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Influence of Trees on Residential Property Values in Athens, Georgia (U.S.A.): A Survey based on Actual Sales Prices

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ABSTRACT

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A survey of the sales of 844 single family residential properties in Athens, Georgia, U.S.A., indicated that landscaping with trees was associated with 3.5%–4.5% increase in sales prices. During the 1978–1980 study period, the average house sold for about $38 100 (in 1978 constant dollars) and had five trees in its front yard. The average sales price increase due to trees was between $1475 and $1750 ($2869 and $3073 in 1985 dollars) and was largely due to trees in the intermediate and large size classes, regardless of species. This increase in property value results in an estimated increase of $100 000 (1978 dollars) in the city's property tax revenues.

INTRODUCTION

The monetary value of city trees is important to several interests. For individual homeowners, some value must be assigned to an injured or destroyed tree when a casualty deduction or insurance claim is filed. The value of a community's tree cover is important to local government in setting the appropriate level of expenditures for tree protection and maintenance. Urban forestry professionals have a long-standing interest in the dollar value contributed by trees, because such estimates make good arguments for maintaining municipal tree care programs. However, something more than "pulling numbers out of a hat" is required to make convincing arguments to the Internal Revenue Service, the insurance adjustor, or the city council. This paper, and an earlier article using the same data (Anderson and Cordell, 1985) provide further empirical evidence suggesting the approximate value of residential landscaping trees to a community (see Fig. 1).

Most of the benefits attributed to urban tree cover are difficult to translate into economic terms. Beautification, shade privacy, wildlife habitat, noise abatement, wind reduction, and soil protection are products that are difficult to

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Fig. 1. While trees may increase the value of the average residence by 3–5%, the exceptionally grand maples and oaks in front of these recently constructed houses may have increased their value by an even greater amount. One potential problem, however, is that older trees have fewer years of life left in them, and are harder hit by construction damage.

price. However, the value of at least some of these benefits may be captured in the property values for the land on which the trees stand. The value of a living tree is intimately associated with its site. (The exception, of course, is nursery stock, where a tree is severed from the land and sold apart from it.) Theoretically, any difference in price between two houses that are identical except for their tree cover should be due to the trees themselves. If a tree-shaded house sells for $5000 more than its treeless but otherwise identical twin, the trees would be "worth" $5000.

The problem, of course, is determining the true comparability of different properties, for land is unique and two properties will always differ in many ways, not just in tree cover. This paper presents the results of a survey of a large number of house sales in one community in the Piedmont region of Georgia, U.S.A. The approach taken in this research represents one of the two solutions to the comparability problem described in the next section.

LITERATURE REVIEW

The problem of finding comparable properties has been addressed using two basic strategies. The first uses hypothetical sales data. Descriptions or other representations of properties are manipulated so that the properties appear to differ only in their tree cover. People are asked how much they would be willing to pay for each property, and differences in the amounts suggested can be attributed to the differences in tree cover. In such studies comparability is tightly controlled, but there is a corresponding loss in the realism of the prices.

The second approach uses actual sales data, usually from a small number of houses in a limited context, such as a single subdivision. Important differences between the houses include not only tree cover but size, special features, location within the subdivision, and so forth. Regression statistics can sort out the different contributions to total sales price that are made by each of these factors, attributing a share of the variation to trees. Here "realism"

Fig. 2. Builders are aware of the increased sales price commanded by houses on wooded lots, and so have abandoned the practice of clearing all trees from a lot before construction begins. Only time will tell whether the trees remaining on this lot will survive the numerous stresses and abuses they suffer during the construction process.

is high but there is a corresponding loss in control over comparability.

For reasearch purposes, *both* kinds of studies are important. The hallmark of a sound empirical conclusion is that it is supported by results from a variety of different research approaches.

Direct control of comparability; hypothetical sales data

Several studies have involved experimental manipulation of tree cover on properties, affording direct or nearly direct control of comparability. For instance, Payne and Strom (1975) manipulated the "tree cover" on a landscape architect's scale model of undeveloped acreage, asking people to estimate the value of 12-acre parcels of such "land". The landform was identical in each condition, but the researchers explored various degrees of tree cover (0, 33, 67 and 100% cover) and various arrangements of the trees (concentrated in clumps or distributed evenly across the "land") by adjusting the scale model "trees" on the model base. The highest valued condition had 67% tree cover, distributed evenly across the parcel, with an average hypothetical value of $2050 per acre. When treeless, the "acreage" was valued at its lowest, averaging only $1493 per acre. Thus, Payne and Strom found that trees added approximately 30% to the value of undeveloped land, using hypothetical values.

The raw land constitutes only a fraction of the total sales price paid by the new homeowner, and a 30% difference in land values will be modulated to a smaller fraction of total property values after improvements are constructed. Nevertheless, if the developer gets $100 000 for a house on an unwooded acre, even a 2% advantage from a wooded lot would give him a return of $2000 for his $500 per acre increased investment in the wooded land. In two surveys of Georgia homebuilders, regarding their costs for preserving trees on wooded lots during home construction, Seila and Anderson (1982, 1984) found that builders unanimously reported homes on wooded lots sell for an average (estimated) 7% more than equivalent houses on unwooded lots (see Fig. 2).

Payne (1973) also explored the value added by trees to developed property, controlling the comparability of houses directly, but again using hypothetical values. In the early 1970's in Amherst, Massachusetts, Payne surveyed real estate appraisers and homeowners, asking their estimates of the price of essentially identical houses on differently landscaped lots. Payne had gone to great trouble to create a unique collection of sets of photographs, with each set depicting the "same" house on lots with different numbers of trees. Actually, the houses in each set were recently constructed houses that were close to identical in appearance. Payne enhanced comparability further by attaching brief, identical descriptive formats to each house in a set. His results showed that hypothetical sales prices were increased by an average of 7% (range 5–15%) for houses landscaped with trees. Payne was unable to examine actual sales prices because too few of the homes in his study had recently changed hands.

Statistical control of comparability; actual sales data

In this second group of studies, including the study reported in this article, comparability is approximated by statistically sorting out the influences of various characteristics of the properties. For example, Morales et al. (1976) examined 60 homes in Manchester, Connecticut, relating sales price to several factors including location, date of sale, size of house, number of rooms, and other features. They found that tree cover added an average of $2686 to the price of the houses, or 6% of the total sales price, a figure very close to Payne's estimate for Amherst homes. Morales achieved a higher degree of comparability by restricting his sample to only a few new subdivisions. Thus he was able to draw reliable statistical conclusions with only a small sample.

More recently, Morales et al. (1983) compared two different methods for determining the value of landscape trees on 60 recently sold, comparable houses in a single new subdivision in Greece, New York. Half of the houses had good tree cover, and half very little. Although the properties were roughly equivalent in size, number of rooms, age, garage capacity, and number of fireplaces, the houses on lots with good tree cover sold for an average of $9500 more than the houses on lots with little tree cover. Using the "Guide for Establishing Values of Trees and Other Plants" developed by the International Society for Arboriculture (ISA), the trees on wooded lots were estimated to average $6000 in value. The $6000 ISA-derived figure represents 10% of the sales price, while the $9500 amount is 17%.

Part of the discrepancy between the ISA- and the sales-based values in the Morales study may be attributed to a 63-square foot difference in the average size of the tree-covered and treeless houses. At the average selling price of the houses ($29.91 per square foot), this size difference would account for almost $1900 of the price difference. The authors also note that the lots with trees were located to the rear of the subdivision, another factor that may strongly influence property value. While Morales' figure of 10% is high compared with the average increase in Payne's study, it is well within the 5–15% range Payne noted.

Fig. 3. Simulation of MLS entry used in the study. The table below the photograph indicates that the house sold for $48 000 on 6 October 1985 after 28 days on the market, for cash. In 844 over a 3-year period, trees were associated with 3.5–4.5% increase in prices of single family houses.

62489	48 000	6/Oct./85	D28		CASH	GRAY
ADD 2210 S. Milledge Av.			BRS 3	BTHS 2½		MLS No. 62489
OWNER Anderson		PH 555-7636		VAC.10/85		APPT. No
TENANT same		PH	LB No	SIGN Y		KEY Agent
AREA 5	SUBDIV.		LOT 10	BLK C	SECT	
DEED BK No.	PG No.		PLAT BK	PG. No.	SQ. FT.	1848
LOT SIZE	3/4 acre				SEWER	City
CONST & STYLE Brick two story			BUILDER		WATER	City

FLR PLN	1	2	B	Fl.	STOVE Yes	Ref No	DRAPES No
LIV. RM.	X			v	D/W No	DISP Yes	GAR CARPT 2-car
DIN. RM.	X			v	WTR HTR Elect		TER BD No
BEDRMS		3		wd	STORAGE Yes		HEAT Gas A/C No
BATHS	1/2	2		v	UTILITY Yes		STM WDS Some
FAM. RM.	X			v	FENCE Backyard		AGE app. 24
LAUNDRY	X				DECK No	PATIO No	YEARLY TAXES app. $235
LN BAL.	$ 16 500				AS OF 9/85	@ 8 3/4%	YRS. REM. 15
LOAN WITH Standard Mort					LN No.		POSS. Immediate

New roof

SIMULATION OF MULTIPLE LISTING ENTRY

FIRM Grayson	PH 555-1933	ID No.
SLS AGT King	PH 555-1806	FD

A study with a large database

The study reported here also relies on statistical control to achieve comparability. Instead of restricting the sample to one or a few subdivisions, as Morales did, this study examined sales of all houses in a county-wide area, including houses from over 50 subdivisions, with a wide range of ages and house and lot sizes. Sales for 3 years, from 1978 to 1980, were included. This study has the greatest potential to address the basic question posed by urban forestry practitioners — what is the contribution of trees to property in my community? — because it encompasses all single family residential properties in the community, from older neighborhoods to subdivisions where construction was still in progress.

METHOD

In brief, this study used a database produced by a local real estate organization (see Acknowledgements). The data included more than 90% of residential sales in the period from 1978 to 1980. The realtors' materials provided a wealth of information about each unit sold, and included a photograph of the front of each unit, from which the number of trees in the front yard could be counted. All the information was coded for computer analysis as reported in the results.

The database

The Multiple Listing Service (MLS) of the Athens–Clarke County Board of Realtors publishes a quarterly "Final Sales Catalog", containing a written description and photograph of each house sold through an agent associated with MLS (see Fig. 3). It is estimated that more than 90% of residential property sales in the Athens–Clarke County area are included in these catalogs. A final sales catalog listing includes information on the price for which the unit was sold, financing arrangements, the length of time the property was on the market under its current listing, and the agency who sold the unit. The final listing also duplicated the comprehensive original description of each property as prepared by the listing agent, including information about age, size, floorplan, utilities, appliances, location, lot size, and special features of the property. In addition, most listings include a photograph of the property, taken by a photographer under contract to the MLS. The photographs were the source of information on the number of trees on the lots. The study used MLS catalogs for the 12 quarters covering January 1978 to December 1980.

Selection of cases

The catalogs included sales for surrounding rural counties, and also included commercial and multi-family residential properties. To be included in this study, listings had to meet three criteria.

(1) Location in Clarke County, which includes Athens. The surrounding rural areas were excluded.

(2) A single-family house with no income-producing appurtenances. Condominiums, apartments, homes with basement or garage apartments, and duplexes were excluded.

(3) Availability of information on final sales prices, the square footage of heated space, the size of the lot, the age of the house, and sufficient information about the floorplan to count the number of rooms in the house.

Of the 1519 single-family housing units sold in 1978–1980, 844 (56%) met our criteria. Houses lacking information on lot or house size tended to be the older homes, where the information from the original builder or subdivider had not been passed along to the current owners. Houses lacking photographs, on the other hand, tended to be very new houses, which the MLS photographer could not locate because street address numbers were not yet affixed, or which were sold before construction was completed.

Date coding

The author and trained assistants recorded 44 descriptive variables for each property included in the study (see Table 1 for a summary of the variables found to be important). Most of the information was taken from the written descriptions included for each listing. Tree cover information was taken from the photographs. These were small (1.5×3.5 inch), black and white, and not always clearly printed. Especially on lots crowded with small hardwood trees, the tree counts may have been somewhat inaccurate, underestimating the total number of trees. However, the photographs were adequate to enable counting of trees in each of six categories — two species groups (evergreen and deciduous) each subdivided into three size classes (small, medium, and large).

Data analysis

All analyses were made using the Statistical Package for the Social Sciences. Correlations were calculated to ascertain the extent to which the number of trees was associated with variations in other house, lot, and sale characteristics. Regressions were performed to sort out the different effects of house, lot, and tree variables on the selling prices of the properties.

Some data transformations were made prior to the analyses. The most important of these addressed inflation, which was running at a high level in the 1978–1980 period involved in our study, and was not addressed in our earlier report (Anderson and Cordell, 1985). To reduce the impact of inflation on our data, we calculated the average sales price per square foot for each quarter of each year. Using these averages, we adjusted the sales price data from the second quarter of 1978 on, so that after adjustment all quarters had the same average price per square foot as the first quarter of

TABLE 1

Descriptive statistics for house, lot, and sale variables used in regressions[1]

Variable	Average	Standard deviation	80% of cases fall between	
			(low)	(high)
Price for which house sold[2]	$38 102.80	$13 155.60	$23 860.30	$55 710.30
Price per square foot[2]	$ 22.41	$ 4.22	$ 17.21	$ 27.35
Size of house[3] (square feet)	1718	580	1100	2458
Size of lot (acres)	0.7	0.9	0.3	1.0
Age of house (years)	11.1	13.0	New	23
Number of rooms	9.4	1.8	7	11
Number of baths	2.0	0.6	1	2
Covered car storage (vehicles)	1.3	0.8	0	2
Amenities[4]	3.4	1.4	1	5
Fireplaces	0.6	0.5	0	1
Central air	(73% of houses had central air conditioning)			
Number of trees in front yard	5.1	4.7	0	12
Small trees	1.0	1.5	0	3
Large trees	4.1	4.4	0	10
Pines	2.8	3.6	0	7
Hardwoods	2.3	3.2	0	6

[1]For 844 houses where lot size, house age and floorplan were known.
[2]In 1978-constant dollars.
[3]Interior heated space.
[4]Number of fireplaces, plus one for each of the following, if present: dishwasher, disposal, stove, refrigerator, or deck.

1978. This gave us sales price data in 1978-constant dollars.

Other transformations consisted of aggregating some of the original variables. For instance, we took the individual variables used to code the presence of certain floorplan features — family rooms, utility rooms, laundry rooms, bedrooms, dining rooms — and added them up to make a single "number of rooms" variable. We also combined various amenity features into a single score by adding to the total number of fireplaces a "1" for each of the following included in a sale: stove; refrigerator; dishwasher; disposal; deck; porch.

RESULTS

The number of trees in the front yard of a house is fairly closely related to several other features of the property (Table 2). Most importantly, the number of trees shows a fairly strong positive correlation with selling price, meaning that larger numbers of trees are associated with houses that sell for more money. The correlation of 0.45 means that approximately 20% of the variability in price can be accounted for by tree cover *and* the other variables that correlate with tree cover, such as house size, number of amenities, and number of bathrooms. In other words, houses having more trees tended also to be larger and to have more desirable features, so that a substantial portion of the 20% price increase associated with trees must be attributed to other features.

Regression analysis goes beyond simple correlations and allows us to separate the various effects of tree cover, house size and quality, and lot size, yielding a better picture of the impact of trees on sales prices. We tried two different regression equations, one based upon the Morales et al. research cited above, and the other achieved by allowing the regression to proceed in the way that built the most accurate predictive model using all available variables. The equation based upon the Morales et al. research, applied to our 844 cases, looks like this.

Selling price	=	3021	(a constant)
(in 1978-	+	14	× square footage of house
constant	−	133	× age of house in years
dollars)	+	343	× total number of trees in front yard
	+	3649	× number of fireplaces
	+	1862	× lot size in acres
	+	1582	× capacity of carports and garages
	+	606	× total number of rooms

This forward stepwise regression accounted for 77% of the variance (adjusted R^2) in sales

TABLE 2

Correlations between tree counts and other house, lot, and sale characteristics[1]

Feature	Correlations[2] with		
	Total trees	Large/small	Hardwoods/pines
Sales price of house[3]	0.45	0.44/ 0.11	0.31/ 0.31
Size of house	0.30	0.29/ 0.09	0.22/ 0.20
Age of house	−0.26	−0.24/−0.11	−0.09/−0.25
Size of lot	0.20	0.19/ n.s.	0.20/ n.s.
Number of rooms	0.27	0.26/ n.s.	0.17/ 0.19
Number of baths	0.33	0.31/ 0.12	0.19/ 0.25
Car storage capacity	0.26	0.25/ n.s.	0.08/ 0.26
Number of amenities	0.40	0.37/ 0.16	0.25/ 0.29
Number of fireplaces	0.30	0.28/ 0.11	0.22/ 0.19

[1]Based on 844 cases where lot size, house age and floorplan were known.
[2]All reported *r*s are significant ($P<0.05$).
[3]In 1978-constant dollars.

prices. All coefficients reported were statistically significant ($P<0.05$). The regression is based on 844 cases where lot size, house age, and floorplan were known.

In a variation, we entered the numbers of pines and hardwoods separately into the equation. This alteration made very slight changes in the coefficients shown in the above model, but shows the influence of pines and hardwoods separately: instead of $343 for each tree, the model adds $376 for each hardwood, and $319 for each pine. The coefficients indicate that hardwoods are slightly more valuable than pines, but that each contributes substantially to property values.

A third equation resulted when we used the number of small trees and the number of intermediate and large trees separately. Again, most of the coefficients are only slightly changed, but this time intermediate and large trees add $382 each. Small trees did not enter the equation, indicating that their contribution to price was too small to be reliably detected by the regression.

This equation indicates that the $38 102.80 price of the average house in our study includes $1750 associated with the presence of the average number of trees, 5.1; or $893 and $871 for the presence of the average number of pines and evergreens, respectively; or $1566 for the presence of the average number of large and intermediate trees. We can convert these values to 1985 dollars, using the current average sales price of properties in the Athens area ($66 907). The price increase associated with trees in 1985 dollars would be $3073; or $1568 for the average number of hardwoods and $1529 for the average number of pines on the lot; or $2750 for the average number of intermediate and large trees.

Our second regression, using all of the variables recorded for this study, improved only slightly on the Morales-based equation reported above.

Selling price	=	855	(a constant)
	+	13	× square footage of house
	+	1702	× number of amenities
	+	1992	× lot size in acres
	+	2270	× number of bathrooms
	+	290	× number of trees on the lot
	+	1349	× capacity of carports and garages
	–	56	× age of house
	+	1181	if central air conditioning is present

This regression accounted for 79% of the variance (adjusted R^2). All coefficients reported were statistically significant ($P<0.05$). The regression is based on the same 844 cases as in the first model.

In this equation, too, we explored the effects of pines vs. hardwoods and of small vs. larger trees. This time, pines added $257 and hardwoods $333 each; and larger trees added $336 while smaller trees did not add anything to the price.

This equation also indicates that trees are associated with an increase in sales price, and similar to the first model, hardwoods are worth slightly more than pines, while it is only intermediate or large trees that contribute significantly to sales price.

To summarize, the average house in our sample sold for 3.5–4.5% more for having five trees in its front yard. This estimated increase is only slightly smaller than the estimates from previous studies, which have generally examined newer houses only. Our use of a wider age range of houses may account for the smaller increase we found here.

Caution in interpretation

To say that each tree in a front yard *causes* a particular dollar increase in the sales price of the house is not correct. The appropriate interpretation of the regression results is more limited: the trees are *associated* with the increases listed above. This distinction is important because some of the increase in sales price may be due to the occurrence of other features associated with front-yard trees, and not the trees themselves. Some of these other features may not have been included in our data set — the best example here is probably the side and back-yard trees, which we did not include in our data (see Fig. 4). Further, houses with many trees could also have more desirable features or be better built than houses that have fewer trees. The association can work the other way, also. In other words, the regression can also attribute to some other variable, such as an amenity like a fireplace, a portion of the value that is actually added by trees, since there was a statistical tendency for houses with fireplaces to have more trees. These interchanges among variables preclude statements about causation, and limit us to statements about association among the variables.

We also note that the relationship between sales price and number of trees may not be linear. Payne's (1973) study indicated that if the number of trees in the front yard exceeded 30, the relationship between trees and sales price actually reversed, with additional trees causing a drop in sales price. We had only a few houses in our sample with such a large number of trees, but our data indicated a similar effect.

Other results

In previous studies homebuilders reported that new houses on wooded lots sold more quickly than houses on cleared lots. As reported earlier (Anderson and Cordell, 1985) we examined the influence of trees on the length of time our study houses stayed on the market. For our collection of old and new houses, we found that time on the market was little influenced by any of the variables. In addition to the wide variation in age of the properties in this study, the lack of relationship of tree cover to time on the market may be due in part to the fact that financing arrangements by buyers affect market duration. Moreover, each time an exclusive listing contract is made with a realtor, the property is inserted anew into the MLS system. Thus, houses that were on the market for more than one 3- or 6-month exclusive listing period were not credited with earlier periods, further distorting the statistical relationship.

Fig. 4. Leaving trees in relatively undisturbed buffer zones between properties can enhance the value of the property while improving the chances that a tree will survive the construction process.

DISCUSSION

This study used regression statistics to differentiate among the many features contributing to the sales price of single family houses. Using this approach to solving the "comparability" problem, we were able to analyze a large number of actual sales of real estate. The results indicate that trees are associated with a 3.5–4.5% increase in the selling price of single family dwellings. Taking into account the differences in our methods, our results are quite close to the 7% price increase found by Payne (1973), and taking into account the wide range of properties we used, rather than a limited number of subdivisions, our results are also quite close to the 6% price increase in Morales' (1976) study. Our smaller estimate of the price increase may be attributed in part to the relative abundance of trees and other urban vegetation in most residential areas in Athens and surrounding areas.

Because trees are associated with price increases, they are also associated with an increase in the tax base of the community. We earlier estimated that trees may account for as much as $200 000 in tax revenues to local government in Athens, if properties were assessed at fair market value (Anderson and Cordell, 1985). Since assessments typically run low (perhaps at 50% of fair market value) it may be fairer to say that the contribution of trees is more nearly $100 000 in the case of Athens. This increased value has other important economic ramifications, for the real estate developers, brokers, and others who derive income from residential property sales.

An estimate of 5% as the average value that trees may add to a single family residence is in line with research using both direct and statistical strategies for controlling comparability. Interestingly, insurance policies reflect this figure as well. On a standard homeowner's insurance form, the total compensation for loss of trees, and other plants is limited to 5% of the insured value of the dwelling. The policy further imposes as $500 limit for any one tree.

There are other ways to assess the value of trees besides comparing sales (e.g. Kielbaso, 1971). For example, trees can be defined as worth what they cost. Some direct economic costs of trees can be readily determined. The median percentage of city budgets dedicated to "tree care" was 0.4% for 946 cities involved in one study (Giedraitis and Kielbaso, 1982). Significantly, our $100 000 estimate for the annual contribution of trees to taxes in Athens comprises 0.46% of the city's annual budget.

It bears repeating that the hallmark of a sound empirical conclusion is that it is supported by results from a variety of different research approaches. Placing the estimated value of trees at around 5% of the fair market value of a property would seem to be such a conclusion.

How far would we press this conclusion? The convergent results from Payne's, Morales', and our studies are drawn from communities in Massachusetts, New York, and Georgia. We would hesitate to assign a 5% value to the trees in communities in the Great Plains or the southwestern U.S. In these communities, most city trees are deliberately planted and live only because they are irrigated — often at considerable expense. Of course, there are commensurately fewer trees in communities like Tucson, Arizona, so that the 5% figure may in fact be valid. Without more empirical work, however, the 5% estimate should be restricted to the eastern region where it has been demonstrated.

Further, we would stress that our results concern "average" values for "average" properties. As such, they can provide a sound quantitive basis for planning at the community level. For the homeowner, however, a "best estimate" of 5% is only a starting point for an individual appraisal by an arborist. The total value of the property will limit the arborist's estimate, but his estimate will also reflect the species, size, condition, and location of the tree.

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REFERENCES

Anderson, L.M. and Cordell, H.K., 1985. Residential property values improved by landscaping with trees. S.J. Appl. For., 9: 162–166.

Giedraitis, J.P. and Kielbaso, J.J., 1982. Municipal tree management. Urban Data Serv. Rep., 14(1), 14 pp.

Kielbaso, J.J., 1972. Economic values of trees in the urban locale. Proc., The Role of Trees in the South's Urban Environment, 31 January–3 February 1971, Athens, GA, University of Georgia, Center for Continuing Education, pp. 82–94.

Morales, D., Boyce, B.N. and Favretti, R.J., 1976. The contribution of trees to residential property value: Manchester, Connecticut. Valuation, 23(2): 26–43.

Morales, D.J., Micha, F.R. and Weber, R.L., 1983. Two methods of valuating trees on residential sites. J. Arboric., 9: 21–24.

Payne, B.R., 1973. The twenty-nine tree home improvement plan. Nat. Hist., 82(9): 74–75.

Payne, B.R. and Strom, S., 1975. The contribution of trees to the appraised value of unimproved residential land. Valuation, 22(2): 36–45.

Seila, A.F. and Anderson, L.M., 1982. Estimating costs of tree preservation on residential lots. J. Arboric., 8: 182–185.

Seila, A.F. and Anderson, L.M., 1984. Estimating tree preservation costs on urban residential lots in metropolitan Atlanta. Macon, GA: Ga. For. Comm., For. Res. Pap. No. 48, 6 pp.