# WATER-SENSIBLE RESIDENTIAL LANDSCAPES: BUILDER VS. HOMEBUYER PREFERENCES FOR WATER CONSERVING URBAN RESIDENTIAL LANDSCAPES

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# Water – Sensible Residential Landscapes: Builder vs. Homebuyer Preferences for Water Conserving Urban Residential Landscapes

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## Background

Landscape watering has been estimated to use up to 50-70% of city water production during the summer months in the United States (Mayer et al., 1999; Kjelgren et al., 2000). Many citizens would consider landscape water use a low priority when compared with human consumption, health, safety, industrial, agricultural, and environmental quality uses. Yet, when citizens are asked to describe an ideal home, the majority will mention the importance of maintaining a nicely landscaped yard (Vickers, 2001).

Changing behavior patterns involves understanding economic motives, social customs, and traditional practices of both the builders who install turfgrass and homeowners who maintain or replace turfgrass in residential settings. Demand for urban water for residential use in new developments ultimately depends on builders' perception of buyers' demand for landscape type and desire for quick and cheap establishment of a lawn and plantings, whereas buyers in established neighborhoods may be more likely to adopt new conservation practices as part of refurbishing the existing landscape.

We survey homeowners and builders concerning landscape/turfgrass aesthetics and accompanying irrigation practices, how they make landscape irrigation decisions and assess willingness to pay, given probabilistic payback for, drought , cold, and pest tolerant, water conserving turf. We estimate differing willingness to pay amounts for builders and homeowners and differences in the favored attributes for adoption. In our study, the two potential groups, buyers and established builders, were given landscape turf type, rate structures, and water expenses.

## Objectives

- To assess willingness to pay by homeowners for drought tolerant grass cultivar and irrigation practices in Oklahoma urban and suburban areas using contingent valuation.
- To assess builders' perception of willingness to pay of homeowners for new sod at the sale of a newly constructed home.
- To quantitatively assess whether builders of new homes are motivated by different sod attributes than homebuyers.

## Methods

•June 2011, two surveys, one to potential Oklahoma homebuyers and two to homebuilders. Two convenience samples were used, Survey Sampling International's Oklahoma Consumer Panel and three homebuilder organizations in Oklahoma. The response rate for the homebuilder was approximately 6%.

•Probit Model Maximum Likelihood Estimation was used to obtain coefficient estimates.

•Median willingness to pay was calculated. This is the dollar amount that corresponds to a 50% likelihood that the respondent will say "yes" to the randomized bid offered (Madalla 1983). Bids were randomly assigned from $100 to $1500 as an increase in the house price for installation of improved sod at purchase.

•Attributes were ranked on a 10 point scale, a T test was conducted to test the null hypothesis that the difference in rankings between groups was zero.

## Results

**Table 1: Sample Statistics**

| | Homebuyer | | Builder | | |
|---|---|---|---|---|---|
| | **Mean** | **St. Dev.** | **Mean** | **St. Dev.** | |
| Bid | 826.00 | 388.25 | 650.00 | 399.23 | |
| Accept | 0.72 | 0.44 | 0.36 | 0.48 | |
| Age | 47.85 | 15.63 | 52.78 | 10.64 | |
| Female | 0.66 | 0.47 | 0.03 | 0.18 | |
| **Turf Attributes (1-10, increasing importance)** | | | | | Buyer-Builder |
| Green | 7.61 | 2.35 | 8.43 | 1.71 | -0.82 |
| Drought tolerant | 7.83 | 2.11 | 6.97 | 2.18 | 0.86 |
| Low Pest/Herbicide Use | 7.79 | 2.23 | 6.17 | 2.33 | 1.62 |
| Install Cost | 8.06 | 2.17 | 8.19 | 1.89 | -0.13 |
| Maintenance | 8.42 | 2.00 | 7.97 | 1.99 | 0.45 |
| Low Watering Effort | 7.94 | 2.29 | 7.85 | 2.13 | 0.09 |
| Environ-friendly | 7.70 | 2.28 | 5.19 | 2.45 | 2.51 |
| Native Plant | 7.32 | 2.40 | 5.10 | 2.53 | 2.22 |
| Low Reoccur Cost | 8.58 | 1.98 | 7.25 | 2.52 | 1.33 |
| | n=546 | | n=58 | | .90** AVG |
| | | | | | 1.11 STD |
| | | | | T | 2.432 |
| | | | | P | 0.022 |

**Table 2: Probit Max Likelihood Estimates**

| | Homebuyer | | Homebuilder | |
|---|---|---|---|---|
| **Parameter** | **Estimate** | **Error** | **Estimate** | **Error** |
| **Intercept** | 1.1741*** | 0.2525 | -0.0053 | 0.8740 |
| **BID** | -0.0003** | 0.0001 | -0.0007* | 0.0005 |
| **AGE** | -0.0031 | 0.0037 | 0.0042 | 0.0162 |
| **FEMALE** | -0.2820** | 0.1258 | -5.0929 | 0.0002 |
| **Likelihood ratio** | 9.688** | n=546 | 4.746 | n=58 |
| | ***, **, * denote 99%, 95, and 90% confidence levels | | | |

## Conclusions

•Perception by builders and buyers of willingness to pay for drought conserving sod differs.

• Median willingness to pay for drought tolerant sod with a 5 year payback period by potential homebuyers is $2490 at home purchase.

• Builders believe median willingness to pay for drought tolerant sod is only $215 in the home purchase, despite a given payback price.

•Willingness to pay for drought tolerant sod decreased significantly among female homebuyers, compared to males, but age was insignificant.

•Builder perceptions did not significantly differ by age or gender, however, few builders were female. Furthermore, builders were a very challenging group to survey or to accurately survey.

•Overall builders significantly differ from homebuyers in their desired turf attributes. Buyers value lower install and maintenance cost and effort, whereas builders value install cost and a green, lush appearance to the lawn at sale, as expected.

•The basic builder model had a poor fit due to the low n and low response rate. Future examination of buyer characteristics and Monte Carlo estimates to be conducted to statistically test the difference in willingness to pay between groups. Builders, nonetheless, misperceive a potential marketing opportunity to buyers in more robust , drought , pest and cold tolerant bermudagrass.

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