s.
4 yr degree or higher			4.8 (2.9)	

**Table S17.** Means and standard deviations for correct answers for each item in the 10-question Annual Plant Knowledge Test given to participants during the survey portion of an in-store (glasses) eye tracking study in Spring 2019 in Study 9. Testing was done in two western (W) and two eastern (E) Michigan garden centers (W-1, N=37; W-2, N=41; E-1, N=39; E-2, N=40). Overall N, Mean (S.D.) = 156, 7.782 (2.011). The overall Cronbach's alpha for the standardized variables was 0.670.

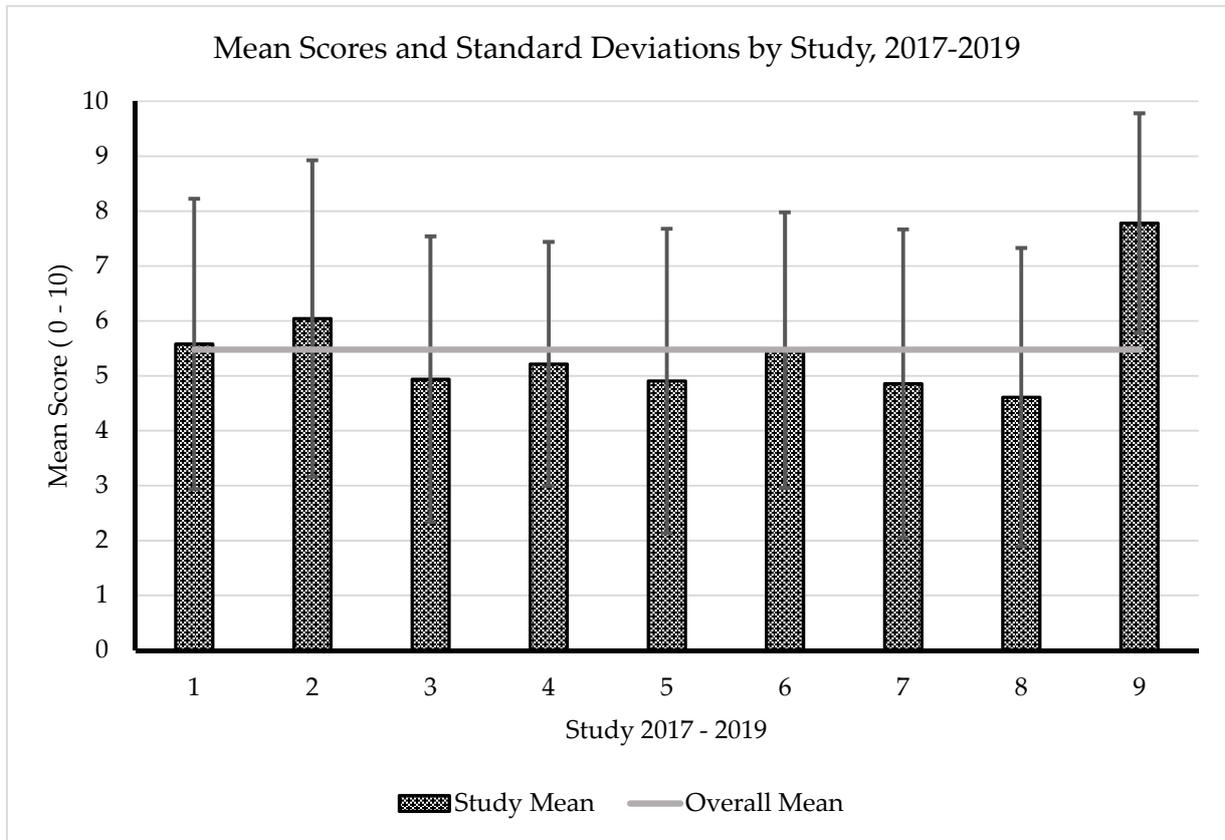
<b>Loc'n</b>	<b>N Correct</b>	<b>Variable</b>	<b>Mean (SD)</b>	<b>Alpha*</b>
E-2	29	1	0.725 (0.452)	<i>0.589</i>
E-2	40	2	1.000 (0.000)	<i>0.634</i>
E-2	36	3	0.900 (0.304)	<i>0.586</i>
E-2	24	4	0.600 (0.496)	<i>0.565</i>
E-2	30	5	0.750 (0.439)	<i>0.551</i>
E-2	26	6	0.650 (0.483)	<i>0.629</i>
E-2	31	7	0.775 (0.423)	<i>0.626</i>
E-2	31	8	0.775 (0.423)	<i>0.603</i>
E-2	33	9	0.825 (0.385)	<i>0.581</i>
E-2	25	10	0.625 (0.490)	<i>0.635</i>
	N=40	Overall	7.625 (1.983)	0.627
W-2	31	1	0.756 (0.435)	<i>0.587</i>
W-2	41	2	1.000 (0.000)	<i>0.629</i>
W-2	39	3	0.951 (0.218)	<i>0.560</i>
W-2	27	4	0.659 (0.480)	<i>0.531</i>
W-2	39	5	0.951 (0.218)	<i>0.560</i>
W-2	36	6	0.878 (0.331)	<i>0.527</i>
W-2	35	7	0.854 (0.358)	<i>0.688</i>
W-2	34	8	0.829 (0.381)	<i>0.605</i>
W-2	34	9	0.829 (0.381)	<i>0.615</i>
W-2	29	10	0.707 (0.461)	<i>0.618</i>
	N=41	Overall	8.415 (1.688)	0.622
W-1	22	1	0.611 (0.494)	<i>0.619</i>
W-1	35	2	0.972 (0.167)	<i>0.684</i>
W-1	32	3	0.889 (0.319)	<i>0.652</i>
W-1	20	4	0.556 (0.504)	<i>0.688</i>
W-1	33	5	0.917 (0.280)	<i>0.659</i>
W-1	24	6	0.667 (0.478)	<i>0.641</i>
W-1	30	7	0.833 (0.378)	<i>0.722</i>
W-1	31	8	0.861 (0.351)	<i>0.654</i>
W-1	28	9	0.778 (0.422)	<i>0.613</i>
W-1	24	10	0.667 (0.478)	<i>0.689</i>
	N=36	Overall	7.750 (2.034)	0.687
E-1	28	1	0.718 (0.456)	<i>0.683</i>
E-1	39	2	1.000 (0.000)	<i>0.700</i>

E-1	35	3	0.897 (0.307)	<i>0.658</i>
E-1	19	4	0.487 (0.506)	<i>0.692</i>
E-1	26	5	0.667 (0.478)	<i>0.644</i>
E-1	27	6	0.692 (0.468)	<i>0.642</i>
E-1	23	7	0.590 (0.498)	<i>0.653</i>
E-1	28	8	0.718 (0.456)	<i>0.678</i>
E-1	33	9	0.846 (0.366)	<i>0.651</i>
E-1	27	10	0.692 (0.468)	<i>0.668</i>
N=39		Overall	7.308 (2.190)	0.691
	110	1	0.705 (0.457)	0.642
	155	2	0.994 (0.080)	0.685
	142	3	0.910 (0.287)	0.615
	90	4	0.577 (0.496)	0.649
	128	5	0.821 (0.385)	0.622
	113	6	0.724 (0.448)	0.626
	119	7	0.763 (0.427)	0.676
	124	8	0.795 (0.405)	0.649
	128	9	0.821 (0.385)	0.626
	105	10	0.673 (0.471)	0.664
N=156		Overall	7.782 (2.001)	0.670

\*Alphas in italics represent the raw variables. All participants at this garden center correctly answered Item 2.

**Table S18.** Sociodemographic profiles of respondents of Study 9 (N=156).

<b>Profile</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Correct of 10 Mean (S.D.)</b>	<b>F, p</b>
<i>Gender</i>				
Male			7.6 (2.2)	n.s.
Female			7.8 (2.0)	
<i>Race</i>				
Caucasian	145	92.95	7.869 (1.948)	3.95, 0.0485
Others	11	7.05	6.636 (2.420)	
<i>Education</i>				
Less than 4 yr degree			7.5 (2.0)	n.s.
4 yr degree or higher			7.9 (2.0)	



**Figure S2.** Graphical representation of mean scores and standard deviations for the ten quiz items to the combined participants (N=1129) of nine studies, 2017 – 2020. Quiz is designed to test participant horticultural knowledge. Items are scored as correct (1) or incorrect (0).The overall mean score is included for reference.

### Supplementary 8. Principal Component Analyses

The first principal component analysis produced a two-component solution with a Cronbach's alpha = 0.8280 and accounting for 48.6% of the variance in the items (Table S19). The first component to emerge was Active Landscape Enjoyment which consisted of 15 items: "I like to grow vegetables", "I grow vegetables, herbs, or fruits in my landscape", "Working with plants outdoors is a valuable way to spend time", "Working with plants outdoors is a pleasant break from my other activities", "I like to enjoy the harvest from my outdoor vegetables and herbs", "I have a landscape that yields fresh produce", "I like to grow herbs", "I get great satisfaction from working in the outdoor landscaped areas around my home", "I like working with outdoor plants", "A landscape that produces food (vegetables, fruits, herbs)", "The outdoor space around my home is an important place for my leisure activities", "My family makes a lot of use of the outdoor space at our home", "I enjoy showing friends around my property or landscaped areas", "Large areas of garden beds at your property", and "I hardly ever use the outdoor space at my home for recreation".

The second component to emerge was Landscape Aesthetic which contained six items: "A vibrant landscape", "A landscape that fits into the neighborhood", "A lush landscape", "A landscape that adds value to my home", "A landscape that is the envy of the neighbors", and "A well-irrigated landscape".

**Table S19.** Principal component analysis of landscape questions adapted from Syme et al. [52] and Behe et al. [8].

Item	Active Landscape Enjoyment	Landscape Aesthetic
I like to grow vegetables.	0.777	-0.375
I grow vegetables, herbs, or fruits in my landscape.	0.763	-0.269
Working with plants outdoors is a valuable way to spend time.	0.751	-0.03
Working with plants outdoors is a pleasant break from my other activities.	0.747	-0.006
I like to enjoy the harvest from my outdoor vegetables and herbs.	0.742	-0.384
I have a landscape that yields fresh produce.	0.704	-0.229
I like to grow herbs.	0.703	-0.331
I get great satisfaction from working in the outdoor landscaped areas around my home.	0.688	0.069
I like working with outdoor plants.	0.653	-0.037
A landscape that produces food (vegetables, fruits, herbs).	0.643	-0.168
The outdoor space around my home is an important place for my leisure activities.	0.619	0.281
My family makes a lot of use of the outdoor space at our home.	0.575	0.261
I enjoy showing friends around my property or landscaped areas.	0.561	0.34
Large areas of garden beds at your property.	0.559	0.277
I hardly ever use the outdoor space at my home for recreation.	-0.548	-0.222
A vibrant landscape.	0.106	0.714
A landscape that fits into the neighborhood.	-0.055	0.635
A lush landscape.	0.303	0.61
A landscape that adds value to my home.	0.142	0.588

A landscape that is the envy of the neighbors.	0.174	0.587
A well-irrigated landscape.	0.062	0.573
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Percent of Variance	33.2%	15.6%
Overall		
Variance Explained by Each Factor Before Rotation	6.9630	3.2510
Variance Explained by Each Factor With Orthogonal Rotation	6.8950	3.5160
Cronbach Coefficient Alpha -- Raw Variables	0.8280	0.7610
Cronbach Coefficient Alpha - Standardized Variables	0.8130	0.7680
Kaiser-Meyer-Olkin Measure of Sample Adequacy	0.8740	

For the second Principal Component Analysis, the analysis focused on plant expertise and involvement items. The component that emerged, Plant Expertise, with high reliability (Cronbach's alpha = 0.9540) and accounted for 51.5% of the variance in the items (Table S20). Of the 25 items in the initial analysis, 22 loaded onto the component including: "I can recognize many names of plants", "I know a lot about plants", "I consider myself knowledgeable about plants", "I am knowledgeable about plants", "I can recall many plants from memory", "My knowledge of plants helps me to understand very technical information about them", "I am a plant expert", "Compared to other people, I am interested in plants", "I keep current on the most recent developments about plants", "I can recall product-specific attributes about plants", "I am involved with growing plants", "I automatically know which plants to buy", "I enjoy learning about plants", "I enjoy learning about plants", "I can recognize many names of plants", "I think that plants are boring to exciting", "I think that plants are of no concern to me to of great concern to me", "I think that plants are mundane to fascinating", "I grow plants around my home", "I think that plants mean nothing to me to are of great importance to me", "I think that plants are uninteresting to interesting", "I can immediately identify my preferred plants even if they are displayed with others", and "At the place of purchase, I can visually detect my preferred plants without much effort".

**Table S20.** Principal component analysis of plant expertise questions.

Item	Plant Expertise
I can recognize many names of plants.	0.876
I know a lot about plants.	0.876
I consider myself knowledgeable about plants.	0.870
I am knowledgeable about plants.	0.868
I can recall many plants from memory.	0.776
My knowledge of plants helps me to understand very technical information about them.	0.766
I am a plant expert.	0.754
Compared to other people, I am interested in plants.	0.746
I keep current on the most recent developments about plants.	0.731
I can recall product-specific attributes about plants.	0.730
I am involved with growing plants.	0.725
I automatically know which plants to buy.	0.699
I enjoy learning about plants.	0.699
I can recognize many names of plants.	0.686

I think that plants are boring to exciting.	0.650
I think that plants are of no concern to me to of great concern to me.	0.630
I think that plants are mundane to fascinating.	0.607
I grow plants around my home.	0.598
I think that plants mean nothing to me to are of great importance to me.	0.594
I think that plants are uninteresting to interesting	0.592
I can immediately identify my preferred plants even if they are displayed with others.	0.592
At the place of purchase, I can visually detect my preferred plants without much effort.	0.578
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Percent of Variance	51.5%
Overall	
Variance Explained by Each Factor Before Rotation	10.3670
Variance Explained by Each Factor With Orthogonal Rotation	11.3310
Cronbach Coefficient Alpha -- Raw Variables	0.9540
Cronbach Coefficient Alpha - Standardized Variables	0.9540
Kaiser-Meyer-Olkin Measure of Sample Adequacy	0.9380
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