



University of Nevada
Cooperative Extension

Special Publication 12-12

SITUATIONAL ANALYSIS: HORTICULTURAL NEEDS AND TRENDS IN NEVADA

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FOREWARD

The mission of University of Nevada Cooperative Extension (UNCE) is “to discover, develop, disseminate, preserve and use knowledge to strengthen the social, economic and environmental well-being of people.” To achieve this goal, UNCE is charged with developing, implementing and evaluating education programs that address critical needs and issues. The results of internal and external comprehensive needs assessments, studies, stakeholder interviews and surveys have been compiled here to identify potential horticulture education targets and program efforts in Nevada. This publication is targeted mainly to Cooperative Extension professionals in Nevada but may also be of use to other Nevada university faculty, agencies, industries and citizens.

The authors have chosen to explore trends in horticulture, first from a national and regional perspective, then on a state level and finally, a local level. We chose to look forward in order to build educational efforts that are proactive rather than reactive. We hypothesized that we could best assess the current situation and future needs of our communities by balancing the immediate needs, as expressed by citizens, with trends that are occurring regionally and nationally.

Specifically, our efforts were based on examination of recent needs assessments from a variety of sources of relevant research and information. We looked at national economic studies and surveys of the Nevada green industry, as well as surveys of UNCE Master Gardener volunteers and the general public. We contacted Extension horticulture education professionals across the western United States, including within Nevada, to assess what they see as national and regional trends. We investigated U.S. Department of Agriculture directives and Horticultural Research Institute funded projects. We then summarized these into one cohesive report.

References to the materials used in this study and others useful for additional insights are presented at the end of the report. Our goal was to gain a more balanced view of our changing world, to investigate the unique ways other state Extension faculty have and are responding to those changes and to use those ideas to more clearly focus our outreach efforts.

INTRODUCTION

NEVADA DEMOGRAPHICS

The population of Nevada grew by 35.1 percent from 2000 to 2010, from almost 2 million to 2.7 million people (U.S. Census Bureau, 2000 and 2010). The counties experiencing the greatest population growth included Lyon (50.7 percent), Clark (41.8 percent), Nye (35.3 percent), Lincoln (28.3 percent) and Washoe (24.1 percent). In Nevada, 29 out of 487 census tracts (Appendix A) are considered food deserts (USDA Economic Research Service, 2012). A food desert is defined as a census tract where a substantial number or share of residents has limited access to a supermarket or large grocery store. Combined, these tracts contain 82,986 people with limited access to fresh food (67.7 percent of the population within those tracts). The numbers include 19,199 children under the age of 18 and 8,751 seniors 65 years of age or older.

These numbers are significant because the slow economic recovery, high unemployment rates (11.6 percent unemployment in Nevada compared to 8.3 percent nationally, U.S. Bureau of Labor Statistics, 2012) and increasing costs of health care, fuel and food have left many Nevadans feeling insecure about their economic future and their ability to provide for their own basic needs (McGarry, 2012). This generalized unease has driven many Nevadans back to the land in search of ways to be more self-sufficient and economically resilient into the next decade. These realities and perceptions drive educational needs and desires of our client base and must be taken into consideration in an assessment of how Cooperative Extension professionals should respond. Correspondingly, the top-rated horticulture trends, both nationally and regionally, are firmly rooted in a need to learn basic survival skills during a time of economic uncertainty. These include skills our ancestors took for granted, including home production, storage and preservation of food (Kaplan and Blume, 2011).

Of course, all of this must be tempered with the needs and ideas of a new generation of gardeners; i.e., we cannot go back to the time of our grandparents. New gardeners embrace technology and have a faster pace of life. They are combining landscaping with fruit and vegetable gardening to create edible landscapes that make the best use of their time and water resources. Many live in urban areas and require growing strategies that allow them to produce

food on the smallest footprint of land – in small urban yards, on balconies, in containers, on rooftops, in vacant lots and vertically along walls and other structures. Today’s gardeners also think locally and want to share with their community. They may devote part of their harvest for donation to food pantries, and they support local food producers by frequenting farmers markets and supporting community gardens and community-supported agriculture operations (Vanderhaar, pers. comm., 2012).

NEVADA CLIMATE

Nevada is the driest state in the U.S. Precipitation occurs primarily in the winter as snow in the northern part of the state and rain in the southern part. The average annual precipitation is approximately 4.5 inches in Las Vegas (south) and 7.5 inches in Reno (north). Summer temperatures range up to 125 degrees Fahrenheit in the southern portion of the state to winter temperatures as low as -50 degrees Fahrenheit in the north. The freeze-free season varies from less than 70 days in the northwest and northeast (e.g., Winnemucca, Eureka) to about 140 days in the west and south-central areas (e.g., Fallon, Tonopah), to over 225 in the south (e.g., Las Vegas) (Desert Research Institute, 2012). Precipitation and varying temperatures combined with drying winds and low humidity challenge horticultural endeavors. Late spring frosts often hamper production on fruit-bearing plants. In addition, Nevada soils are generally rocky or clayey and infertile, with less than 1 percent organic matter. Soils may also be high in salts, and some areas are infested with high levels of boron or other toxic compounds, limiting the range of plants that will thrive.

On top of all of this, Nevada’s climate is warming. Nevada has experienced a 0.367 degree Fahrenheit temperature increase per decade since 1970, up from an overall 0.196 degree per-decade increase during the time period 1912-2011. *“Since 1970, warming began accelerating everywhere. The speed of warming across the lower 48 [states] more than tripled, from 0.127 degrees Fahrenheit per decade over the 100-year period, to 0.435 degrees Fahrenheit per decade since 1970”* (Tebaldi, Adams-Smith and Heller, 2012). Further, the USDA Plant Hardiness Zone Map was revised in January 2012 to reflect finer scale resolution of mean extreme minimum temperatures across an area (USDA Agricultural Research Service, 2012). As an example of changes in Nevada, the Reno area is now rated at USDA plant hardiness zone 6 to 7, as compared to the previous rating of 5 to 6, with higher numbers indicating higher annual mean minimum temperatures. At face value, higher annual mean minimum temperatures could be seen as a horticultural advantage, allowing for a greater diversity in crops that can be grown in a particular area. In reality, these higher plant hardiness zone ratings do not reflect the coldest it ever will be at a specific location at a given time. Nor do they reflect the more extreme and less predictable weather events attributed to climate change (Environmental

Defense Fund, 2012), which could result in greater crop losses due to late spring or early fall frosts, drought or flooding.

These harsh conditions, coupled with the inevitability of a changing climate and the desire to produce food in close proximity to populated areas, support the need for alternative crop production methods, including use of season extension methods and farming practices more conducive to urban or semi-urban environments. In addition, new plant introductions are needed that can survive with less water in poor soils. Landscaping practices that conserve water, require fewer chemical inputs and prevent or mitigate potential damage by wildfires must be adopted by homeowners and landscapers to preserve Nevada's natural resources.

HORTICULTURAL TRENDS

“Currently, one of the most widely discussed topics in the green industry, which is promulgated by consumers exhibiting greater degrees of environmental awareness, is the issue of environmental sustainability” (Hall, 2010).

Based on our search of the literature, trends in research and funded projects and informal surveys of other Extension professionals, we conclude that the top five national trends in horticulture include:

- Home vegetable and fruit gardening, including edible landscaping
- Localized food production, urban farming, and community and school gardens
- Environmentally friendly landscaping products and practices, including gardening to sustain wildlife and pollinator populations
- Reduced-risk pest control
- Landscape water conservation

TRENDS IN CONSUMER HORTICULTURE

To get a regional perspective on consumer trends, we completed an informal survey of Extension professionals across the western region of the U.S. using a predetermined set of questions (Table 1). Questions included:

1. In your opinion, what are the most important national consumer/commercial horticultural issues/trends?
2. What horticultural issues/trends are you noticing in your state?
3. What horticultural issues are voiced by the public in your state?
4. What horticultural issues are voiced by the green industry in your state?
5. In your opinion, what is the most innovative (new and exciting) horticultural program in your state?

The top national trend observed by our colleagues was a greater consumer emphasis on home food production and edible landscaping (Table 1). This ties into the local food movement, a phenomenon supported by First Lady Michelle Obama’s focus on home gardening, her creation of the Whitehouse Kitchen Garden and her new book, “American Grown.” The same trends were noted at the state level, and some of the innovative new Extension programs were related to integration of Extension activities with the local food movement. A need for greater education regarding integrated pest management and reduced risk pest control methods were cited next. State level concern about introduction of new diseases and pests, including invasive plants, depended on the level of nursery production in that state. Environmental awareness and sustainability dominated the remaining reported trends, with native plant landscaping and water conservation topping the list. The need for continuing education to maintain certification, including pesticide training, topped the list of green industry concerns within western states. The top needs voiced by the public (to Extension professionals) in western states were education in home food production and diagnosis and management of plant pests.

Although not specifically reflected in our survey, it should be noted that school gardening as a health and education issue is an emerging national, state and local trend. Both the Centers for Disease Control and Prevention and the Nevada State Health Division Fitness and Wellness Council have identified the presence of school and community gardens as an indicator of a community’s health (Ohri-Vachaspati, 2009; Seymour, pers. comm., 2012). This trend represents an opportunity for collaboration among Cooperative Extension disciplines and professionals.

Table 1. Informal Survey of Cooperative Extension Professionals in Western States (N=9)

Responses*	No. of times cited
1. National trends:	
Greater emphasis on home food production/edible landscaping	4
IPM and reduced risk pest control	2
Local food movement with community sharing (food banks, farmers markets, community gardens, CSAs)	1
Invasive species	1
Extreme weather events due to climate change	1
Economic issues related to the recession	1
Landscape water conservation	1
Increased need for -xtension horticultural education of consumers (with increase in @ternet vs. local retail sales of horticultural products)	1
Reducing the time and cost of outdoor landscape maintenance	1

2. State issues (as noted by Extension Professional):	
Edible landscaping and fruit production	4
Invasion of new diseases/insects/invasive plant species	4
Greater interest in growing food locally/community gardens	3
Sustainable landscaping, including native plant gardens	3
Drought/water issues	2
Less toxic/organic pest management	2
Season extension for food production	1
Alternatives to turfgrass-dominated landscapes	1
Wildfires	1
3. State issues (as voiced by public):	
Local and home food production	4
Pest/plant diagnosis and management	3
Landscape water conservation	2
Environmentally friendly landscaping practices, including organic gardening	2
Strong anti-turfgrass sentiment	1
4. State issues (as voiced by green industry):	
Certification and continuing education (including pesticide training)	4
Economy and labor issues	3
Lack of good plants (esp. trees) for desert and high desert climates	2
Invasive pests	1
Nursery stock transportation costs	1
5. Innovative new programs (response to needs/trends):	
Involvement with local food movement projects/urban farms	2
Greater use of demo gardens for education	2
Expanded master gardener programs due to increased interest	2
High tunnels and other season extension methods	1
Evaluation of drought-tolerant plants (esp. turf and turf substitutes)	1
Plant evaluation programs with direct connection to nursery industry	1
Environmentally friendly landscaping projects	1
Peach tree borer monitoring/trapping program has nearly eliminated the need to spray	1

*Responses elicited by phone or email contact.

TRENDS WITHIN THE HORTICULTURE INDUSTRY

The Horticultural Research Institute (HRI) is the research arm of the American Nursery and Landscape Association. It is committed to supporting research efforts focused on the highest priority needs of the green industry. HRI-supported projects focus on significant problems, regulatory issues and emerging opportunities in the nursery and landscape industry. We looked

at recently funded (2008-2012) grant projects as a way of synthesizing a list of emerging trends in the industry (Table 2). Environmental sustainability topped the list of issues for which grant support was provided (six topics, 34 grants awarded). Examples included environmental impact of nursery production practices; biodegradable horticultural products, including biodegradable nursery containers; development of new stress-tolerant plants; improved, environmentally friendly container substrates; sustainability in landscape practices; and reducing pesticide use in nursery production. Projects having to do with monitoring and reducing the impact of invasive pests were also supported (eight grants awarded).

Table 2. Issues for which the Horticultural Research Institute provided funding (2008-2012)

Issue	Grants funded
Environmental impact of nursery production practices	10
Monitoring and reducing impact of invasive pests	8
Biodegradable horticultural products, esp. containers	7
Development of new stress-tolerant landscape plants / crops, including native plants	6
Improved nursery container substrates	5
Sustainable landscaping practices	4
Irrigation management in nursery production	3
Invasive plant / noxious weed prevention	3
Improving efficiency of container plant production	2
Reducing pesticides in bedding plant and nursery production	2
Marketing studies	2
Biopesticides from plants	1
Web-based garden center training	1

NEVADA GREEN INDUSTRY

Historical Perspective

Nevada’s rapid population growth and favorable economy in the decade from 1991 to 2001 allowed Nevada’s green industry to thrive. The green industry includes:

“Businesses that engage in production of plant materials sold through both wholesale and retail outlets; businesses which sell horticultural goods and supplies to businesses and end consumers; businesses that provide landscape services to businesses and residents; and golf operations that purchase goods and services from related green industry businesses” (Borden and Fletcher, 2003) (Table 3).

After examining data collected in 2002, economists Borden and Fletcher reported that Nevada's green industry total contribution to the State's economy was over \$1.3 billion. This contribution included over \$557 million in personal income that supported 21,197 jobs in Nevada (Table 3).

At that time, landscape services and golf courses accounted for over 87 percent of the industry's total economic activity (Table 4). Nursery and greenhouse crops ranked fifth in total agriculture sales in Nevada in 2002 (Borden and Fletcher, 2003) (Table 5).

Table 3. Nevada Green Industry Employment by Type of Business, 1998 and 2001 (Borden and Fletcher, 2003)

	1998	2001	Percent Increase
Plant Production	DNA*	DNA*	DNA*
Resale of Plants	897	1,136	26.6
Landscape Services	5,186	7,398	42.7
Golf Courses	2,607	3,288	26.1
Total	8,690	11,822	36.0

Source: County Business Patterns, U.S. Census Bureau

* DNA – Data Not Available

Table 4. Estimated Green Industry Summary Statistics, 2002 (Borden and Fletcher, 2003)

	Jobs (FTE)*	Payroll (\$000)	Sales (\$000)
Plant Production	176	4,727	13,560
Landscape Services	12,224	278,689	485,731
Plant Resale	703	14,452	93,823
Southern** NV Golf	1,856	44,645	129,395
Northern** NV Golf	777	12,960	28,937
Total Green Industry	15,736	355,742	751,447

*FTE – Full-time equivalent jobs (2,000 hours per year).

**Represents only operations directly associated with golf operations

Table 5. Estimated Economic Contributions, Nevada Green Industry, 2002 (Borden and Fletcher, 2003)

Industry Components	Direct Impacts	Secondary Impacts	Total Impacts
Production of Plants			
Economic Activity (\$)	13,560,000	8,176,008	21,736,008
Personal Income (\$)	4,727,000	3,154,956	7,881,956
Employment (FTE Jobs)	176.00	84.12	260.12
Landscape Services			
Economic Activity (\$)	485,731,000	358,466,347	844,197,347
Personal Income (\$)	278,689,000	128,327,604	407,016,604
Employment (FTE Jobs)	12,224.00	3,604.83	15,828.83
Resale of Plants			
Economic Activity (\$)	93,823,110	44,055,936	137,879,046
Personal Income (\$)	14,451,613	8,905,998	23,357,611
Employment (FTE Jobs)	702.70	238.76	941.46
Southern NV 58 Golf Courses			
Economic Activity (\$)	129,395,076	123,940,112	253,335,188
Personal Income (\$)	44,644,456	52,541,109	97,185,565
Employment (FTE Jobs)	1,856.00	1,289.69	3,145.69
Northern NV 41 Golf Courses			
Economic Activity (\$)	28,937,330	23,256,393	52,193,723
Personal Income (\$)	12,960,100	9,215,943	22,176,043
Employment (FTE Jobs)	776.95	243.66	1,020.61
Total Green Industry			
Economic Activity (\$)	751,446,516	557,894,797	1,309,341,313
Personal Income (\$)	355,472,169	202,145,609	557,617,778
Employment (FTE Jobs)	15,736	5,461	21,197

In 2009, Borden and Harris updated the information on Nevada’s green industry revealing continued industry growth due to rapid population growth, new residential construction growth and aggressive landscape regulations enacted and regulated by state and local governing agencies (Borden and Harris, 2009). They noted a decline in new residential building permits and attributed it to the slowdown of the world economy and subsequent slowdown in state and local economies. The authors concluded that, as of 2008, the industry was estimated

to contribute over \$1.8 billion in economic activity, including \$761 million in personal income, and supporting 24,073 jobs (Borden and Harris, 2009) (Table 6).

Table 6. Nevada’s Green Industry Economic Impacts (Borden and Harris, 2009)

NEVADA	Direct Impacts	Secondary Impacts	Total Impacts
Wholesale Nursery (NAICS # 42293*)			
Economic Activity (\$)	\$24,578,396	\$12,986,859	\$37,565,255
Personal Income (\$)	\$9,430,306	\$4,782,045	\$14,212,350
Employment (Jobs)	139.0	106.3	245.3
Retail Trade (NAICS # 44422)			
Economic Activity (\$)	\$106,299,568	\$53,450,232	\$159,749,800
Personal Income (\$)	\$44,060,620	\$18,550,116	\$62,610,736
Employment (Jobs)	1,200.0	439..3	1,639.3
Landscape Services (NAICS #56173)			
Economic Activity (\$)	\$764,654,720	\$404,809,282	\$1,169,464,002
Personal Income (\$)	\$327,513,152	\$138,117,434	\$465,630,586
Employment (Jobs)	13,027.0	3,286.5	16,313.5
Landscape Architect (NAICS #54132)			
Economic Activity (\$)	\$59,950,800	\$41,804,834	\$101,755,634
Personal Income (\$)	\$37,133,024	\$15,263,739	\$52,396,763
Employment (Jobs)	546.0	356.5	902.5
Golf (NAICS #71391)**			
Economic Activity (\$)	\$246,458,352	\$139,508,728	\$385,967,080
Personal Income (\$)	\$119,663,904	\$47,430,082	\$167,093,986
Employment (Jobs)	3,838.0	1,134.9	4,972.9
Total Green Industry			
Economic Activity (\$)	\$1,201,941,836	\$652,559,935	\$1,854,501,771
Personal Income (\$)	\$537,801,006	\$224,143,416	\$761,944,421
Employment (Jobs)	18,750.0	5,324.5	24,073.5

*North American Industrial Classification System

**Only golf-related activities (excluding retail, food and beverage)

By 2012, Nevada led the nation with the highest unemployment rate and the most home foreclosures for 62 months. One in every 115 households was in foreclosure (CNBC.com, 2012). In May 2012, the national unemployment rate was 8.2 percent, while Nevada’s rate was 11.6

percent, a drop from the previous rate of 14 percent (U.S. Bureau of Labor Statistics, 2012). The number of people unemployed in Nevada peaked in October 2010 at 193,578. Compared to 2010, 35,314 fewer people in Nevada are unemployed according to the U.S. Bureau of Labor Statistics (2012). While Nevada is slowly coming back from a devastated economy, the unparalleled economic crisis forced a decline in the green industry in 2010 from 2008 (Table 7).

Table 7. Nevada Green Industry Patterns Comparing 2008 to 2010 (based on data from U.S. Census, 2008 and 2010)

NAICS code	NAICS code description	Paid employees for pay period including March 12 (number)	First-quarter payroll (\$1,000)	Annual payroll (\$1,000)	Total establishments
42293	Wholesale Nursery	No data available 2010	No data available 2010	No data available 2010	No data available 2010
4442	Lawn and garden equipment and supplies stores	744* -205*	3,976 -1,939	19,673 -6,808	72 -6
44422	Nursery, garden center, and farm supply stores	681 -202	3,524 -1,901	17,763 -6,471	60 -6
54132	Landscape architectural services	No data available 2010	1,247 -2,509	4,977 -8,533	23 -14
56173	Landscaping services	6,714 -1,863	35,286 -16,526	180,839 -62,044	652 -64
713910	Golf courses and country clubs	3,356 -1,086	19,423 -4,820	90,801 -17,496	71 -11

*Data from 2010

**Change from 2008 to 2010

Nevada Green Industry Needs Assessments

The authors investigated an unpublished 2003 study completed by UNCE Western Area natural resource specialists, Horticulture Specialists and Extension educators to gain a historical perspective on Nevada green industry needs.

Survey results of key informants (N = 44; 80 percent response rate) indicated that the most compelling needs were water availability and management, water quality, and pest management, including invasive weeds. Under water management, drought planning and species selection for water use characteristics were important issues. Respondents felt that “ongoing contractor education to raise professionalism of industry” and “expanding educational offerings for residents in western Nevada” were important roles for UNCE. The top 10 results are listed in Table 8 (Donaldson et al., unpublished).

Table 8. Issues Rated By Community Key Informants in 2003 (Donaldson et al., unpublished)

Ranking	Issue	Number of Respondents Rating Issue	Mean Score (on scale from 1, most important, to 9, least important)
1	Drought planning	44	2.18
1	Species selection for water use	44	2.18
2	Educating the public on pesticide alternatives	42	2.31
3	Protecting ecologically sensitive areas from degrading impacts	43	2.35
4	Public education for water conservation	44	2.61
5	Groundwater contamination from leaching of chemicals, etc.	44	2.68
6	Plant establishment methods for rehabilitation and erosion control	44	2.73
7	Educating the public to ask for native and low water use plants	43	2.74
8	Invasive weed control, including conversion to desirable plants	44	2.75
9	Recycling of green wastes and biomass	43	2.79
10	Education about xeriscape (water-efficient landscaping)	44	2.82
10	Ongoing contractor education to raise professionalism of industry	44	2.82
10	Educated landscape designers who have knowledge of soil/plant/water relationships	44	2.82

A more recent northern Nevada needs assessment (N = 82; 22 percent response rate) implemented in 2008 by Allen (2009) found that the majority of respondents (43 percent) were green industry business owners. The highest-scoring needs they identified were:

1. Provide more education and training on irrigation practices in the high desert.
2. Resume soil testing and analysis.
3. Provide regionally specific information on invasive weeds and insects.
4. Provide easily accessible education and training programs for consumers on local horticulture practices.
5. Provide educational programs directed at the public regarding proper lawn and tree care.
6. Provide a monthly report of diseases, insects and other emerging horticulture issues.
7. Provide one central, easily accessible source for horticulture information.
8. Provide information about irrigation scheduling that is specific to soil types and plant types.
9. Provide Web-based information on local horticulture topics.
10. Provide landscape maintenance classes (specifically IPM and turf care) to small landscape maintenance businesses.

HORTICULTURAL NEEDS AT THE COUNTY LEVEL

In the years leading up to the economic collapse, horticulture-related needs had been broadly identified in countywide needs assessments by various UNCE Extension educators and faculty based in Nevada counties. Horticulture assessments by Extension educators were only one part of overall surveys rather than a specific focus.

Northern Nye County

In a 2002 UNCE needs assessment of northern Nye County residents (N = 75; 19 percent response rate), Suverly and Singletary reported that 6 percent of respondents listed horticulture as a “most important” program area; 30 percent listed it as “moderately important” and 64 percent listed it as “least important.” Table 9 illustrates how specific topics under horticulture were rated in northern Nye County.

Table 9. Percentage of responses for identifying level of need for program topics in northern Nye County (Suverly and Singletary, 2002)

	Low Need	Moderate Need	Needed	Don't Know
Lawn care	25	25	38	12
Water Conservation	8	25	58	9
Desert landscaping	8	24	59	9
Vegetable gardening	11	24	57	9
Fruit trees	8	29	54	9
Tree/shrub care	5	26	60	9
Composting	11	28	50	12

When Meier updated the northern Nye County Situational Analysis in 2006, compiling data from a variety of sources including stakeholder interviews, she reported the following:

“Horticulture rated fourth in program priority in northern Nye and Esmeralda counties. Community leaders and other members of the public indicated that there is a need for programs that teach strategies for home gardening, yard care and landscaping in high desert climates. Both beautification and efficient use of resources in yard and garden are of concern” (Meier, 2007).

Churchill County

Powell (2004) examined the needs of Churchill County residents in 2003 (N = 191; 52 percent response rate) (Table 10).

Table 10. Percentage of responses for identifying level of need for program topics in Churchill County (Powell, 2004)

Horticulture						
Horticulture has been identified in some communities as a very important component to enhancing the quality of life. On a scale of 1 to 5, with 1 being “doesn’t need” and 5 being “definitely needs,” please circle the number that best indicates the need for education on the following topics. If you “don’t know,” circle DK.						
	Doesn't Need				Definitely Needs	Don't Know
	1	2	3	4	5	DK
Gardening	4.9	10.3	33.5	24.9	19.5	7.0
Landscaping	4.3	8.1	29.2	28.1	23.2	7.0
Pest control	2.1	1.6	21.9	29.4	39.0	5.9

	Doesn't Need				Definitely Needs	Don't Know
Noxious weeds	2.7	1.6	20.3	21.4	46.5	7.5
Fugitive dust	5.4	3.8	25.4	25.4	28.1	11.9
Countywide beautification	4.9	4.3	21.6	23.2	37.3	8.6
Lawn care	6.0	7.7	28.4	30.6	20.8	6.6
Plant disease control	1.1	4.3	25.4	30.3	29.2	9.7
Fertilizer selection and use	4.3	5.9	28.1	28.6	23.2	9.7
Numbers denote percentages -						

Lincoln County

A needs assessment (N = 358, 17 percent response rate) in Lincoln County (east-central Nevada north of Clark County) by Rask (2005) revealed interest in horticulture and agriculture programs related to horticulture (Table 11).

Table 11. Interest in Education Programs in Lincoln County 2004 (Rask, 2005)

Programs	Attend class	Printed info	Do not want
Horticulture			
Trees & shrubs	32	53	15
Landscaping	37	48	15
Vegetable gardening	34	46	19
Lawn care	27	47	26
Master gardener	28	38	34
Agriculture			
Noxious weed control	22	47	31
Water quality	13	55	32
Pesticide application	16	45	39

Clark County

Clark County (primarily Las Vegas) is the largest county and urban area in Nevada. In a 2009 Quality of Life Analysis (N = 1,210; phone interviews), Ukeiley and Gallion found that 29 percent of respondents felt that *Having an adequate water supply* was a “major problem.” This was the highest rated issue in the “major problem” category. Concerning issues of importance to small towns in Clark County, responses were split between “not important” and “highly important” on the issue of *small acreage farming*. Finally, respondents occasionally reported *invasive*

weeds as a “major problem,” though the issue would sporadically be categorized as “not important” (Ukeiley and Gallion, 2009).

Pershing County

In Pershing County, Foster et al. (2010) investigated community needs (N = 332; 15 percent response rate) and found the issues listed in Table 12 to be most important to respondents from a horticulture perspective.

Table 12. Ranked Horticultural Issues for Pershing County, NV, 2009 (Foster, Singletary and Buk, 2010)

Horticultural Issues		
Rank	Issues	Mean
1	Learning how to properly use household and garden pesticides	3.48
2	Learning how to grow my own fruits/vegetables	3.41
3	Learning how to properly care and maintain lawns/landscapes	3.30
4	Learning how to select proper landscape plants	3.27
5	Learning how to diagnose indoor/outdoor plant problems	3.12
6	Learning how to organize a local farmers market	3.04
7	Learning how to grow organic foods	2.78

(Scale: 1= low priority, 2 = moderate priority, 3 = Neutral, 4 = moderate high priority, 5 = high priority)

When Pershing County residents were asked the open-ended question, “Please identify the horticultural issues that are most important to you and your family,” 7.5 percent (n = 25) needed “pest control information on how to control noxious weeds and insects,” 4.8 percent (n = 16) needed “information on soil, lawn and garden management” and 3.6 percent (n = 12) needed “information on xeriscaping” (Foster et al., 2010).

2011 Survey of Central-Northeast Counties

In June 2011, Kratsch visited and interviewed Central-Northeast Area Extension professionals in their counties to learn about county-level horticulture issues. They were asked to provide information on county horticultural issues, their existing programs to address those issues and ideas for collaborative programs that would support their horticultural efforts.

Questions were open-ended, and responses were grouped by similarity in theme. Season extension was a repeated theme (Table 13). Interest was also high in providing home food production and landscaping educational programs. Agricultural diversification was cited three

times, and there was some interest in workshops for small-scale food production. In most cases, staffing shortages prevented most Extension educators from providing a full complement of horticultural programs to meet county needs.

Table 13. Interviews with Central-Northeast County Extension Professionals (N = 9)

1. Horticultural Issues*	No. of times cited
Short growing season	4
Community/economic development	3
Home horticulture	3
Agricultural diversification	3
Poor soils	2
Landscaping/tree care	2
Food insecurity	1
Community gardens	1
Master gardener training	1
Insect pests	1
Irrigation	1
School gardens	1
2. Existing Programs that Address Horticultural Issues	No. of times cited
Season extension (hoop houses)	3
Plant problem diagnosis	3
Farmers market	1
Developing market for grapes	1
Street tree initiative	1
Small, active master gardener program	1
Possibly start a junior master gardener program	1
3. Possible Collaboration	No. of times cited
Grow-Your-Own-type program	5
Home horticulture/landscaping/xeriscaping	4
Small producer workshops	2
Newspaper articles	1
Junior master gardener program	1

*Conducted by face-to-face interviews

SUMMARY AND FUTURE DIRECTION

Despite budgetary constraints and staffing shortages within UNCE, the need for horticultural programs and education in the state remains high. Previous state and county needs assessments identified a role for horticultural education that continues to grow over time. Water conservation and education on pesticide alternatives have been rated highly by community informants in the past, and these issues continue to be important to both consumers and the green industry today. The economic downturn hit the green industry in Nevada hard, but it is recovering slowly. On the other hand, the economic downturn has shifted public interest to include a greater desire to grow their own food and to support local agriculture. In particular, there is a groundswell of interest in alternative food production methods more conducive to urban farming (Vanderhaar, pers. comm., 2012). Climate change has accelerated to the point that it cannot be ignored, and public awareness of environmental issues is high. Green industry businesses that can take advantage of these shifts in consumer interest and awareness have the greatest chance to survive and thrive in our new economy. These shifts also represent both a challenge to UNCE to provide continued high quality programming, and an opportunity to focus its efforts in areas of current and projected need.

Table 1 (pages 5 and 6) presents information on horticultural trends nationally, regionally, and locally from the perspective of both Extension professionals and client groups (the public and the green industry). We felt that comparing the perspective of Extension professionals with that of the public and the industry was important because of the inherent self interest and bias that can color any one person's view of the world. For example, consumers and industry professionals are naturally interested in issues of immediate concern to themselves or to their capacity to earn a profit. Each of us on a personal level tends to think about "what's best for me." As Extension professionals, we see issues from multiple angles and perspectives, and may have a broader view of the world (or at least of the county, area or state in which we work). Most of us read professional journals and attend regional, national or international conferences, which add to our global view. Of course, as professionals, we have our own biases, and our attitudes may be bounded by our particular area of interest or education. Finally, all of us tend to think retrospectively rather than prospectively. Our hope was to find areas of commonality among groups, to balance local needs with national trends and to learn about innovative approaches that could illuminate our way forward.

In that spirit, we propose a statewide emphasis on the following horticultural issues (in no particular order):

- Home and small-scale food production, emphasizing season extension methods where needed and alternative food production methods for urban areas. The overall goal is to decrease the incidence of food deserts in Nevada and to stimulate local economies.
- Support of community and school garden program efforts, with an emphasis on cross-disciplinary collaboration that will enhance the farm-to-school movement and support improved community health. Suggested collaborations may occur among nutrition, horticulture and 4-H program faculty and staff.
- Pest diagnosis and management. The emphasis nationally is on reduced-risk pest control products and practices.
- Climate-appropriate gardening and landscaping practices that will result in improvements in water quality, water conservation and protection of wildlife and pollinator populations.
- Programs to support green industry training, certification and licensing to foster economic recovery of the industry and to ensure the availability of adequately trained professionals that can serve as allies in educating the public. Collaboration with other agencies will likely be needed considering limited resources and budgetary constraints.

Programs at the county level may vary based on localized needs and available resources. Given budgetary constraints and dramatically reduced staff, consideration should be given to collaboration among UNCE professionals, disciplines and state and local agencies. This may require changes to program delivery methods and will require UNCE professionals to stretch themselves professionally by interacting with multiple disciplines. The difficulty in achieving this new normal should not be underestimated. Further, UNCE professionals should build flexibility into their programs to enable adjustments in response to a rapidly changing world. In the future, we (the authors) propose to perform a formal assessment of consumer and green industry horticultural trends nationally by conducting a survey of Extension professionals nationwide. We believe the needs of Nevada are unique, but there may be areas of shared interest regionally and nationally for which collaborative efforts may be undertaken. Such collaborations will strengthen UNCE's capacity to provide quality education using rapidly advancing platforms that may be even more effective in reaching out to our client base.

APPENDIX A

Food Deserts in Nevada by County (USDA Economic Research Service, 2012)			
Number	County	Census Tract Code	% of People with Low Access
1	Carson City	32510000600	26.5
2	Churchill	32001950300	38.2
3	Clark	32003001100	67
4	Clark	32003002300	99.1
5	Clark	32003002403	100
6	Clark	32003002601	100
7	Clark	32003002602	81.7
8	Clark	32003003700	32.2
9	Clark	32003004600	33.3
10	Clark	32003004707	100
11	Clark	32003004712	46.6
12	Clark	32003005703	97
13	Clark	32003005818	99.9
14	Clark	32003006201	100
15	Clark	32003003602	64
16	Clark	32003005010	21.7
17	Clark	32003002300	99.1
18	Clark	32003005421	100
19	Douglas	32005000600	92.9
20	Elko	32007950600	98.3
21	Lander	32015000100	54
22	Lyon	32019960200	47.9
23	Mineral	32021940200	100
24	Mineral	32021970400	51.7
25	Nye	32023980406	100
26	Washoe	32031940100	44.7
27	Washoe	32031002702	43.3
28	Washoe	32031001500	84.4
29	White Pine	32033970100	85.7

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