

# Segmentation of Customers of Horticultural Non-food Products in Southern Germany

## Segmentierung von Kunden im gärtnerischen Einzelhandel in Süddeutschland

Andreas Gabriel and Klaus Menrad

University of Applied Sciences of Weihenstephan-Triesdorf, Freising, Germany

### Abstract

*The paper aims to identify clusters of buyers of horticultural products (non-food sector) in Germany based on behavioral factors as well as to determine the relevance of the different discriminatory variables. Data were obtained from 320 face-to-face interviews conducted in Southern Germany. Cluster and discriminant analysis were used to analyze the data. Eight clusters of buyers of horticultural products are identified which show significant differences concerning their socio-demographic characteristics, purchase behavior and buying motives. Gender and the affirmation of the respondent to purchasing or non-purchasing bed & balcony or potted indoor plants are the most important discriminatory variables. The differing behavior and interests of the eight consumer clusters allows fine-tuning of marketing activities of horticultural products within the analyzed distribution channels. Traditional retail shops should aim to attract younger consumers in future. The paper extends previous consumer research by identifying consumer cluster for horticultural products based on behavioral factors.*

### Key Words

*market segmentation; consumer behavior; retail marketing; cluster analysis; discriminant analysis*

### Zusammenfassung

*Die vorliegende Studie unterteilt Pflanzekäufer in verschiedenen Einkaufsstätten in Süddeutschland anhand ihres Kaufverhaltens und ermittelt zudem die Relevanz der analysierten Unterscheidungsmerkmale. Die dazu benötigten Kundeninformationen wurden aus insgesamt 320 Interviews in Einkaufsstätten von Blumen und Pflanzen in Bayern und Baden-Württemberg gewonnen und mittels Cluster- und Diskriminanzanalyse ausgewertet. Die insgesamt acht resultierenden Käufergruppen unterscheiden sich signifikant*

*anhand bestimmter sozio-demographischer Merkmale, aber auch hinsichtlich des Kaufverhaltens und den Einkaufsmotiven der befragten Kunden. Es zeigt sich beispielsweise, dass das Geschlecht der Kunden sowie der Aspekt, ob Topfpflanzen regelmäßig eingekauft werden, charakteristische Gruppenunterschiede verursachen. Entscheidungsträger in traditionellen Einkaufsstätten von Blumen und Pflanzen, wie Einzelhandelsgärtnereien und Blumenläden, können das erlangte Wissen über die unterschiedlichen Verhaltensweisen und Interessen der Käufersegmente nutzen, um die Kundenansprache und ihr strategisches Marketing zu verbessern und zielorientierter an den für das Unternehmen interessanten Kundengruppen auszurichten.*

### Schlüsselwörter

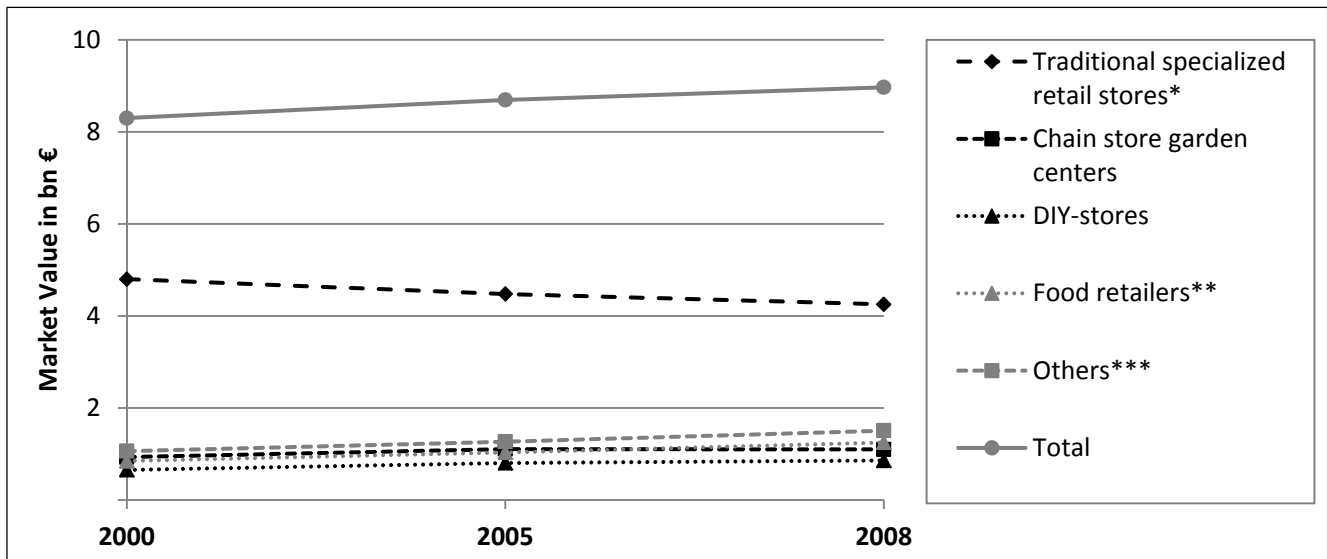
*Marktsegmentierung; Konsumentenverhalten; Einzelhandel; Einzelhandels-Marketing; Clusteranalyse; Diskriminanzanalyse*

## 1 Introduction

For decades, specialized traditional retail shops are in the leading position concerning the distribution of horticultural plants to private consumers in Germany. However, distribution channels outside the traditional retail stores for horticultural products like DIY-stores or food retailers have gained market shares in recent years (in particular with respect to cut flowers or bed and balcony plants). Furthermore, garden centers gained market shares in the German gardening market in recent years (Figure 1) which additionally increases the competition for mainly small-scaled traditional horticultural retail stores which often operate in a local or regional market.

Specialized traditional retailers for flowers and plants comprise different types of shops which are often not clearly defined and thus difficult to differentiate for

**Figure 1. Development of monetary market shares of important distribution channels for horticultural products in Germany**



\* traditional horticultural retail stores, specialized florist's shop, tree nursery

\*\* department stores, food discounter, hypermarkets, supermarkets

\*\*\* Additional percentages are sold in other distribution channels (e.g. weekly markets, internet and landscape gardeners' markets).

Sources: BRANDENBURG (2006), NIEHUES and UHL (2006), BEHR and NIEHUES (2009)

private consumers. While specialist flower shops have their focus on an assortment of flowers (in particular cut flowers), traditional horticultural retail stores (TRS) offer a broader assortment of plants (in particular bed and balcony plants, cut flowers, pot plants but also perennials, shrubs and trees) as well as gardening accessory. Often these TRS produce parts of their plants in own greenhouses or open-field production and sell them directly to (mainly private) consumers. A garden center (GC) is characterized by a sales floor of at least 800 m<sup>2</sup> and offers a broad assortment of plants as well as gardening accessory (BRANDENBURG, 2006). GCs serve the wish of many consumers to purchase all garden-related articles in one shop. Do-it-yourself-stores with affiliated gardening sections (DIY) are characterized by a sales area higher than 2,000 m<sup>2</sup> with gardening products with an emphasis on non-plant articles like substratum, decoration material, gardening tools and facilities for garden work (BRANDENBURG, 2006). Around 3,300 DIY-stores with gardening sections are found in Germany in 2009 (LERCH, 2009). Figure 1 displays the development of market shares of the main retail distribution channels for three considered horticultural product groups from 2000 to 2008. The decline of the shares of the specialized retail segment in favor of non-specialized channels is remarkable within this short period of 8 years for important product groups like cut flowers or potted plants.

## 2 Research Objective

So far there are hardly any empirical studies available, which aim to analyze and differentiate the customers of horticultural products in Germany in particular according to their place of purchase. A recent study analyses the US situation for floral products using consumer panel data from 1992 to 2005 to evaluate consumers' choice of different floral retail outlets (YUE and BEHE, 2008). In regular time intervals studies are published which analyze the distribution channels for horticultural products in Germany (ZMP, 2008; NIEHUES and UHL, 2006; BRANDENBURG, 2006). In addition, consumer panels (which are run e. g. by the GfK AG) give insight in the general purchase behavior with respect to horticultural products, but lack (at least publicly available) information concerning the structure, behavior and motives of the consumers purchasing horticultural products in the different types of outlets. Often the owner or manager of small-scaled, traditional retail stores argue that they know their customers due to the close (personal) contact to them, but only very few of these companies initiate and carry out a systematic analysis of their customers' behavior (HAU and LÖBKE, 2006). Against this background it is the target of this paper to identify clusters of buyers of horticultural products in Germany based on behavioral factors (in particular purchasing in different distribution channels) as well

as the relevance of the different discriminatory variables.

### 3 Methods

#### 3.1 Market Segmentation Approaches

Due to different conceptual approaches, many interpretations for 'market segmentation' can be found in scientific literature (FRETER, 1983). WEDEL and KAMAKURA (2000) use a pragmatic definition stating segmentation as a set of variables or characteristics used to assign potential customers or homogenous groups.

There are several methodologies that can be used for market segmentation, but especially multivariate analysis methods are able to solve questions of market segmentation (FRETER, 2008). The decision concerning a certain segmentation method is influenced by the aims of the analysis, the variables coherency, the scales of measurement, and the differentiation in a-priori and a-posteriori segmentation (FRETER, 2008; WEDEL and KAMAKURA, 2000). Combinations of methods are frequently used in scientific studies to fulfill specific aims of the segmentation analysis. SCHÜTTE (1990) compared several combined segmentation approaches of selected empirical customer-oriented case studies and analyzed the validity of the segmentation concluding that multivariate analysis methods like the cluster analysis are plausible approaches to analyze consumer segments and that these segmentation methods can be applied on many different kinds of questions.

#### 3.2 Recent Approaches of Consumer Segmentation Studies in Horticulture

There are few studies in scientific literature which recently used a consumer segmentation approach for horticultural products. A consumer survey in Pennsylvania at the end of the 1980s segmented the floral market based on volume and location of purchase thereby firstly conducting two discriminant analyses to determine the differences between floral consumer market segments based on the number of floral purchases and the primary location of purchases (BEHE and WOLNICK, 1991a). In a second step, the identified consumer segments are tested on several socio-demographic and behavioral criteria to differentiate the groups (BEHE and WOLNICK, 1991b).

In Germany, the quite topical study of KAIM et al. (2012) is aiming to analyze typology of more than

500 consumers of ornamental plants in Germany. This study is based on the work of ALTMANN (1984) who also used dynamic cluster analysis to group buyers of flowers and plants by their attitudes and motives of buying plants or using green services nearly 30 years before. KAIM et al. (2012) applied an upstream factor analysis that conducted nine factors, explaining attitudes of consumers towards different plant categories and their buying motives. Afterwards, the cluster analysis reveals six different types of consumers.

A study conducted in Australia at the end of the 1990s used the CHAID segmentation modeling approach to identify different groups of purchasers of floral products. This approach is a modification of AID segmentation that copes with categorical dependent variables (WEDEL and KAMAKURA, 2000). The study identified the fact whether the respondent of the survey has bought flowers to decorate his house or not as important criterion for defining different customer groups related to these products (OPPENHEIM, 2000).

HUANG (2005) analyzed the influence of different behavioral patterns and attitudes on consumers' floral purchase frequency in Taiwan. The surveyed consumer behavior and attitudes towards the purchase of flowers were first compiled by an upstream factor analysis to extract six principle determinants of the consumers like 'using flowers as daily essentials' or 'negative attitudes towards flowers'. Then a multinomial logistic regression model was used to analyze how the behavioral factors influence the stated purchase frequency of flowers.

KELLEY et al. (2001) used survey results and analyzed them via cluster analysis in order to determine meaningful customer segmentations by attitudes about edible flowers and salad consumption. A three-cluster solution was found to differentiate surveyed consumers according to their attitudes and identified differences in several variables like socio-demographics and product preferences.

The study of YUE and BEHE (2008) analyses the long-term US situation for floral products using consumer panel data from 1992 to 2005 showing that consumers' behavior differs significantly depending on the place of purchase. However, YUE and BEHE (2008) do not aim to identify specific consumer segments within their study which is the main target of this paper.

#### 3.3 Own Approach and Methodology

The basis for this analysis forms a survey among customers of horticultural products aiming to identify the

needs, behavior and motives of customers at different types of distribution channels for horticultural products in the federal states of Bavaria and Baden-Württemberg. For this purpose a standardized questionnaire was developed which covered the following aspects:

- Purchase behavior with respect to horticultural products;
- Selection of and satisfaction with different types of distribution channels;
- Purchase motives of buyers of horticultural products;
- Socio-demographic characteristics of the customers (including use of garden or balcony).

The questionnaire was adapted to the specificities of the three distribution channels but maintain an overall comparableness and general analysis of the surveyed questions. After pre-testing the questionnaire the survey itself was carried out via personal interviews with customers of three types of distribution channels of horticultural products by trained students. A total of 320 customers of horticultural products were interviewed in November 2006 in seven different shops in Southern Germany (Bavaria and Baden-Württemberg) in order to form the database for the purpose of this study. The interviewees were randomly selected by the interviewers. A total of each 100 customers were interviewed in TRS or DIY, respectively, and 120 customers in GC. The collected data was encoded and statistically analyzed.

After checking data quality and consistency via descriptive statistical analysis a hierarchical cluster analysis was carried out in order to identify homogeneous groups of customers of horticultural products. The following variables were used to identify the different groups of customers of horticultural products:

- *Characteristics of the customers:* age, gender, owning of garden, terrace or balcony;
- *General purchase behavior with respect to horticultural products:* buying frequency of horticultural products in general, annual expenditures for this purpose, demand of the different types of horticultural products and distance to the preferred shop for horticultural products;
- *Buying frequency of plants* in different types of shops (TRS, GC, DIY and food retailers);
- *Purchase motives* of buyers of horticultural products.

The store type, where the customers were interviewed during the survey, was not included as crucial variable in the cluster analysis. For selecting the variables used for the cluster analysis, it was considered that the varia-

bles should have a high relevance for the analyzed question and a small number of 'missing values' (BACKHAUS et al., 2006). Therefore, variables like e.g. the household income, which was often concealed by the interviewees, were not included in the analysis. In the rare cases that values were missing for the selected variables, they were replaced by average values in order to have a complete dataset for the cluster analysis. For variable groups with high correlation hazards (e. g. buying frequency of different product groups) weighting procedures were conducted. Respondents with several inapplicable variables were eliminated at the beginning of the analysis. At the end, the responses of 278 interviewed persons could be utilized for the clustering procedure (86.8% of the original dataset).

Conducting a hierarchical cluster analysis does not allow to investigate which of the exogenous variables influence the differentiation of the groups and to which extent. Therefore, a discriminant analysis (based on R.A. Fisher) was carried out which is able to differentiate nominal-scaled variables (like different consumer clusters) by a plurality of independent variables. For this study, the discriminant analysis should point out the discriminatory relevance of the included variables and consumer characteristics within the cluster analysis (BACKHAUS et al., 2006). As the number of groups should be minimized in a discriminant analysis, we did not consider all eight identified consumer clusters in the analysis but the three consolidated consumer segments composed by their stated preferred distribution channels, i.e. the traditional retail, the non-specialized retail or neither nor (for details see Figure 2). Following BACKHAUS et al. (2006), we used a step-wise discriminant analysis in which the single variables are included in the analysis according to their order of their quality criterion. Furthermore, this approach eliminates variables that do not make a significant statistical contribution to the discrimination.

## 4 Results and Findings

### 4.1 Socio-demographic Characteristics of Buyers of Different Distribution Channels

The age structure of buyers of horticultural products is dominated by persons of at least 50 years in particular in TRS since 73 % of them are older than 50 years. The average customer buying horticultural products in GC or DIY is slightly younger than those of TRS. Additional socio-demographic characteristics of the buyers

**Table 1. Socio-demographic characteristics of buyers of horticultural products**

Distribution channel	Age structure: Share of customers > 50 years	Average net household income (per year)	Average number of persons in the household	Share of female customers
Traditional retail stores	73 %	2,524 €	2.3	79 %
Garden centers	63 %	2,412 €	2.5	75 %
DIY-stores	65 %	2,275 €	2.6	68 %
Total	67 %	2,406 €	2.5	74 %

Means and frequencies are significantly not different according to ANOVA analysis ( $p \leq 0.05$ ) and Pearson ( $p \leq 0.05$ ).  
Source: own calculations based on data collected by KITTEMANN (2007)

of horticultural products only reveal small and statistically non-significant differences between the three analyzed distribution channels (Table 1).

#### 4.2 Purchase Behavior of the Buyers of Horticultural Products

Regarding the buying frequency of horticultural products, the customers of TRS more frequently purchase horticultural products than those preferring GC or DIY: 34% of the customers of TRS come at least once a month in these shops and an additional 14% buys horticultural products every week (Table 2). In all three analyzed distribution channels 40% or more of the interviewed persons buy horticultural products every three months.

In average the customers of TRS spend 304 € per year for horticultural products which is higher than the spending in DIY (267 € per year) or GC (234 € per year) (see Table 2). Customers spending between 100 and 300 € per year for horticultural products represent the biggest group in all three analyzed distribution channels while ‘heavy users’ of these products (with an annual spending higher than 300 €) are 41% of the customers of TRS compared to only 27% of those buying mainly in GC.

#### 4.3 Consumer Segments of Buyers of Horticultural Products

A hierarchical cluster analysis was carried out in order to identify homogenous segments of customers of horticultural products which results in eight clusters of buyers of horticultural products which are shortly characterized in Table 3.

By using the arithmetic mean of specific variables characterizing the customer segments, four fields can be constructed in which the eight identified customer clusters are placed (Figures 2 and 3).

Taking into account the preference of the different customer groups with respect to purchasing in a specific distribution channel (as shown in Figure 2), the buyers of horticultural products can be distinguished in three consolidated consumer groups (MENRAD and GABRIEL, 2010):

1. SR: one group consists of consumer clusters that prefer to buy in specialist shops (such as TRS, GC) which are named as ‘heavy buyer in traditional retail stores’, ‘traditional all-in-all buyer’ and ‘apartment greener’. Altogether the clusters in this group accounts for almost 40.9% of all buyers of horticultural products and 55.4% of the expenses for these products.

**Table 2. Buying frequency of customers of horticultural products**

	Traditional retail stores (TRS)	Garden centers (GC)	DIY-Stores (DIY)
<b>Stated buying frequency<sup>1)</sup></b>			
Weekly	14%	3%	5%
Monthly	34%	28%	31%
Less than once a month	52%	69%	64%
<b>Annual expenditures for flowers and plants<sup>2)</sup></b>			
Up to 100 €	17%	21%	24%
101€ to 300 €	42%	52%	40%
More than 300 €	41%	27%	36%
Average expenditures	304 €	234 €	267 €

1) The distribution of buying frequencies shows a significant correlation by the type of store for  $p \leq 0.05$  (Cramer-V. 0.185).

2) Frequencies are significantly not different according to Pearson ( $p \leq 0.05$ ), means of expenditures between customers of TRS and GC are significantly different ( $p \leq 0.05$ ).

Source: own calculations based on data collected by KITTEMANN (2007)

**Table 3. Customer segments of buyers of horticultural products and their characteristics**

Customer segments	Share customers in %	Annual expenses in % of total sample	Specific characteristics
'Heavy buyer in traditional retail stores'	6.1	12.2	Purchases every week almost exclusively in TRS, buys all product groups above average, very much interested in events and personal advice, by far highest income of all segments
'Traditional all-in-all buyer'	20.8	28.9	TRS are preferred, buys all types of horticultural products on a high level, high income, above-average proportion of women
'Apartment greener'	14.0	14.2	Buys mainly in TRS in particular bed and balcony plants as well as pot plants, request for personal advice, above-average in age
'Event buyer'	19.7	10.5	Low purchase in total, strong reaction on specific events and promotion activities, buys in particular flowering plants, relatively young in average
'Garden builder'	10.0	8.2	Typical buyer in supermarkets and DIY, interested mainly in outdoor plants, drives long distances to the store to buy horticultural products
'Men's domain'	12.5	14.0	Low plant buying frequency, buys mainly flowering plants (e.g. as a gift), not interested in events during purchase, almost only men are included in this segment
'Low-interest customer'	8.2	5.7	Has the lowest purchase frequency of all segments, in case of purchase one-stop-shopping preferred in GC or DIY, not interested in promotion activities, below-average in age
'Rare buyer'	8.6	6.2	Does not prefer a specific distribution channel, low interest in plants, buys rarely plants or flower but high monetary expenses per purchase

Sources: own calculations based on data collected by KITTEMANN (2007), MENRAD and GABRIEL (2010)

- NSR: a second group consists of consumer clusters that prefer to buy in non-specialist shops for horticultural products (such as food retailers or DIY) which are named as 'event buyer' and 'garden builder'. These clusters account for 29.7% of all buyers of horticultural products and 18.7% of the annual expenses referred to all consumers.
- NN: a third group is characterized by the fact, that the members of these clusters do not prefer a specific distribution channel for purchasing horticultural products or rarely buy such products. These clusters are named as 'men's domain', 'low-interest customer' and 'rare buyer' and they account for 29.4% of all customers and 25.9% of the annual expenses for horticultural products.

All corresponding clusters of the first group (SR) who prefer to buy horticultural products in specialist shops show above-average expenses for this type of products what is true in particular for the 'heavy buyer in traditional retail stores' with average expenses for flowers and plants of 547 € per year compared to 272 € per year for the entire sample. In addition, two of these customer segments have an average monthly income above 2,600 € (Figure 3). Taking into account the high expenses of these customer segments, it is not surprising that in particular the 'heavy buyer in tradi-

tional retail stores' show a very high (i.e. weekly) purchase frequency for horticultural products and the buyers belonging to this cluster as well as the 'traditional all-in-all buyer' ask for all type of horticultural products (seen in Table 3).

Both customer clusters belonging to the second group (NRS) who prefer buying horticultural products in non-specialist distribution channels show annual expenses for purchasing horticultural products clearly below average (Figure 3) not least due to their below-average monthly income. While the 'event buyer' is mainly interested in flowering plants and shows high interest in special offers and promotion activities, the 'garden builder' is more interested in outdoor plants and willing to drive long distances for getting the preferred plants (Table 3) resulting in high total expenses for horticultural products for the latter segment.

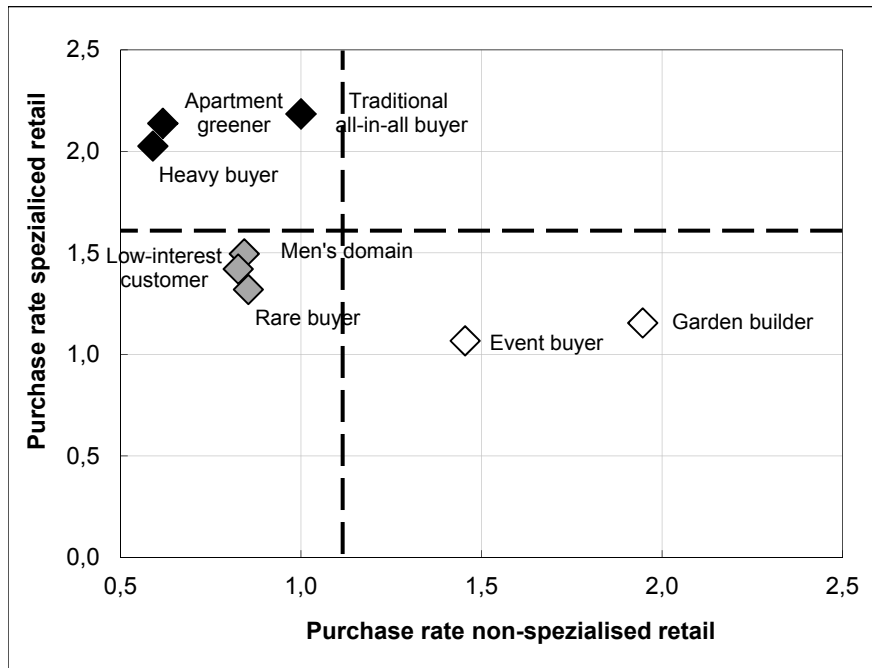
The third group of customers (NN) does not show any specific preference for a particular distribution channel of horticultural products. The members of the three clusters belonging to this group are characterized by a generally low interest in plants or flowers resulting in low purchase frequencies for horticultural products (Table 3). Additional similarities could not be extracted for the three included customer segments during the statistical analysis. The mainly male

'men's domain' buyer prefers flowering plants and is willing to spend an above-average sum of 302 € per year for horticultural products despite his relatively

low income. This behavior can be explained if it is considered that men often buy flowers as a gift. For this purpose the 'men's domain' buyer shows a low frequency of buying horticultural products, but spends a relatively high sum per purchase when he gets in the situation to purchase plants with defined quality for his gift.

The relatively young 'low-interest customer' also has a monthly income below average and the lowest purchase frequency for horticultural products of all eight identified clusters. The members of this segment are mainly interested in an easy and 'convenient' one-stop shopping in large-scale GC or DIY and do not expect specific promotion activities when purchasing horticultural products (Table 3). In contrary to these two clusters, the 'rare buyer' has a clearly above-average monthly income of around 2,900 € but spends only 198 € per year for horticultural products (Figure 3).

**Figure 2. Customer segments characterized by the rate of purchase in the different distribution channels**



Purchase rate: '3' = 'often' to '0' = 'never'; rhombus description: black = specialized retail (SR) preferred, white = non-specialized retail (NSR) preferred, grey = neither/nor (NN). Source: own calculations

**Figure 3. Customer clusters characterized by income and annual expenses for horticultural products**



Rhombus description: black = specialized retail (SR) preferred, white = non-specialized retail (NSR) preferred, grey = neither/nor (NN). Source: own calculations

#### 4.4 Results of the Discriminant Analysis

In order to investigate the discriminatory relevance of the independent variables used during the cluster analysis, a stepwise discriminant analysis was carried out in which the three consolidated groups of customers (SR, NSR, and NN) of horticultural products have been considered. At this point it is meaningful to affirm again that the foregoing division of customers in the three different places of the survey is not equalized with the subsequent segmentation of the three groups of customers. This matter of fact is comprehensible as all surveyed questions referred to the general plant buying behavior of the respondents and are not allocated to the actual places where the questioning was conducted.

The standardized coefficients for the used discriminant variables in the resulting two discriminant functions show that 11 of the originally used 22 cluster variables significantly contribute to the improvement of discrimination of the three consolidated consumer segments (Table 4). The consideration of the Eigen-values of the two functions df1 and df2, which represents the quality criterion of the optimal (df1) and sub-optimal function (df2), expose the importance of each variable for the discrimination of the three groups. Thus, gender (54%) followed by the statement of the respondent to purchase or not purchase the two top-selling horticultural product groups bed & balcony and potted indoor plants (54% or 51%, respectively), are the most important variables that influence the discrimination of the three consumer segments. Some variables like e.g. age of the respondents or the total expenditures for flowers and plants show no significant contribution to the improvement of the discrimination and were eliminated by the discriminant analysis model.

The predictive validity of the discriminant equation was checked by its capability to classify the respondents on the basis of the three identified consumer groups. The 'hit rate' of the sample, i.e. the correct classification of the respondents, is determined with 86.4% compared to a randomized classification of the respondents in the three groups for which one would expect a homogeneous distribution according to the group sizes (around 33% for each of them). Thus, the discriminant analysis succeeded in identifying those variables, which are mainly responsible for the dis-

crimination of the three consumer segments identified during the cluster analysis.

## 5 Discussion

Previous scientific studies give differing and partly contradicting information concerning the socio-demographic characteristics of buyers of horticultural products often depending on the cultural and country context. The superior number of female buyers of horticultural products in our sample is supported by a series of studies in different countries (e. g. YUE and BEHE, 2008; SCHMAHL, 2008; POSODAS et al., 2006; MENRAD and HARDUNG, 2006; MENRAD and FINK, 2005; BATT and POOL, 2004). The same relates to the majority of buyers of horticultural products aged 50 years or more in Germany (MENRAD and FINK, 2005; FINK, 2004). In other countries it could also be shown, that the buyer of horticultural products is more often female, older and more educated than population average and that they have an above-average income. This is e.g. true for a survey among Mississippi consumers of cut flowers (HUDSON and GRIFFIN, 2004) or for customers of traditional horticultural retail stores in Austria (GÖTTL, 2007), while e. g. in Taiwan purchasers of flowers are younger compared to the other countries (HUANG, 2005 and 2007). The same relates to buyers of perennial bushes in Switzerland (MENRAD and HARDUNG, 2006).

Scientific studies carried out in other countries show differences in the distribution structure of horti-

**Table 4. Results of the stepwise discriminant analysis**

Function: Eigen-value (Variance in %):	df1 <sup>a</sup>		df2 <sup>b</sup>	
	64.9		35.1	
Characteristics:	Standardized Coefficients		Importance of discrimination	Level of significance
Gender	.769	.129	0.54	0.000*
Buying frequency bed&balcony plants	.717	.201	0.54	0.000*
Buying frequency of potted indoor plants	.633	.323	0.52	0.000*
Buying frequency of plants in supermarkets	.285	-.436	0.36	0.000*
'Marketing actions influence my buying behavior'	.249	-.362	0.31	0.000*
Buying frequency of trees and shrubs	-.249	.187	0.23	0.001*
Owning a garden	-.201	.239	0.21	0.000*
Buying frequency of plants in TRS	-.043	.514	0.21	0.000*
Buying frequency of flowers and plants in general	.061	.337	0.16	0.000*
Buying frequency of plants in flower shops	-.033	.323	0.13	0.000*
Distance to the point of purchase	-.006	-.299	0.11	0.004*

<sup>a</sup> Function 1:  $\chi^2 = 438.66$ ;  $df = 22$ ; significance = 0.000; Canonical correlation = 0.79; Eigen-value = 1.66; Wilk's lambda = 0.198; Group centroids; SR (0.44), NSR (1.29), NN (-1.91).

<sup>b</sup> Function 2:  $\chi^2 = 173.70$ ;  $df = 20$ ; significance = 0.000; Canonical correlation = 0.69; Eigen-value = 0.90; Wilk's lambda = 0.527; Group centroids; SR (1.01), NSR (-1.10), NN (-0.40).

\* Difference of Group mean value: significance at  $\alpha < 0.05$ .

Source: won calculations



cultural products as well as for the reasons why consumers select a specific distribution channel. A survey conducted 1996 in Athens showed that 90% of the respondents bought fresh flowers from flower shops, while 65% used open markets and around one third GC for their purchases. The most important factor that influenced the respondents' decision to select a specific store type was the quality of the plants ahead of the variety of the assortment whereas the price of the products and the existence of non-plant products did not play a crucial role (BAOURAKIS et al., 2000). HUANG (2007) could show in a study for Taiwan that also the purpose of the use of the plants is relevant for consumers' choices of different stores. While self-users of flowers preferred the traditional flower markets as main retail channel, gift users of flowers more often used other distribution channels. In this context the availability of a delivery service and store reputation were the most discriminating factors among these two groups of flower users (HUANG, 2007). In contrary, the analyzed impact factors in our study that refer to purchase motives, product quality and purposes of use do not emerge as discriminating variables as they do in the studies of BAOURAKIS et al. (2000) and HUANG (2007) which both used a different methodological approach for their characterization of consumers of plants.

So far no study could be identified in scientific literature which aimed to segment the buyers of horticultural products mainly according to the preferred places of purchase as well as the purchase behavior related to horticultural products. However, recent investigations of consumer behavior in different countries give some insight in differing consumer segments at retail level. BEHE (1985) divided the market of US supermarket floral customers into five segments which show differences in socio-demographic characteristics, buying frequency and use of the flowers. A study in Pennsylvania at the end of the 1980s segmented the floral market based on volume and location of purchase (BEHE and WOLNICK, 1991a, b) and found two consumer segments namely heavy 'fresh flower consumers' and 'flowering plant consumers' (BEHE and WOLNICK, 1991a). A previous consumer survey in Taiwan could show that consumers who prefer different types of floral products and who differ in the intensity of the use of floral products varied significantly in terms of the consumption values for this type of products (YEH and HUANG, 2009; HUANG and YEH, 2009).

Consumer panel data from 1992 to 2005 show that box stores gained market shares in the US floral market at the expense of traditional freestanding floral

outlets. Consumers of the different distribution channels in the USA showed differing consumer behavior and have differing motives to buy in the respective shops: for box stores and general retailers convenience aspects and lower prices are major aspects while consumers who purchase from traditional floral outlets and direct-to-consumer channels mention delivery services, shop reputation and service activities as major drivers (YUE and BEHE, 2008). In this respect the results of our survey are partially comparable to the findings of YUE and BEHE (2008), in particular regarding the purchase motives in TRS. The difference of the studies of ALTMANN (1984) and KAIM et al. (2012) to this instant paper is the choice of utilized clustering variables. While both studies focused on a catalogue of selected statements of consumers' motives and attributes concerning green products, we incorporated additional information on effective buying behavior and socio-demographic characteristics as critical variables in our cluster analysis. Therefore, a direct comparison of the customer clusters including their different characteristics across the studies is not reasonable.

Altogether, the results of our survey reveal different socio-demographic characteristics as well as purchase behavior of the identified eight consumer clusters for horticultural products in Germany. Furthermore, it could be shown that in particular the gender of the respondent as well as the fact whether the person buys (or not buys) bed and balcony plants or potted indoor plants are important discriminatory factors for consumer segmentation.

## 6 Managerial Implications and Conclusion

The findings of this study have important market implications. The results of the study can be used for marketing of horticultural products in particular in TRS. Managers and owners of retail outlets for horticultural products can use the information concerning the identified consumer clusters for horticultural products and the behavior and interests of its members to better fine-tune their own marketing activities depending on the consumer clusters which are relevant for their sales outlets.

If the own customers can be identified and allocated to certain segments, their preferences and requirements can be addressed more specifically. For example, the management of TRS should calculate and invest some time in members of the 'heavy buyer' cluster

who show a high interest and purchase frequency (with above average expenditures) in plants but have also high expectations with respect to plant quality, personal advice, and the general purchase atmosphere (MENRAD and GABRIEL, 2010). It is crucial to fulfill the needs of these customers in order to satisfy them in future, since they form an important customer base of many TRS. In contrary, the 'rare buyer' is focused on 'convenient' shopping and not interested in intensive personal advice. Such a customer does not expect special events or plant arrangements in the shop (MENRAD and GABRIEL, 2010), but should be informed according to the personal needs before entering a shop to buy horticultural products. Despite its actual behavior the 'rare buyer' might be an interesting customer segment for specialist shops in future due to the fact that this customer segment is the 'youngest' cluster thus allowing long-term business activities if such a customer can be convinced. In addition, the 'rare buyer' shows high spending per purchase of horticultural products (Table 3).

Considering all three analyzed distribution channels in horticultural retail there is a significant percentage of customers older than 50 years (Table 1). An important reason for this fact is the social and economic background of this population stratum. Most people aged under 50 years do not have 'free' purchasing budgets (in particular if they have children), emphasize saving and retirement arrangements or they are limited in time, capacities or interests to busy themselves with plants and gardening activities. However, the consumer segmentation model of this study incorporated several demographic, socio-economic and behavior-based variables besides the indication of age. Thus, the composition of the identified consumer clusters is not just a matter of age and might remain stable when currently younger age groups reach the identified average ages of the consumer clusters. Therefore, the characteristics of the analyzed clusters and their differing importance for the three distribution channels should not only be used as a short-term picture but offer longer-lasting insights for strategic marketing management.

In general, customers of TRS seem to be more quality than price-oriented. Management should focus its marketing activities to underline the specific quality of the assortment, the personal advice and in particular specific service activities which often are not offered from GC or DIY. For the latter two distribution channels, marketing activities should be focused on improving quality of plants and availability of person-

nel and a better quality of personal advice. These two aspects have on the one hand a significant cost dimension (which might prevent that they are realized unless the increasing personnel costs can be compensated by higher sales) and on the other hand they have an educational dimension as in Germany the current education schemes for apprentices in the 'green industry' often do not include plant specific knowledge so that personnel lacks this type of knowledge in daily business.

Finally, lead to future research can be derived from HALL (2010) who stated that the green industry should position itself in such a way that the consumer recognizes the offered products and services as necessities for a higher 'quality of life' and not as 'pure luxury'. HALL (2010) confirmed the impact of flowers and plants for a higher quality of life and the additional emotional and environmental benefits which are demonstrated in many previous studies (e. g. improvement of emotional health, improvement of economic value of houses). Although the different generations and lifestyle cluster display discriminative values and preferences the superior necessity of 'higher quality of life' is omnipresent. For each of these population segments the achievement of this standard can be succeeded by different functions, utilities or styles (HALL, 2010). In this context future consumer segmentation research should not only focus on demographic, socio-economic and behavior-oriented attributes, but are advised to consider lifestyle and value elements to characterize the customers in horticultural retail.

## References

- ALTMANN, M. (1984): Konsumententypologie auf dem Zierpflanzenmarkt. Forschungsberichte zur Ökonomie im Gartenbau (47), Hannover and Weihenstephan.
- BACKHAUS, K., B. ERICHSON, W. PLINKE and R. WEIBER (2006): Multivariate Analysemethoden – eine anwendungsorientierte Einführung. Springer, Berlin.
- BAOURAKIS, G., D. GERASOPOULOS, N. KALOFOLIAS, N. KALOGERAS and A. ZOUMIS (2000): Marketing research – the case of floral products. In: *Acta Horticulturae* 541: 227-232.
- BATT, P.J. and J. POOL (2004): Consumer preferences for cut flowers in Western Australia. In: *Acta Horticulturae* 655: 81-88.
- BEHE, B.K. (1985): A market segmentation of supermarket floral product consumers based upon factors impacting the floral purchase decision. Master thesis. Ohio State University, Columbus.
- BEHE, B. K. and D.J. WOLNICK (1991a): Market segmentation of Pennsylvania floral consumers by purchase

- volume and primary retail outlet. In: *HortScience* 26 (10): 1328-1331.
- (1991b): Type of floral product purchased and demographic characteristics and floral knowledge of consumers. In: *HortScience* 26 (4): 414-416.
- BEHR, H.-C. and R. NIEHUES (2009): Markt und Absatz. In: Dirksmeyer, W. (ed.): Status quo und Perspektiven des deutschen Produktionsgartenbaus. vTi- Landbauforschung, Sonderheft 330, Braunschweig: 69-98.
- BRANDENBURG, H. (2006): Branchenreport Garten – Jahrgang 2006. BBE- Unternehmensberatung, Köln.
- FINK, C. (2004): Erwartungen von Endverbrauchern beim Kauf von Gartenartikeln: Was erwartet der Kunde, was bietet der Handel? Diploma thesis. FH Weihenstephan, Freising.
- FRETER, H. (1983): Marktsegmentierung. Kohlhammer, Stuttgart.
- (2008): Markt- und Kundensegmentierung. 2<sup>nd</sup> edition. Kohlhammer, Stuttgart.
- GÖTTL, M. (2007): Kundenbindung und Kundenzufriedenheit in österreichischen Einzelhandelsgärtnereien auf Grundlage einer Kundenbefragung in 18 österreichischen Gärtnereien. Diploma thesis. FH Weihenstephan, Freising.
- HALL, C.R. (2010): Making cents of green industry economics. Workshop proceedings. In: *HortTechnology* 20 (5): 32-35.
- HAU, D. and A. LÖBKE (2006): Die richtigen Kunden finden. In: *Deutscher Gartenbau* 2006 (34): 36-38.
- HUANG, L.C. (2005): Floral product behaviors and their influence on consumer floral purchase frequency. In: *HortTechnology* 15 (4): 766-771.
- (2007): Behavioral differences in prepurchase processes between purchasers of flowers for self-use and for gift use. In: *HortTechnology* 17 (2): 183-190.
- HUANG, L.C. and T.F. YEH (2009): Floral consumption values for consumer groups with different purchase choices for flowers. In: *HortTechnology* 19 (3): 563-571.
- HUDSON, D. and E. GRIFFIN (2004): Market potential for ‘Mississippi Grown’ cut flowers. Bulletin No. 1140. Mississippi Agricultural & Forestry Experiment Station, Mississippi State University, Starkville.
- KAIM, E., K. FLUCK and M. ALTMANN (2012): Typology of German consumers on the market for ornamental plants. In: Book of abstracts of the 2<sup>nd</sup> Symposium of Horticulture in Europe, 1<sup>st</sup>-5<sup>th</sup> July, Angers, France.
- KELLEY, K.M., B.K. BEHE, J.A. BIERNBAUM and K.L. POFF (2001): Consumer preference for edible-flower color, container size and price. In: *HortScience* 36 (4): 801-804.
- KITTEMAN, F. (2007): Kundenzufriedenheitsmessung verschiedener Einkaufsstätten für Topfpflanzen, Baumschulartikel und Stauden. Diploma thesis. FH Weihenstephan, Freising.
- LERCH, C. (2009): Branchenfokus: Lebendiges Grün – Jahrgang 2009. BBE- Retail Experts, Köln.
- MENRAD, K. and C. FINK (2005): Einzelhandel – Kunden im Baumarkt und im Fachhandel. In: *Deutscher Gartenbau* 59 (1): 34-35.
- MENRAD, K. and P. HARDUNG (2006): Wer kauft wie ein? In: *Deutscher Gartenbau* 60 (24): 40-41.
- MENRAD, K. and A. GABRIEL (2010): Segmentation of customers of horticultural products in Germany. In: *Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaus e.V.* 45 (2010): Agrarmärkte nach dem Boom: 491-493.
- NIEHUES, R. and S. UHL (2006): Absatzwege für Blumen, Zierpflanzen und Gehölze. In: *ZMP: Materialien zur Marktberichterstattung* 64. Zentrale Markt- und Preisberichtsstelle, Bonn.
- OPPENHEIM, P.P. (2000): Segmentation and target marketing in a floral market. In: *Acta Horticulturae* 536: 529-536.
- POSADAS, B.C., C.H. COKER, G. FAIN and P.R. KNIGHT (2006): Consumer survey of selected garden chrysanthemum cultivars in Mississippi. In: *HortTechnology* 16 (3): 539-543.
- SCHMAHL, S. (2008): Warum kaufen Männer so ungern im Gartencenter? In: *Grüner Markt* 2008 (4): 14-15.
- SCHÜTTE, C. (1990): Die Aussagerelevanz von Marktsegmentierungen mittels multivariater Analysemethoden. Schriftenreihe zur Wirtschaftslehre des Haushalts. Justus-Liebig-Universität, Gießen.
- WEDEL, M. and W.A. KAMAKURA (2000): Market segmentation: Conceptual and methodological foundations. Kluwer Academic Publications, Boston.
- YEH, T.F. and L.C. HUANG (2009): An analysis of floral consumption values and their difference for genders and geographic regions. In: *HortTechnology* 19 (1): 101-107.
- YUE, C. and B.K. BEHE (2008): Estimating U.S. consumers’ choice for floral retail outlets. In: *HortScience* 43: 764-769.
- ZMP (Zentrale Markt- und Preisberichtsstelle) (2008): Marktübersicht Zierpflanzenbau 2008 (2). Bonn.

## Acknowledgement and Remarks

The authors want to thank Florian Kitemann for collecting the data for this article during his diploma thesis at the University of Applied Sciences Weihenstephan. In addition, we thank two anonymous reviewers for their valuable contributions and remarks.

A previous version of this research was published on a poster presentation entitled “Verbrauchersegmentierung bei Gartenbauprodukten in Deutschland” at the 49<sup>th</sup> Conference of the Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaus e.V. dated September 30<sup>st</sup> – October 2<sup>nd</sup>, 2009 in Kiel. The corresponding paper in the conference book is cited as MENRAD and GABRIEL (2010).

Contact author:

**ANDREAS GABRIEL**

University of Applied Sciences of Weihenstephan-Triesdorf  
Faculty of Horticulture and Food Technologies  
Am Staudengarten 10, 85354 Freising-Weihenstephan  
e-mail: a.gabriel@wz-straubing.de