

## **THE IMPORTANCE OF A PRODUCT BRAND FOR AGRICULTURAL PRODUCERS WHEN PURCHASING MINERAL FERTILIZERS**

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**Abstract.** The market of mineral fertilizers is one of the most important markets of agricultural production means of industrial origin. The specific character and importance of mineral fertilizers in agriculture makes it worth to pay special attention to the issues related to their purchase by agricultural producers. This paper presents results of empirical research concerning the importance and impact of a fertilizer brand on purchase decisions made by farmers. The results of the research concerning the extent of recognition of compound fertilizer brands among farmers were also shown. The results of the research demonstrated that a fertilizer brand, as a factor shaping farmers' behaviours in the examined market, depends on the age of agricultural producers and the area of agricultural holdings. As it appears from the correspondence analysis performed, a very large influence of a fertilizer brand on purchase decisions was characteristic of the agricultural producers running agricultural holdings with an area of 30–49.99 ha and 100 ha or more.

**Key words:** mineral fertilizers, brand, correspondence analysis

### **INTRODUCTION**

In recent years, considerable changes in the product structure of mineral fertilizers took place in Poland. Currently, the sale offer for those products in the domestic market is very broad. The companies operating in the market of mineral fertilizers changed their position from passive distribution of fertilizers to very active searching for customers and increasing the sales volume. Production and trade companies on the examined market use different strategies, methods and techniques addressed to the buyers in order to encourage them to purchase particular kinds of fertilizers.

The market of mineral fertilizers in Poland is oligopolistic and non-price forms of competition (diversification, branding, advertising, etc.) are predominant there. An es-

sential way of capturing the market of fertilizers is to develop a correct marketing strategy for a company. Currently, one of the most important marketing tools for competing in the market of mineral fertilizers in Poland is the brand [Piwowar 2011]. The largest domestic manufacturing companies in the fertilizer sector worked out characteristic names (brands) of products. For example, the names of *Polifoska* or *Lubofoska* fertilizers indicate explicitly their manufacturers. Behind a brand name there lies the manner of managing an organization, specific organizational culture and key values, which determine the standards for managing a given production company. It often happens that, apart from a name or a colour scheme, also a symbol that indicates that the product is associated with a specific company appears on fertilizer packaging. If a company has a strong brand recognizable by customers, such a situation improves the position of the company in relation to agents and competitors [Dębski 2009].

The complexity of the entire decision-making process undertaken by farmers increases along with the development of the market of mineral fertilizers. Demand for knowledge concerning the behaviours of agricultural producers in the examined market increases too. According to the latest behaviour theory, both economic and non-economic factors shape the behaviour of consumers. In this regard, also the important role of knowledge, experience and market information is indicated [Kieźel 2004]. The consumer behaviour in the market is shaped mainly by economic, socio-cultural and psychological factors. Some researchers also distinguish marketing determinants [Woś, Rachocka, Kasperek-Hoppe 2011]. The problems of market behaviours of farmers discussed in this study are in the centre of interest of many scientific disciplines, inter alia, sociology, psychology, economics and agriculture. Behaviours of agricultural producers are shaped to a high extent under the influence of the natural and social environment. The character of a region, in which agricultural producers have their agricultural holdings, may be very important in the shaping of their behaviours. The behaviours in the market of mineral fertilizers depend not only on psychological and social factors, but also on the knowledge of farmers and their rational, economically-grounded choices.

The main aim of this study is to present the importance of a mineral fertilizer brand in purchase decisions made by agricultural producers. The subject matter of the research described in this paper was also the recognition of compound mineral fertilizer brands among farmers, while the results of the research were to help answering the following research questions: *Is a fertilizer brand an important factor in purchase decisions in the market of mineral fertilizers? Which brands available in the domestic market are characterized by the highest recognition among farmers?*

## METHODOLOGY AND SOURCES OF MATERIALS

The basis for this paper was a questionnaire surveys carried out among the farmers that use agricultural lands in three selected districts of Lower Silesian Province. It has been assumed for the surveys that agricultural holdings with an area exceeding 5 ha will be eligible to be in the test sample. The test sample included 319 agricultural holdings. Farmers from eighteen communes of Lower Silesian Province took part in the questionnaire surveys. From the analysis of the gathered material it appears that the total area of

arable lands in the surveyed agricultural holdings was 10,993.93 ha, which constituted 5% of the arable lands in the three examined districts. The difference in the respondents' age (the age range of 18–71 years) was quite high – 53 years, while the average age was 45 years. Among the respondents, there prevailed men (89%). The analysis of data revealed that the surveyed agricultural producers were characterized mainly by considerable experience in agricultural production. On average, the respondents have worked in an agricultural holding for 23 years. From the analyses performed it appears that over 87% of the surveyed agricultural producers had secondary education or basic vocational education, while 9% had higher education. The smallest group constituted agricultural producers with primary education (4%). More than 64% of the respondents declared education with an agricultural profile.

The measuring tool for the original surveys was an author's survey questionnaire. The scope of the survey included, inter alia, the problems discussed in this study that relate to the factors determining the decisions concerning the choice of fertilizers, as well as a detailed identification of the needs and expectations of the farmers in the scope of mineral fertilizers. The questionnaire surveys carried out in 2009 were a part of the research work leading to a deeper understanding of problems related to the competition and competitiveness in the market of mineral fertilizers in Poland [Piwowar 2011].

Eight factors were selected for analysing the behaviours of farmers: price of fertilizer, brand of fertilizer, quality of fertilizer, technical equipment of agricultural holding, crop cultivation technology, nutritional requirements of crops, the country of production of fertilizer, and habit (tradition). In the opinion of the author, the selected factors may significantly determine the behaviours of agricultural producers in the examined market of agricultural production means. The choice of factors was intentional, and the basis for the selection was provided by the conclusions from the research conducted earlier in the market of mineral fertilizers in Poland [Piwowar 2007, Spiak, Piwowar 2007], as well as by author's experience acquired during work in the fertilizer industry. The factors chosen for the research were mainly of economic character, however the author is aware that other groups of factors, including psychological and socio-cultural factors, are also important.

The correspondence analysis method, classified in the group of exploratory methods, was used for processing the results of the empirical research. The methodology of the analysis is based on the  $\chi^2$  test of independence. For the needs of this study, so-called mean square contingency (mean square contingency coefficient –  $\phi^2$ ) was used for measuring the strength of the dependencies between the examined features. Analyses based on Burt Table were performed within the study in order to investigate the co-occurrence of categories of many variables [Stanimir 2005]. The correspondence analysis referred to in this paper was carried out with the use of the 'STATISTICA 9' software.

When analysing the questionnaire survey data, there were used two indicators for measuring the extent of brand recall among consumers: spontaneous brand awareness and aided brand awareness [Koziełski, Pogorzelski, Dziekoński 2011]. The list, which provides a basis for investigating the aided awareness of compound fertilizer brands, contained 6 brand names of compound fertilizers popular in Poland (*Polifoska*, *Lubofoska*, *Amofoska*, *Polimag*, *Poliwap*, *Polidap*). The compound fertilizers included in the list are the basic product range offered in the market of mineral fertilizers in Poland.

## THE IMPORTANCE OF THE BRAND IN COMPARISON WITH OTHER FACTORS DETERMINING THE BEHAVIOUR OF AGRICULTURAL PRODUCERS IN THE MARKET OF MINERAL FERTILIZERS

The questionnaire surveys allowed obtaining the information about factors that shape the behaviours of farmers in the market of mineral fertilizers. The results of the surveys allowed assessing the influence of the selected factors on agricultural producers' decisions regarding purchase of mineral fertilizers (Figure 1).

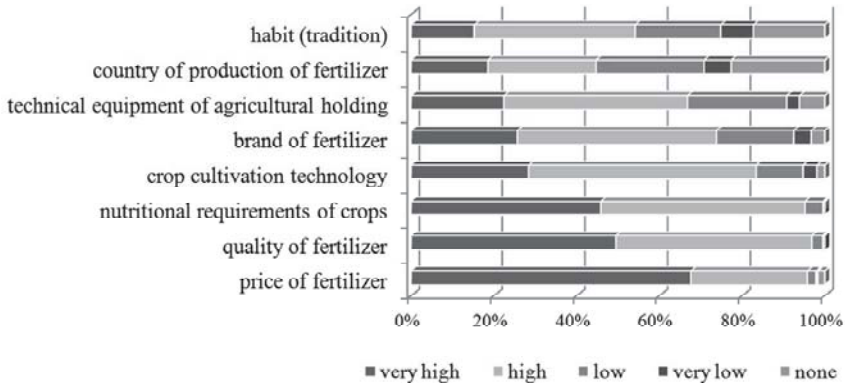


Fig. 1. The importance of the selected factors in decisions concerning purchase of mineral fertilizers – according to farmers

Rys. 1. Ważność wybranych czynników przy wyborze nawozów mineralnych w opinii rolników

Source: own study based on the surveys carried out among farmers

Źródło: opracowanie własne na podstawie przeprowadzonych badań producentów rolnych

The results of the surveys shown that most respondents evaluated the selected factors as very important or important. From the analysis of the material collected in the questionnaires it appears that the most important factor that, according to agricultural producers, contributes to making a decision on the purchase of particular mineral fertilizer, is the price of fertilizer. Subsequently, the agricultural producers mentioned quality of fertilizer, nutritional requirements of crops, crop cultivation technology used in the agricultural holding, the brand of fertilizer, technical equipment of the agricultural holding, and the country of production of the fertilizer. According to the respondents, the least important factor is a habit (tradition). In particular the latter fact is interesting, because there is a general opinion that agricultural producers have a conservative approach to the issues related to the purchase of agricultural production means.

From the viewpoint of the deliberations presented in this study, it is worth emphasizing that 73.8% of the respondents mentioned the fertilizer brand as a very important or important factor affecting the decisions concerning the purchase of mineral fertilizers, which stresses the importance of this factor in the decision-making process. In order to determine the relationships between the importance of a brand when purchasing mineral fertilizers and the demographic and social features of farmers, a correspondence analysis was performed. Values of the  $\chi^2$  statistic, the critical value of  $\chi^2$  and mean square contingency  $\phi^2$  for the analysed variables are given in Table 1.

Table 1. Statistics values  $\chi^2$ , critical values  $\chi^2_{\alpha=0.01}$  (in parentheses), and mean square contingency  $\phi^2$  for the following features: brand of fertilizer, age, education, arable land area, district  
 Tabela 1. Wartości statystyki  $\chi^2$ , wartości krytyczne  $\chi^2_{\alpha=0.01}$  (w nawiasach), średniokwadratowa wielozależność  $\phi^2$  dla cech marka nawozu, wiek, wykształcenie, obszar użytków rolnych, powiat

$\phi^2$ \ $\chi^2$	Age	Education	Arable land area	District
		18.972 (26.217)	74.727 (42.980)	4.398 (20.090)
Brand of fertilizer	61.398 (42.980) 0.192	0.059	0.234	0.014

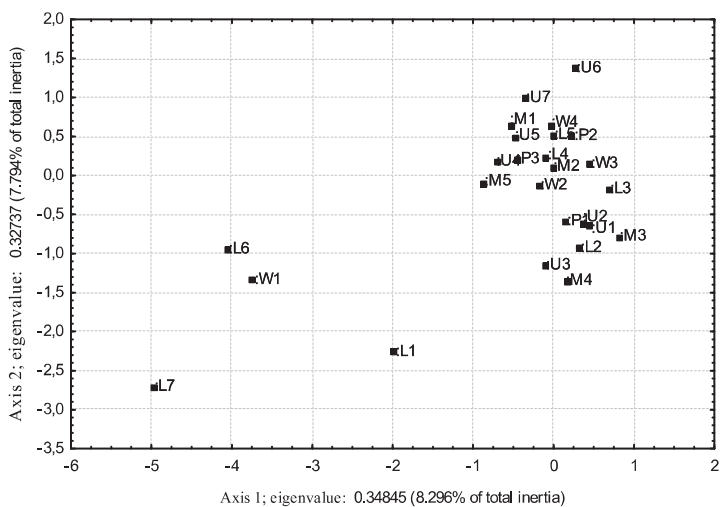
Source: own study

Źródło: opracowanie własne

The result of the  $\chi^2$  test of independence showed that the hypothesis on the independence of features should be rejected for two pairs of features: fertilizer brand – farmer's age, and fertilizer brand – arable land area. Thus, it can be concluded that the brand of fertilizer, as a factor shaping farmers' behaviours in the market of fertilizers, depends on the age of agricultural producers and the arable land area of their agricultural holdings. When comparing the values of mean square contingency  $\phi^2$ , it can be noticed that the strength of the dependencies between the features was the highest for the following pair of features: mineral fertilizer brand – arable land area.

For optimal representation of the co-occurrence of the investigated variables, bivariate projection space was adopted. Graphic presentation of the results of the analysis of the correspondence is presented in Figure 2.

From the graphic presentation of simultaneous occurrences of the categories of the investigated variables it appears that there is co-occurrence of some categories of features. Particularly interesting are the dependencies occurring between the examined factor and the demographic and social features of farmers. When interpreting the results of the correspondence analysis, it can be concluded that there are relationships between the statements on the importance of brand when making decisions regarding purchase of fertilizers and the size of an agricultural holding. The correspondence between the statements on low (M3) and very low (M4) importance of the brand in the selection of fertilizer and relatively smaller agricultural holdings, (U1, U2) and (U3) respectively, was particularly characteristic. The second regularity indicates the occurrence of co-existence of the category of very high importance of the brand (M1) when purchasing fertilizers and the agricultural holdings with an area of 30 to 49,99 ha (U5) as well as large agricultural holdings with an area of 100 ha and more (U7).



Variable	Brand of fertilizer					Age							Education				Arable land area					District				
	very large	large	small	very small	none	<19	20-29	30-39	40-49	50-59	60-69	>70	primary education	vocational educ.	secondary educ.	higher education	5-9.99	10-14.99	15-19.99	20-29.99	30-49.99	50-99.99	100 and more	Wrocławski district	Sirzelński district	Kłodzki district
Symbol	M1	M2	M3	M4	M5	L1	L2	L3	L4	L5	L6	L7	W1	W2	W3	W4	U1	U2	U3	U4	U5	U6	U7	P1	P2	P3

Fig. 2. Graphic presentation of the results of the analysis of the correspondence between the importance of the brand when purchasing mineral fertilizers and the investigated features of farmers

Rys. 2. Graficzna prezentacja wyników analizy korespondencji znaczenia marki przy zakupie nawozów mineralnych przez producentów rolnych z badanymi cechami rolników

Source: own study

Źródło: opracowanie własne

## AWARENESS AND PERCEPTION OF MINERAL FERTILIZER BRANDS AMONG AGRICULTURAL PRODUCERS

The questionnaire used as a measuring tool in the survey allowed measuring the indicators of awareness of fertilizer brands among the surveyed farmers. The survey questionnaire included questions that aimed at determining two indicators of brand awareness:

- spontaneous brand awareness (respondents gave a brand without any help),
- aided brand awareness (respondents indicated a brand from the prepared list).

As it appears from the research, *Polifoska* is a brand with the highest recognizability. The indicator of spontaneous awareness of this brand at the level of 25–38% (depending on the study area) gives it the position of the leader in the market of mineral fertilizers. The following brands were much less recognizable: *Lubofoska*, *Lubofos*, *Amofoska*, *Agrofoska* and *Polimag*.



Also the research on the aided awareness of compound fertilizer brands showed that Polifoska was the most frequently mentioned brand of fertilizers. The indications of the respondents in the scope of the aided awareness of the most popular brands of compound fertilizers were higher than in the case of the spontaneous awareness. This concerned mainly two brands of fertilizers: *Lubofoska* and *Amofoska*.

Marketing strategies of companies operating in the mineral fertilizer market are based more and more often on building a high level of brand awareness and a positive brand image. This results from the fact that from the viewpoint of a company the key issue is to create a desired image of the company and its products [Ślusarczyk 2009]. For producers of mineral fertilizers the brand image, i.e. a set of brand attributes, is especially important. The set of such attributes creates in consumer awareness a certain abstract concept characterizing and differentiating a brand. In order to examine the image of the selected brands of mineral fertilizers, a verbal association test was used in the research. The use of a verbal association test for examining the opinions on a product is important, because it may be very helpful in the research of motives for purchase [Mazurek-Lopacińska 2002]. For example, the set of associations of agricultural producers related to the *Polifoska* brand concerned mainly the following words: good, quality, little care, Poland. This indicates that the image of the *Polifoska* brand is positively shaped among farmers, which may be conducive to making decisions on purchasing fertilizers of this brand.

It should be emphasized that from the viewpoint of a company the fact of having a positively perceived brand allows strengthening its position in the market and gaining a competitive edge. As it was stressed by Patkowski, the brand is an element of company's competitive advantage [Patkowski 2010]. Good recognizability of a brand and its favourable image increase the probability of selecting this brand from a set of brands considered for purchase. The escalating competitive struggle in the market of mineral fertilizers and the increasingly broader range of the offered products are conducive to the growing importance of a brand in the examined market of agricultural production means.

## **SUMMARY**

The results of the research showed that the most important factors that contributed to farmers' decisions on purchasing specific mineral fertilizer are as follows: fertilizer price, fertilizer quality, and nutritional requirements of crops. Subsequently, the agricultural producers mentioned the crop cultivation technology used in the agricultural holding, the brand of fertilizer, technical equipment of the agricultural holding, and the country of production of the fertilizer. However it should be emphasized that almost every third agricultural producer indicated the fertilizer brand as a very important factor in making decisions on the purchase of mineral fertilizers. The influence of this factor was comparable with the influence of the equipment of the agricultural holding and the production technology used.

The correspondence analysis showed that the selection of the fertilizer brand as a factor in the purchase decisions regarding mineral fertilizers depended on the age of agricultural producers and the arable land area in their agricultural holdings. A characteristic feature was the co-occurrence of the statements about little and very little importance of a brand when purchasing fertilizers with the relatively smaller agricultural holdings, as

well as the correspondence of very great importance of a brand when purchasing fertilizers with the agricultural holdings larger in terms of the area. The questionnaire surveys showed that the respondents knew the brands of mineral fertilizers available in the domestic market. As it appears from the research, the *Polifoska* brand is characterised by a particularly high level of awareness (both spontaneous and aided one) among farmers.

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## ZNACZENIE MARKI PRODUKTU PRZY ZAKUPIE NAWOZÓW MINERALNYCH PRZEZ PRODUCENTÓW ROLNYCH

**Streszczenie.** Rynek nawozów mineralnych jest jednym z najważniejszych rynków środków produkcji rolnej pochodzenia przemysłowego. Specyfika i znaczenie nawozów mineralnych w rolnictwie sprawiają, że warto zwrócić szczególną uwagę na zagadnienia związane z ich zakupem przez producentów rolnych. W artykule przedstawiono wyniki badań empirycznych dotyczących znaczenia i wpływu marki nawozów na decyzje zakupowe podejmowane przez rolników. Zaprezentowano również wyniki badań dotyczących stopnia znajomości marek nawozów wieloskładnikowych przez producentów rolnych. Wyniki badań wykazały, że marka nawozu jako czynnik kształtujący zachowania rolników na badanym rynku zależy od wieku producentów rolnych i obszaru gospodarstw rolnych. Jak wynika z przeprowadzonej analizy korespondencji, bardzo duży wpływ marki nawozu na decyzje zakupowe cechował producentów rolnych prowadzących gospodarstwa rolne o powierzchni 30–49,99 ha oraz 100 ha i więcej.

**Słowa kluczowe:** nawozy mineralne, marka, analiza korespondencji