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Online Survey of Keepers of Rare Animals or Plants about their Activities and Attitudes in Germany

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Summary

The goal of the study „Online Survey of Keepers of Rare Animals or Plants about their Activities and Attitudes” is to for the first time characterise this group of persons for Germany and German-language speaking countries. An online survey was carried out with the help of the appropriate associations targeted to these special interest groups. Detailed information on the attitudes and form of involvement could be gained, as well as on the type and extent of the direct keeping of rare plants or animals. Very different types and species or varieties, are kept. Marketing aspects are important and “Maintenance through Eating” was unanimously recommended. Only a scant half of those surveyed consider their own abilities as adequate for conservation. Support is desired both in terms of maintenance activities and in marketing questions. The results offer a starting point to show where persons contributing to the maintenance of rare plants or animals can be supported.

JEL: H 44, Q 13, Q 57

Key words: Genetic resources, on-farm management, online survey

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1 The Problem

The introduction of scientific plant breeding in agricultural practice in the 19th Century led to varieties that attracted great interest. Their distribution led to a speedy drop in the varieties used until then, which served as the basis for the newly bred varieties. This soon became evident to the breeders, and they began to collect landraces as breeding material and the basis for further breeding advances (HAMMER, 1999).

In animal husbandry, this process of displacement and successive unifications also took place, but later (WERKMEISTER, 1996). In the mid 20th century a critical discussion on the adequate availability to permit breeding development began at the international level (FRANKEL et al., 1970). With advancing discussion, the loss of plant cultivars and farm animal breeds was seen as more than just a loss for the further breeding efforts. Increasingly the process could be seen as threat causing a monopolisation of gene-material on the one hand, and a loss of agricultural diversity and of the diversity of food, and thus the related cultural diversity, on the other hand (MOONEY, 1983). Thus the goals of the conservation changed in the sense that not only the breeding material was collected for breeding purposes or saved in animals. Here, another goal, the conservation goal of protecting diversity was added (see i.e., SPRENGER, et al, 2003), meaning active efforts on the part of agriculture to protect agricultural biodiversity (BMELV, 2007).¹ Under the concept of agricultural biodiversity are included all plants and animals, or rather, all forms of life that are important for nutrition, agriculture, forestry and fisheries. With the term “genetic resources,” the life forms that could be used are additionally included. Here both potentially useful plants and animals are meant, as well as the currently unused or less used cultivated plants and livestock. The latter are described in the literature with different attributes such as “farmer’s or traditional varieties or landraces,” “rare cultivated plants” or “endangered cultivated plants and animals.” In the context of the topic conservation, different descriptions often serve to make clear that forms of life are being considered here that, due to their reducing dis-

¹ See BMELV: „ Primarily, agricultural biodiversity is understood to be the diversity in life forms used or able to be used directly or indirectly by humankind in efforts to secure the resources vital to survival: crops (including their wild relatives), forest plants, livestock, wildlife that can be hunted or otherwise made use of, fish and other aquatic life forms, microorganisms used in food technology and other processes, and other small life forms.” in: http://www.bmelv.de/cln_045/nn_757144/SharedDocs/downloads/__EN/10-BiologicalDiversity/BiologicalDiversity,templateId=raw,property=publicationFile.pdf/BiologicalDiversity.pdf

tribution and low population size, are threatened in their reproduction as a single type, variety or species. Various definitions exist to determine and categorize the threat and rarity of the type, variety or species. An internationally recognized scheme for wild species was drafted by the International Union for the Conservation of Nature and Natural resources (IUCN) (IUCN et al, 2001). The effective population size serves as a decisive criteria to establish the level of endangerment in the area of the conservation of farm animal species (DGfZ; 2003); SCHERTLER, 2004). In contrast to the protection of wild species, and in the area of farm animals, scientifically conceived definitions, the term “rare/endangered” cultivated plants and animals, may only have been vaguely acknowledged by those who say they conserve animals and plants. Here a personal subjective perspective of rarity or endangerment could certainly be the case.

Just as with the explanation for the conservation of cultivated plants and animals, there is by no means consensus on the type and level of the conservation. The collection of samples in so called gene banks is an inexpensive strategy (WBGU, 2000, P. 944) implemented in both Germany and internationally. But this form of conservation can only be realized to a certain extent in the realm of animals. Also the protected samples are decoupled from evolutionary processes (IBISCH et al., 1996, P. 188; WBGU, 2000, P. 92). It is further argued that a collection of samples is only a partial solution to the problem of a loss of diversity, since it is neither possible nor desirable to conserve total biological diversity *ex situ*.

As much biological diversity as possible should be part of our cultural life. The diversity perceived as inadequate in agricultural-horticultural production, as well as in the food supply, should be improved. Here it is necessary to maintain and to plant and breed a huge variety of cultivated plants and animals for everyday life (WBGU, 2000, P. 94), this is called “On Farm Management” of genetic resources (HAMMER, 1999, P. 39). With this method, the genetic material is constantly exposed to current environmental conditions and breeding selection. In addition, On Farm Management links agricultural and socio-cultural aspects since both local knowledge about cultivated plants or animals and all possible forms of use are obtained (see, i.e., VIRCHOW, 1999, 38 f.). An important component of On Farm Management is, in addition to the immediate maintenance of rare plants and animals, their use through crops and husbandry. In agriculture and horticulture “use” means production for consumption. Thus, maintenance or even extension of the used agricultural plants and animals on species- or race- or variety-level has an effect on the consumer and the nutritional status because it widens the diversity of food;

without doubt a positive effect for nutrition and consumer demand. In summary, the reintroduction of rare cultivated plants and animals for use and marketing can be seen as a sustainable conservation form. How can this be placed on a solid base? Is it enough, for example, to rely on voluntary activity in the hope that a constantly adequate number of persons will be active in the area? Is it at all possible that On Farm Management can be carried out on a voluntary basis in all cases? Particularly the keeping of large animals (cattle, horses, pigs) is tied to considerable financial and time inputs. Specifically in these cases, but also as a basic question, a search for stable and above all sustainable strategies is needed (DGfZ, 2003; EFKEN, 2005; FELDMANN, 2002).

In Germany, no even near to satisfactory overview of existing private activities to conserve genetic resources (who maintains what, how many and how) is available. Until now knowledge was limited to case studies (BECKER et al., 2003) and publicly perceived activities as well as the few publicly known actors, companies and organizations. The extent of the actual activity and its form (associations, public relations, education or the direct keeping of plants and animals) were hardly known. This stands in contrast to the higher information level with regard to the activities in public agencies such as the Gatersleben Gene Bank, the Julius Kühn Institute German Research Institute for Cultivated Plants (JKI), botanical gardens; information can be found, for example, in the BIG, XGRDEU, ZEFOD databases [www.genres.de].

Associations, clubs and other groups regret this lack of an information basis since it hinders a coordinated conservation approach. Interest representation can be only inadequately implemented.² But the actual work in maintenance breeding is also affected negatively by the lack of information. A study prepared on behalf of the BMVEL (now BMELV) on communication strategies for agricultural biodiversity provides comparable and supplementary information (KLEINHÜCKELKOTTEN et al., 2006. P. 154):

“The communication field analysis resulted in a number of governmental and non-governmental institutions that communicate in various ways on the topic “Agro-biodiversity.” The effect of communication is however limited for the following reasons:

² Conversations with representatives of the VIEH e. V., VEN, VERN, GEH organizations (information on the organizations can be found at the end of the report).

- *..... The actor landscape is shattered, cooperation between the different breeding and maintenance association is rare, a link between the conservation of plants and animals is missing.*
- *Due to the strained financial and personnel situation of conservation initiatives and organizations, but also in part because communication is not perceived as a task in itself, this only takes place in very limited measures.....”*
- *As well as the comment “Experience in the framework of this study compared to Austria, Switzerland and Great Britain show that a central communicator of the topic, ..., can reach a significantly higher level of effectiveness in communication.....”*

On the political level it has been recognized that activity to maintain diversity must be strengthened (BMELV, 2007). How, however, can support be provided when only inadequate knowledge exists about the people currently involved in this field. Ultimately, due to inadequate information, the basis for descriptions and analysis of this group of persons is missing. Here it is not important that this group comprises only a small part of society and economy. Deficits, barriers, strengths and weaknesses as well as strategies can first be discussed when the level and form of conservation work becomes clear. Only in this way can a sensible and success-oriented support structure be established.

This gap shall be closed with the help of a questionnaire including information on both direct conservation activities as well as information on motivation, obstacles, chances and opinions. The survey also served to test the acceptance of the principle of “maintenance through Eating” and to what extent it is seen as an option for sustainable improvement of the conservation of genetic resources.

2 Data Base and Survey Method

In order to estimate who and how many people are active in the area of conservation of rare cultivated plants and animals, it must first be established how widely the topic has been addressed in the general population. About one quarter of those surveyed in a GfK³ representative survey in Germany were familiar with the term “Biodiversity/biological diversity” (BIOFRANKFURT KOMPETENZZENTRUM BIODIVERSITÄT FRANKFURT, 2007). The knowledge was above average in persons with a higher education level, which was also confirmed in the study on communication strategies for agricultural biodiversity (KLEINHÜCKELKOTTEN et al., 2006, P. 67). However, in the latter study the difficulties tied to this topic were presented in detail. Biological diversity and synonyms are complicated in and of themselves. But at the same time, it appears to the authors that the topic is itself difficult to communicate, which means that only a few people, mainly with professional vicinity to the topic, possess adequate knowledge. “Massive problems do not only occur in the semantic comprehension of the meaning of the term, but rather also in relation to the perception and acceptance as a socially relevant topic, as a national and supra-national problem, affecting not only policy and agricultural economics, but also private consumption.” (KLEINHÜCKELKOTTEN et al., 2006, P. 68). In this context it should be noted that this work is focused on the situation in Germany, an industrialised country. Agricultural practice concentrates on a few species and uses only modern commercial seeds and breeds in concert with an enormous range of food products in the supermarkets. While agricultural production becomes less and less diverse, diversity in the supermarkets is fuelled to a large degree by imports from all over the world and additionally by processing of few agricultural raw materials into as many different products as possible. Thus in sum it is a deceptive diversity because the problem of loss of diversity is barely apparent in daily life in industrialised countries and doesn't stress producers or consumers directly, as it does perhaps in subsistence agriculture. Nevertheless, the loss of diversity is just as existent in industrialized countries as anywhere else on Earth. As a result what we have lost, are going to lose and what to do about it isn't immediately apparent. Additionally the topic engenders no direct pressure and consequently neither broad attention nor engagement.

³ GfK: "Gesellschaft für Konsumforschung" The GfK Group is an international market research company, headquarter is Nuremberg, Germany, <http://www.gfk.com/group/index.en.html>.

Against this background it can be assumed that only a very small group of people can describe and evaluate the facts and problems. Part of this “very small” population group are then those persons who not only possess knowledge, but who use it for active or passive conservation purposes. Information on these circles is hardly available. Estimates by various professionals confirm that overall only few persons are involved in this field. They assume that persons interested in conservation are only partially organized in according associations and initiatives. Thus the persons can only in part be reached over these organizations in the framework of a survey. Nonetheless, cooperation with organizations involved with the topic of conserving rare cultivated plants and animals appeared to be the only way to make contact to persons interested in this topic. Accordingly a target-group oriented survey is perceived as professional and efficient. It is, however, clear, that the results on the interest group cannot be tested for representativity. In any case hypotheses can be formulated on the basis of the results on how far the group of respondents represents a defined whole. Ultimately, this study has an explorative character, it is to deliver first information with regard to type and extent of involvement as well as the perspective of those active in this field.

Known organizations and actors in this area were contacted and asked for support in the implementation (Table 1). Meetings were held with representatives of VIEH e. V.; GEH; VEN; VERN, Dreschflegel, SAVE and the North Rhine Westphalia Chamber of Agriculture.⁴ Here the assumption made about a lack of information in this branch was to be tested and the level of support of the project on the part of the organizations was to be evaluated. The very inadequate information level was confirmed across the board. At the same time, all contacted persons supported the project enthusiastically since the information deficit and non-transparency are perceived as a problem, but own efforts were not seen.

⁴ Exact information on the associations or initiative mentioned here can be found under „Organizations“ at the end of this report.

Table 1: Members or Addressees of Organizations (May 2007)

Organization	Number of Addresses	Newsletter Mailings	Internet Presence
VIEH e.V.	approx. 3100	Yes	Yes
SAVE-Foundation	approx. 650 German Ad- dresses	Yes	Yes
GEH	approx. 250	Yes	Yes
VEN	approx. 250	Yes	Yes
VERN	approx. 300 – 350	Yes	Yes
Lk-Nordrhein- Westfalen	approx. 30	Yes	
IBV			Yes

In further conversations with organization representatives, a draft of a survey was presented and goals of the survey defined. In discussion, critique and recommendations were made to ensure that the questionnaire considered relevant topics. The questionnaire was ultimately discussed with staff of the GESIS⁵ in Mannheim with regard to content and questioning techniques. Finally pre-tests were carried out on ten subjects.

The survey was conceived as an online survey. With an online survey only minimal costs occur for the transfer of the questionnaire to the interview partners or in the collection and computer documentation of the data. A disadvantage of this method is that it excludes all those with no access to Internet. Although this is only a declining number of persons, systematic distortions do occur. Particularly older persons use the Internet less, while persons with degrees in higher education make above average use of the Internet (AGOF, 2008). The advantages of an on-line survey are the direct answering of the questionnaire. The

⁵ GESIS – Leibniz Institute for the Social Sciences (“Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen e.V.” (GESIS), scientific section: Center for Survey Design and Methodology in Mannheim. The department consults social research in the drafting, implementation and evaluation of social science studies, <http://www.gesis.org/en/institute/>

direct answering on the computer tends to be more user-friendly. A stronger form of dialogue can be created with the help of a computer-based questionnaire (DANNENBERG et al., 2002, P. 209). In addition, filter questions, meaning questions with an impact on the further course of the survey can be used: depending on how the filter questions are answered, further in-depth questions can follow, or these specific questions can be jumped over. The “umfragecenter” product by the Globalpark Company GmbH was used to carry out this survey. For research purposes, the less expensive version “unipark” can also be used under certain circumstances. There is a platform solution. The content, form, and technical preparation of the questionnaire, as well as the direct implementation of the survey via Internet is controlled by the user via a normal browser from the own PC. Data transfer and management take place on company owned computers and facilities. A handbook provides support as does membership in a mailing list. After the questioning phase, the data can be loaded in different formats onto the own PC. Additionally, diverse statistics on the course of the questioning and the response behaviour can be used.

In addition to a call to participate in the survey in the diverse newsletters of the cooperating organizations, a link to the survey was placed on the homepage of each organization. In Table 1 it can be seen that a total of about 4580 persons were informed of the survey via newsletters, whereby a certain number were contacted two or three times since persons are included in the distribution lists of various organizations.

The questionnaire was made available from the beginning of May to the end of August 2007. In this time, 1261 persons clicked on the questionnaire, and 500 filled it out completely. Participants who stopped almost always stopped on the first pages, which indicates that they had no further interest on the survey. Only a scant ten percent discontinued completion of the survey on a later page. With the help of a quality index delivered with the survey software which scaled the average completion time for each individual page and a view of a survey with very short answering times, 15 surveys were filtered out with almost no questions answered. A total of 485 questionnaires flowed into the analysis. At the end, the online survey achieved a response level of a scant 40 %. In the review, 50 percent of all completely answered surveys were received after 14 days, and after a month half of the 1261 persons had called up the questionnaire. Apparently the intensive public relations efforts at the start (particularly the newsletters sent in May 2007) worked.

3 Presentation and Analysis of the Results

Before the results and analyses of the survey are presented, it is necessary to explain the terms used in the following for orientation purposes.

In the questionnaire, questions addressed not only the housing of farm animals or the cropping of cultivated plants, but the maintenance of rare animals and additionally rare breeds or also the cropping of rare cultivated plants and additionally rare varieties as well. The question about rare breeds and varieties is necessary in order to garner a precise image of the maintenance of cultivated plants and of animals. Thus it is necessary to study the tables and graphics to see which category is described in the following. The question about the keeping of animals and cultivation of plants as well as rare animals and plants led to the development of groups with the following appellations:

- Animal Keeper Persons who keep animals
- Plant Cultivator Persons who cultivate plants
- Direct Keeper/Cultivator Persons who keep rare animals or cultivate rare plants
- Indirect Keeper Persons who are interested in the topic of rare animals or plants but do not keep any themselves

Furthermore, in the following text, the term “Species group” is used. This is a term taken from taxonomy and shall describe groups of non-related species which are joined in the survey such as “Herbs and Spices.” Last but not least, in the interpretation of the results it shall be considered that those questioned did not in every case use an exact or same definition of species, variety or breed. Detailed definitions were deliberately avoided in questionnaires. On the one hand this prevented an overloading of the questionnaire and thus a higher breaking off level. On the other hand, it does not necessarily hold true that definitions are immediately understandable during the interview.

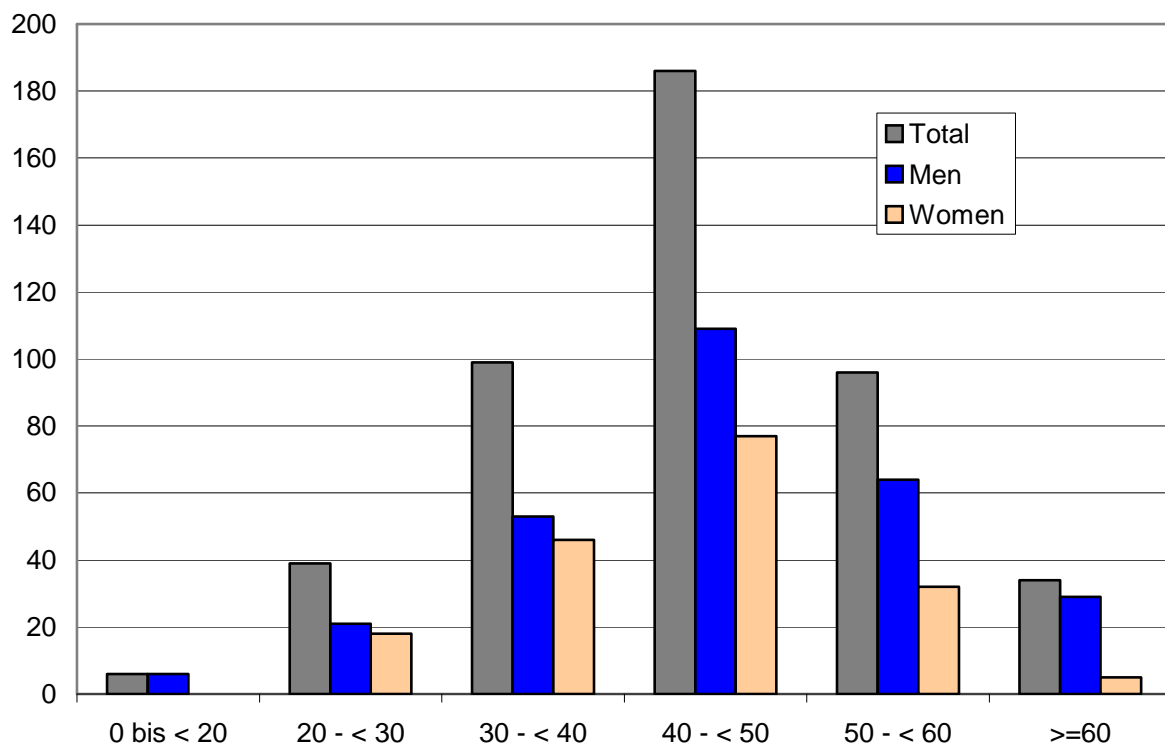
3.1 Demographic Classification of the Survey Participants

About 60 percent of the participants were men, and accordingly 40 % women. Overall persons between 10 and 80 years of age participated (Figure 1). The age group between 30

and 60 years of age can be seen as the majority, set by 80% of the participants. Here, one can not speak neither of an ‘youth movement’ nor of an aging group of participants, even if a distortion toward younger participants can be assumed due to the use of Internet for the survey. Particularly in the age group of above 40, or rather above mid-40s, more men than women participated in the survey. In this regard, the survey is in accord with the age profile of Internet users in Germany.

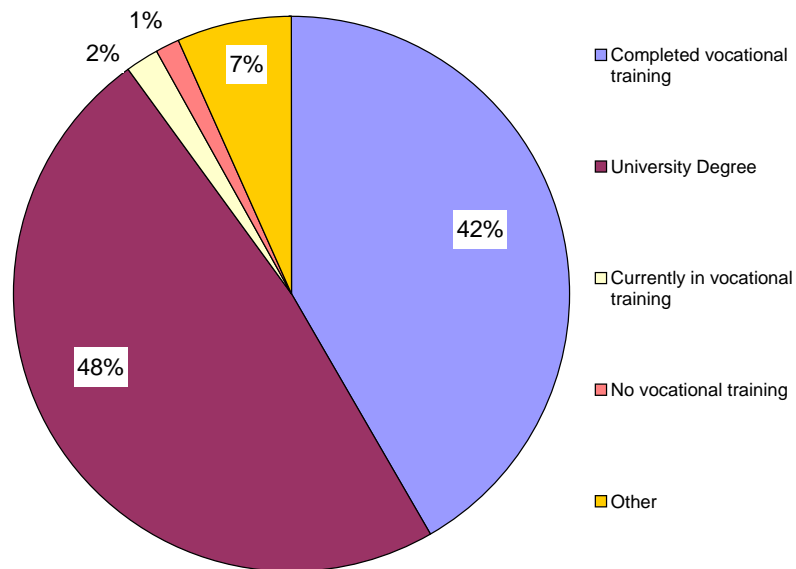
More than half of the participants come from households with children (in Germany a total of 53 %), slightly more than 30 % (DE= 30 %) come from multiple households without children and a scant 15 % (DE= 17 %) come from single households (information on DE comes from the GERMAN STATISTICS OFFICE, 2006, P. 27). Considered in terms of household form, the activity fits with the overall situation in Germany. This means that in the survey, no lifestyles are particularly conspicuous in terms of extraordinarily intensive or extremely little to do with the topic of conservation of rare animals or plants.

Figure 1: Age and Gender Distribution of Survey Participants



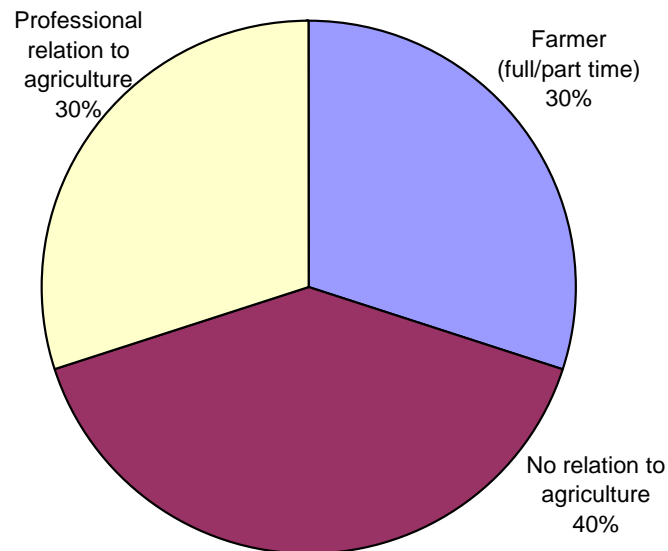
With regard to the educational situation, the profile of survey participants confirms the findings mentioned earlier that a large affinity to the field of biological diversity exists in population groups with a higher educational level (Figure 2).

Figure 2: Educational Level of Survey Participants

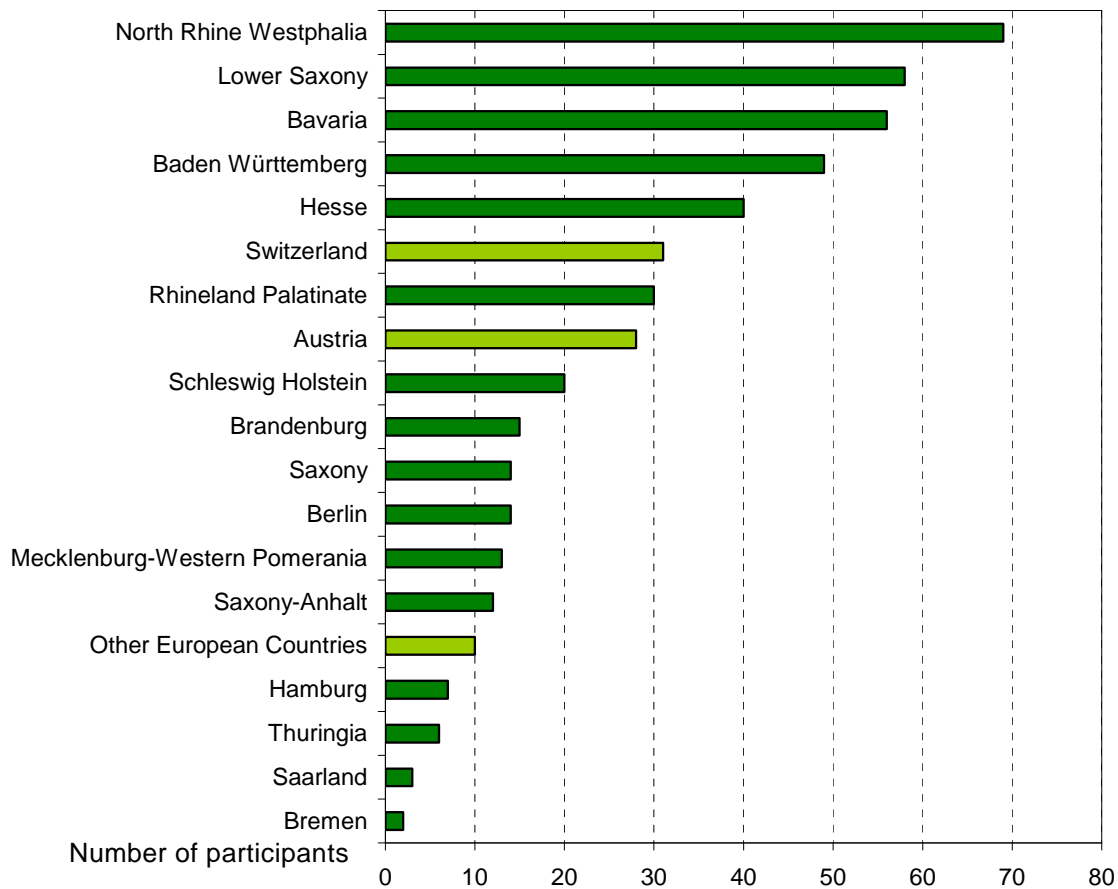


The employment situation of participants was also questioned in relation to its proximity to agriculture, to see if the conservation of rare animals and plants is more likely to be conducted by persons with a relationship to agriculture (Figure 3). In this survey, 60 % of the participants had a tie to agriculture, either because they own a full or part time farm or exercise a profession related to agriculture. Nonetheless, 40 % are involved in this topic without a relationship to agriculture. Here it is also significant that 70 % of the participants do not own a farm, but still are involved in the maintenance of rare animals or plants. Apparently this is not a field predominantly led by farmers.

Figure 3: Professional Orientation of Survey Participants

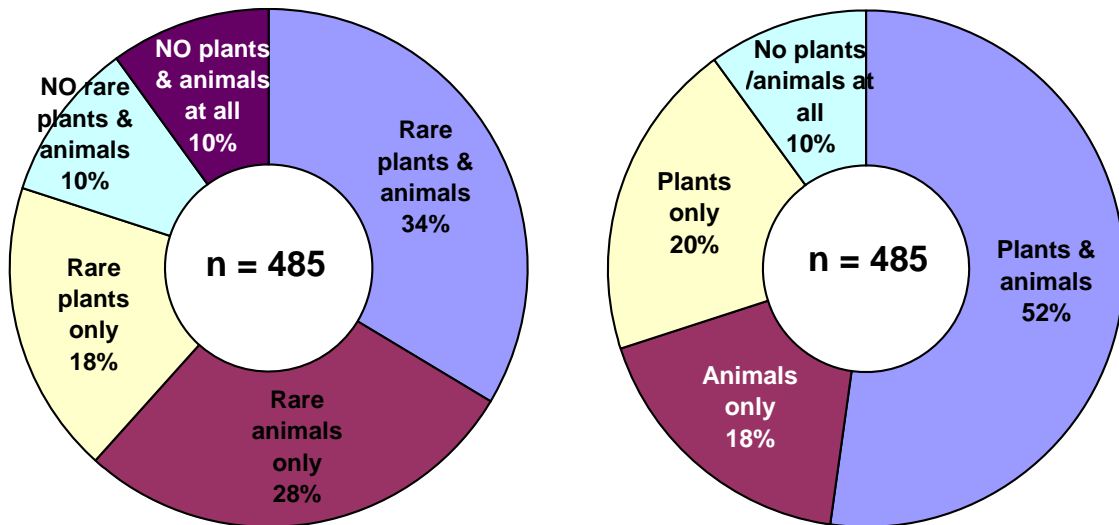


Of participants in the survey, 85 % came from Germany, and about 30 participants (6 %), each from Switzerland and Austria, while an additional ten persons (2 %) came from other European countries (Figure 4). The subsequent analyses showed no pointed differences in the response behaviour between persons from Germany and those not living in Germany, so no separate presentation will be included in the following.

Figure 4: Participant Origin

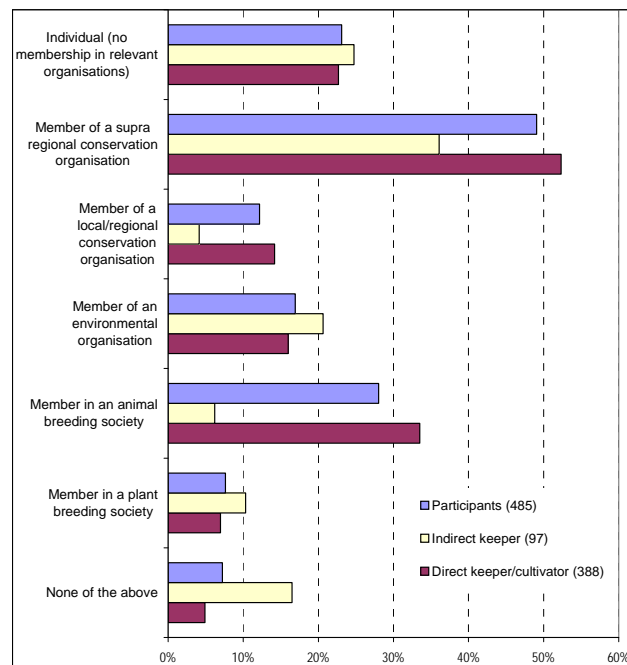
3.2 Opinions of the Participants

On the right side of Figure 5 the percentage of animal keepers or plant cultivators overall is featured. If one considers the concrete fields of activity, then 90 % of the people who took part in the survey are animal keepers or plant cultivators. A scant majority keeps both animals and plants. And one-fifth each cultivated only plants or kept only animals. The pie chart on the left side of Figure 5 indicates that the survey apparently addresses particularly active animal and plant keepers, since 80 % of the participants actively keep rare plants or animals. In conservation, animals and plants are kept less frequently in combination.

Figure 5: Cultivation of Plants and Animals by Survey Participants

Half of the participants are organized in supra regional associations or initiatives (Figure 6). Members of breeding, environmental and local clubs are especially recruited from this group of persons. In any case 123 persons, or 23 % of the participants, are not linked to a club or initiative. In the rubrics “Member in an animal breeding organisation” and “Member in a local or supra regional association/initiative,” direct keepers are more active as indirect keepers.

Figure 6: I am active in conservation activities as... (Multiple responses possible; Response quota = 478 of 485 (99 %))



Participants were also asked about the time investment for their conservation activity. Here the concrete time invested in hours per week in the past 12 months was inquired.

A total of 351 (70 %) of the persons gave information on weekly hours. On average slightly more than 13 hours per week were invested in conservational activities, but with a broad range. The median⁶ was 10 hours/week. Figure 7 shows the distribution of the responses in hour/week classes. In Table 2 the average hours per week between different groups of participants were compared. Here a higher work intensity was expected from animal keepers and sellers (feeding, stable work, sales activity), which was confirmed. Surprising in contrast is the low number of hours in the case of exclusive plant cultivators, while the somewhat less than average input by indirect keepers is in accordance with expectations.

⁶ Median (or central value) indicates a limit between two halves. In statistics the median halves a sample.

Figure 7: Average hours per week invested by participants (Response from 351 of 485 respondents)

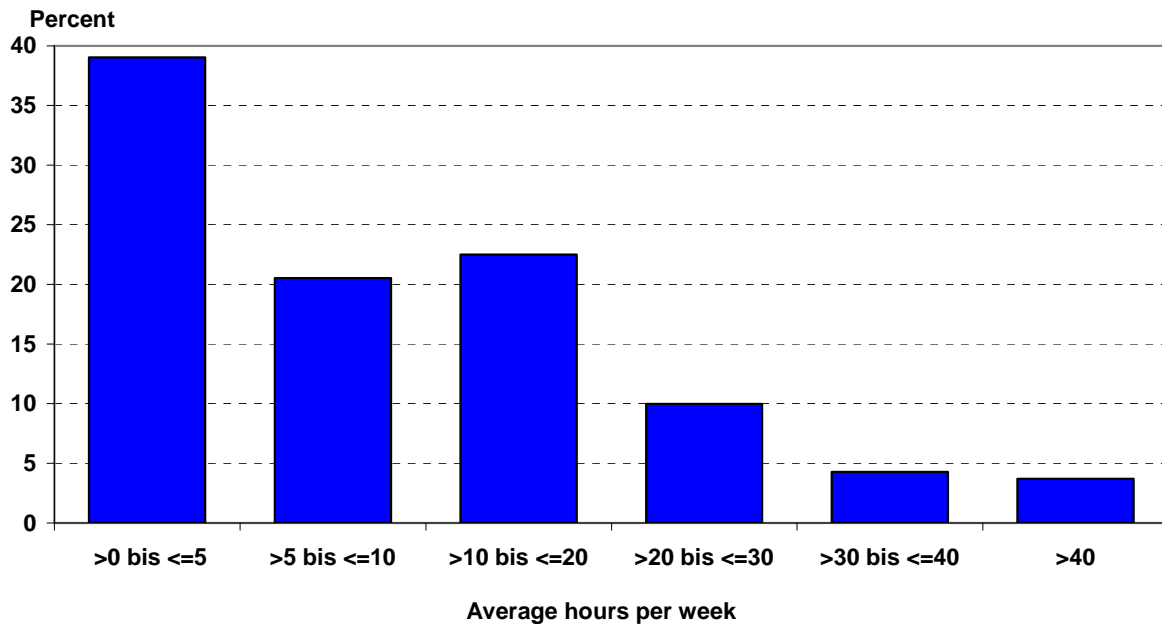


Table 2: Time Input in Relation to Conservational Activity

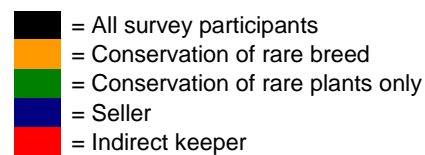
Participant Group	Responses	Mean	Std.Dev.
All Participants (485)	351	13.6	15.1
Conservation of Rare Animals (299)	238	15.4	16.0
Exclusively conservation of rare plants (89)	66	8.8	12.1
Sale of products from the conservational activity (256)	204	16.4	15.9
Indirect Keepers (97)	47	10.9	12.6

Furthermore with the personal estimates, the conscious value statement “I invest pretty much time in this type of conservational activity” should communicate how far the own involvement is judged to be intensive. Overall the time investment is considered high (Table 3). The estimates of the survey participants are about covered by the actually invested average time, meaning the higher the average weekly time investment is, the stronger the statement about a great deal of time invested is supported.

Table 3: Assessment of time input by various groups of participants

Question	n	Ans.	μ	σ	Not at all true ← → Completely true									Don't know (5)	
					1	1,5	2	2,5	3	3,5	4				
I invest pretty much time in such conservational activities	485	461	3	0,9											19
	299	287	3,2	0,8											8
	89	86	2,9	0,9											2
	256	246	3,8	0,4											5
	97	88	2,6	1,1											9

(n = Total)
 (μ = Mean)
 (σ = Standard Deviation)



 = All survey participants
 = Conservation of rare breed
 = Conservation of rare plants only
 = Seller
 = Indirect keeper

In summary, the results show that on average the participants invest more than 10 hours per week, meaning one quarter of the standard work week. Thus they are very active in conservational activities. This was also perceived as being so by those involved. The conservational work of those surveyed is thus marked by initiative and enthusiasm, particularly when rare animals are kept and marketing activities are brought in.

The topic conservation of rare plants or animals is not just a topic for agricultural-horticultural breeding, but originally a topic of direct agricultural-horticultural practice. While plant breeding in the course of the past century wandered almost completely into special companies (BDP, 1987; EFKEN, 1998, p. 158), animal breeding of cattle, horses, sheep, goats and partially also pigs, still takes place in agricultural practice (BARTH et al., 2004a, P. 20; 2004c, P. 30). In the case of poultry, breeding is exclusively in the hands of specialized breeders in so far as the breeding of high performance breeds for broad agricultural practice are the focus (BARTH et al., 2004b, P. 60). Also in breeding marked strongly by agriculture, current performance advances stand at the forefront. Here in the same way as in the specialized breeding firms, only a few breeds/races are used. Thus the conservation of rare plants or animals, depending on the perspective, presents a supplement or contra reaction of the dominant established breeding. From this very brief description, two characteristics can be filtered out: first the process is a typical agricultural horticultural activity. Second, the conservation of rare plants or animals differs clearly in the target catalogue from the common modern agricultural and horticultural practice, since the latter does not include the conservation of genetic diversity or place a priority on it.

On the basis of these considerations, it makes sense to find out which opinions or attitude persons involved in the conservation of rare plants and animals have to agriculture and breeding. For this reason consciously polarizing statements were formulated in order to challenge the participants to take a position.

The results presented in Table 4 show a relatively clear pattern of attitudes on the part of the participants. In addition to the results of all participants, the results of four different groupings were illustrated: first the direct and indirect conservers; both groups exclude each other. The fourth group are persons who sell products from conservational activities, they are a subset of the direct conservers. The fifth group is the result of the survey results. Over 90 % of those surveyed prefer organically directed agriculture and support stronger state support for organic farming. Another opinion here was held by only 32 people or 7 %, that for this reason are presented as a separate group in the further criteria presented in Tables 4, 5 and 6.

Unanimous support was voiced that the government should do more for the conservation of biological diversity. This will probably not surprise anyone. Under the rightful assumption that the circle of participants is comprised primarily of experts, the current government activities in this field were judged poorly. The statement on the high level of state control on seeds and varieties and the explicitly provocative statement on the public support of established breeding, in particular through the use of provocative words “large breeders” and above all “concerns” should filter out to what extent the participants see themselves as an opposition movement and in how far institutional framework conditions are perceived as the cause of poorly developed situations. Both statements tended to be completely accepted by the participants. Those who were not active in the conservation of cultivated plants and animals, as well as the “Eco-sceptics” did not support the statement as strongly. Further a good 20 % of those surveyed answered this statement with “I don’t know.” As a consequence the forming of the varieties protection law and the seed trade law was under criticism by the participants, the majority were even clear in their criticism. The participants see the large breeders and companies exclusively as protégées of the state.

Table 4: Evaluation of Agriculture and the Protection of Genetic Resources of Various Groups of Participants

Question	n	Ans.	μ	σ	Not at all true ← → Completely true									Don't know (5)	
					1	1,5	2	2,5	3	3,5	4				
Organic farming is clearly preferable to conventional agriculture	485	475	3,6	0,7											11
	388	384	3,6	0,7											9
	97	91	3,6	0,7											2
	256	253	3,5	0,8											7
	32	32	1,6	0,5											0
The government should support organic farming more strongly than conventional agriculture	485	473	3,5	0,8											11
	388	383	3,5	0,8											9
	97	90	3,5	0,8											2
	256	252	3,5	0,8											6
	32	32	1,6	0,5											0
The government should do more to maintain biological diversity	485	474	3,8	0,5											2
	388	384	3,8	0,4											2
	97	90	3,8	0,5											0
	256	253	3,8	0,5											2
	32	32	3,3	0,9											0
The state controls far too much in the area of seed and varieties	485	471	3,3	0,8											111
	388	381	3,4	0,8											84
	97	90	3,1	1											27
	256	251	3,4	0,8											60
	32	31	3	1											6
With the seed and varieties laws, the state protects above all large-scale breeders and concerns.	485	473	3,7	0,7											80
	388	381	3,7	0,6											60
	97	92	3,4	0,7											20
	256	250	3,7	0,6											42
	32	32	3,1	1,1											7
The state controls far too much with its animal breeding laws	485	467	3	1											134
	388	382	3	1											98
	97	85	2,7	1											36
	256	249	3	0,9											52
	32	31	2,7	1,2											7



In the area of animal breeding law, the judgement is less clear. Almost 30 % answered “I don’t know” to this statement. Those who took a position judged a excessive number of laws on average as more the case. An explanation for the veiled criticism of the animal breeding laws could be the breeding practices rooted even more strongly in agriculture, which ultimately can be found in the according laws.

As the characterization of the participants showed, the sale of products from conservation activities is often linked directly to husbandry. In how far this conservation activity can be seen as an unavoidable problem or as a natural part of the conservation of rare plants and animals should be clarified with another block of statements (Table 5). Among all participants, as well as the groups built, the sale of products from conservational activities is very strongly supported, there is no resentment against a commercialization of the conservational activity. The assessment of the economic sustainability of direct conservational work is rather modest. None of the participants noted particularly positive economic perspectives in the conservation of rare plants or animals. Apparently this activity is not perceived by experts to be a lucrative niche from an economic perspective. However, the participants appear to be convinced of the attractiveness of the products to be won from rare plants and animals.

In order to complete the picture, in addition to the question on attitudes on marketing or commercialization in the conservation work, an attempt was made to find the own inclination or preparedness to conduct entrepreneurial activities (Table 5, lower part). With regard to the option to earn money with conservational work, agree and disagree answers were about balanced. People who kept rare animals and plants, and above all those that currently sell products from these activities, tend to be more positively inclined to this option. Apparently there is no lack of ideas or thoughts for business ideas in this area.

The extent to which interest in entrepreneurial activity is present was checked in more detail. The basis is the interpretation of on-farm management as a conservational activity with links to the consumer, or rather, the market. Under these premises a conservational activity would not be sufficient if the readiness to sell the products were lacking, meaning that the motivation be to reach consumers with the diversity and not just one's own garden.

Of those questioned, 202 (= 42 %) were self-employed. That is a very high percentage as compared with the entire population: according to a micro-census in 2004, the self-employment rate of all occupations in Germany is about 10 % (DESTATIS et al., 2007). This group proved that it can be entrepreneurial. The interest in the survey was more in the direction of the 283 (= 58 %) people who are at the moment not self-employed, in order to find out how much untapped potential for entrepreneurial dealings is available. In Table 6, of the 283 people who are at the moment not self-employed the number of

Table 5: Attitudes towards the sale of products from conservation activities of different groups of survey participants

Question	n	Ans.	μ	σ	Not at all true ← → Completely true					Don't know (5)	
					1	1,5	2	2,5	3		3,5
The sale of seeds/plants or breeding animals, but also of other products (fruits, vegetables, animals, bread, juice, meat, etc.), serves to maintain rare cultivated plants and animals	485	476	3,8	0,5							4
	388	381	3,8	0,5							3
	97	95	3,7	0,6							1
	256	252	3,8	0,4							0
	32	32	3,7	0,8							0
Whoever can earn money with rare cultivated plants and animals should certainly do it	485	476	3,6	0,7							19
	388	382	3,6	0,7							16
	97	94	3,6	0,7							3
	256	252	3,7	0,6							7
	32	32	3,5	0,9							4
Rare cultivated plant crops are not economically viable	485	475	2,4	0,8							92
	388	382	2,4	0,9							79
	97	93	2,5	0,8							13
	256	252	2,4	0,8							56
	32	32	2,5	0,8							6
Keeping rare animal breeds is not economically viable	485	471	2,3	0,9							65
	388	381	2,25	0,9							49
	97	90	2,5	0,8							16
	256	251	2,3	0,9							21
	32	32	2,3	0,8							4
Products derived from rare cultivated plants or animals are not attractive for today's consumers	485	478	1,8	0,8							15
	388	383	1,7	0,8							12
	97	95	1,9	0,8							3
	256	254	1,7	0,8							8
	32	32	1,9	0,9							1
Question	n	Ans.	μ	σ	Not at all true ← → Completely true					Don't know (5)	
I certainly have one or two business ideas that I believe could be successful	485	475	2,9	1							20
	388	382	2,9	0,9							16
	97	93	2,6	1							4
	256	252	3,2	0,8							6
	32	32	2,9	1,1							1
I can imagine earning money with conservational work	485	473	2,6	1							29
	388	381	2,7	1							23
	97	92	2,5	0,9							6
	256	250	2,9	0,9							11
	32	3,2	2,8	1,1							2

- = All survey participants
- = Direct keeper/cultivator
- = Indirect keeper
- = Seller
- = Eco-sceptic

(n = Total)
 (μ = Mean)
 (σ = Standard Deviation)

Table 6: Attitudes toward entrepreneurship and market economy in different NON self-employed (283 of 485) groups of participants

Question	n	Ans.	μ	σ	Not at all true ← → Completely true					Don't know (5)		
					1	1,5	2	2,5	3		3,5	4
I find the idea of being self-employed somewhat intriguing	283	271	2,6	1,1								10
	217	210	2,6	1,1								7
	66	61	2,6	1,1								3
	120	114	2,8	1								4
	18	18	2,7	1,3								1
I don't have enough money to be self-employed	283	267	2,7	1,1								13
	217	207	2,7	1,1								9
	66	60	2,7	1,1								4
	120	112	2,8	1,1								5
	18	17	2,9	1,1								1
I don't want to jeopardize my current situation by becoming self-employed	283	266	2,9	1,1								19
	217	205	2,9	1,1								15
	66	61	2,9	1,1								4
	120	109	3	1								8
	18	18	3,1	1								1
I don't feel competent in things like bookkeeping and personnel management	283	265	1,8	0,9								16
	217	204	1,8	0,9								13
	66	61	1,8	0,9								3
	120	109	1,7	0,8								6
	18	17	1,7	0,9								2
I relate the term self-employed to things like independence, courage, assertiveness, strength and responsibility	283	271	3,4	0,7								18
	217	209	3,4	0,7								13
	66	62	3,3	0,6								5
	120	116	3,3	0,7								6
	18	18	3,1	0,6								1
I relate the term self-employed to things like stress, overwork, overwhelming, disquiet	283	270	2,5	0,8								21
	217	208	2,5	0,8								15
	66	62	2,5	0,9								6
	120	115	2,5	0,8								8
	18	18	2,2	0,8								1
In general a free market is necessary so that a society can live in prosperity	283	269	3	0,9								38
	217	207	3	0,9								27
	66	62	3	0,8								11
	120	114	3,1	0,8								16
	18	18	3,1	0,8								4



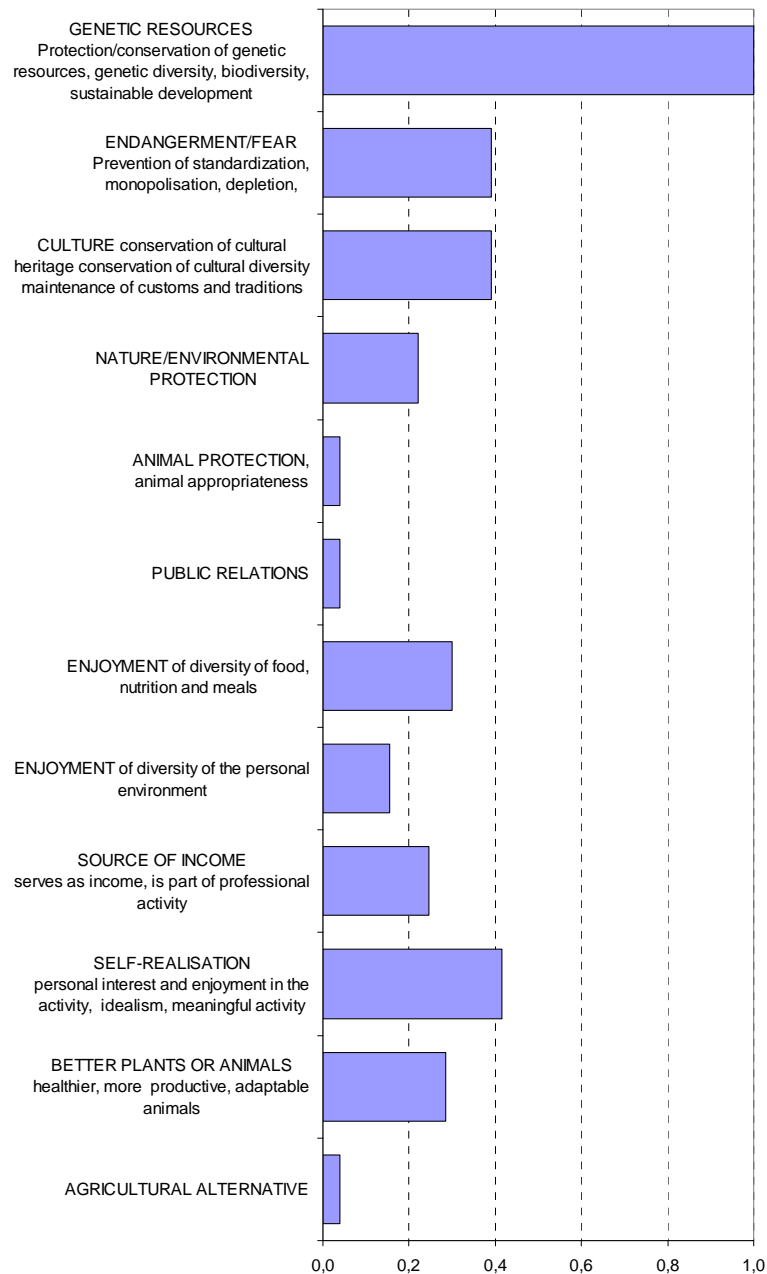
proponents and adversaries to the statement “the thought of being self employed interests me a little” was about balanced, whereby persons with marketing experience tended to

judge positively. Through the related evaluation of a further six statements it can be seen that particularly the own professional status may not be endangered through entrepreneurial, and thus risky, dealings. Furthermore financial restrictions play a role. The attitude toward independence as well as to entrepreneurial type is clearly positive, as indicated to the above average general response to a free market. This result is in accordance with the results of representative online surveys (PERSPECTIVE GERMANY, 2006).

This result is of significance, particularly in comparison to the judgement of the situation of agricultural and breeding practice. Apparently the critique on the situation of plant breeding and the neglect of genetic diversity both of plants and animals are not paired with a general critique on the existing economic system. Quite the contrary, the existing economic system and the decisive element of the entrepreneur are judged positively.

At the end of the questionnaire, participants had the chance to put their reasons for conserving rare plants or animals into their own words. A total of 380 persons, or 80 % of the participants took advantage of this opportunity. These observations contain an enormous amount of information. In order to make use of them, it is necessary to develop statement categories so that statements similar in content can be summarized. Results are presented in a summary in Figure 8. The frequency of the responses gives no exact information on the number of participants since in the answers often multiple topics were addressed, thus partial answers are considered in two or three topic areas. The topic conservation of genetic resources is mentioned most frequently. Based on the number of mentions, the mentions of other topics are scaled so that Figure 8 reflects a weighing of frequency with which the topic was mentioned

Figure 8: Frequency of mentions of a topic in the answering of a question „I am involved with the conservation of rare plants or animals because“ (Responses from 380 of 485 surveyed)



The conservation of diversity dominated the topics in the answers. The responses permitted a breakdown according to conservation of genetic resources and conservation of cultural diversity as well as diversity of treatment. The activity was not limited to breeding, but participants see their activities as a contribution to conservation of cultural aspects

(for example, cultural heritage): Clearly expressed in this statement is the diversity of food and nutrition.

The topic “self realisation” was also a significant topic. It was mentioned directly or expressed in the form of “fun in the activity” or “personal meaning.” One reason stated often for the conservational activities was that in contrast to modern bred varieties and species, healthier and more robust plants and animals were dealt with here.

3.3 Shape of Conservation of Rare Cultivated Plants and Animals in the Survey Participants

In the following, the concrete conservation of rare plants and animals are described in detail. In the questionnaire it is asked whether rare plants and animals are planted or kept and further whether rare plants or animals are currently being kept. If this were to be the case, the land area used and the number of varieties of rare plants or rather the number of species and the number of rare animals kept were given.

3.3.1 Planting of cultivated plants or rare cultivated plants

349 persons plant cultivated plants of which 252 also grow rare cultivated plants (Figure 9). The emphasis is, on the one hand, on typical garden plants which only use a minimal amount of land, and the other on arable cultures. The selection possibility “Other, namely ____” was chosen 40 times. Particularly fodder plants, wild vegetables, wild fruit and wild herbs as well as individual special plants were mentioned.

Figure 9: Number of persons planting the following cultivated plants ('species-groups')

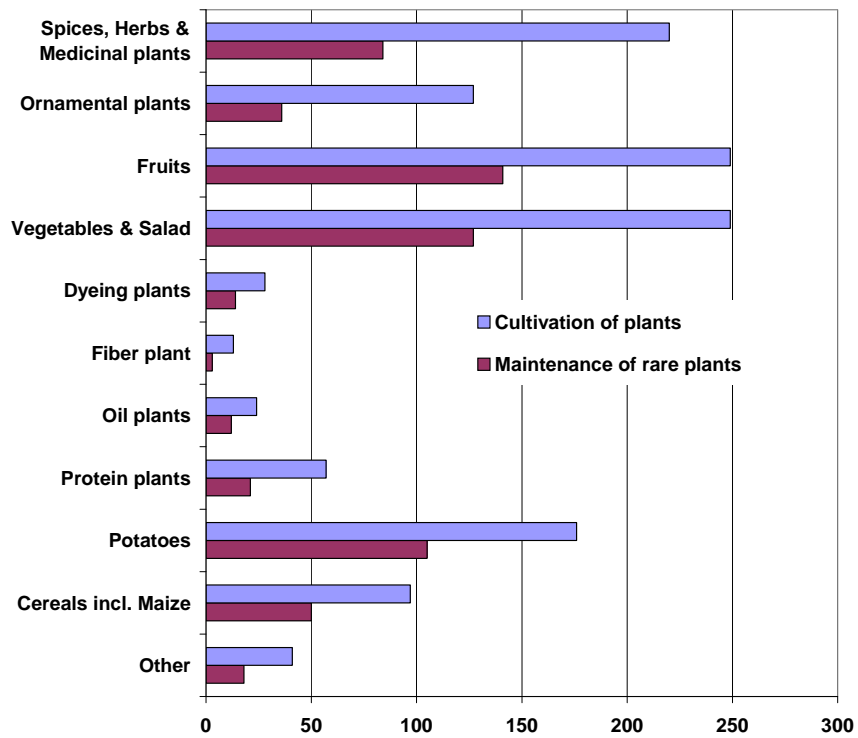
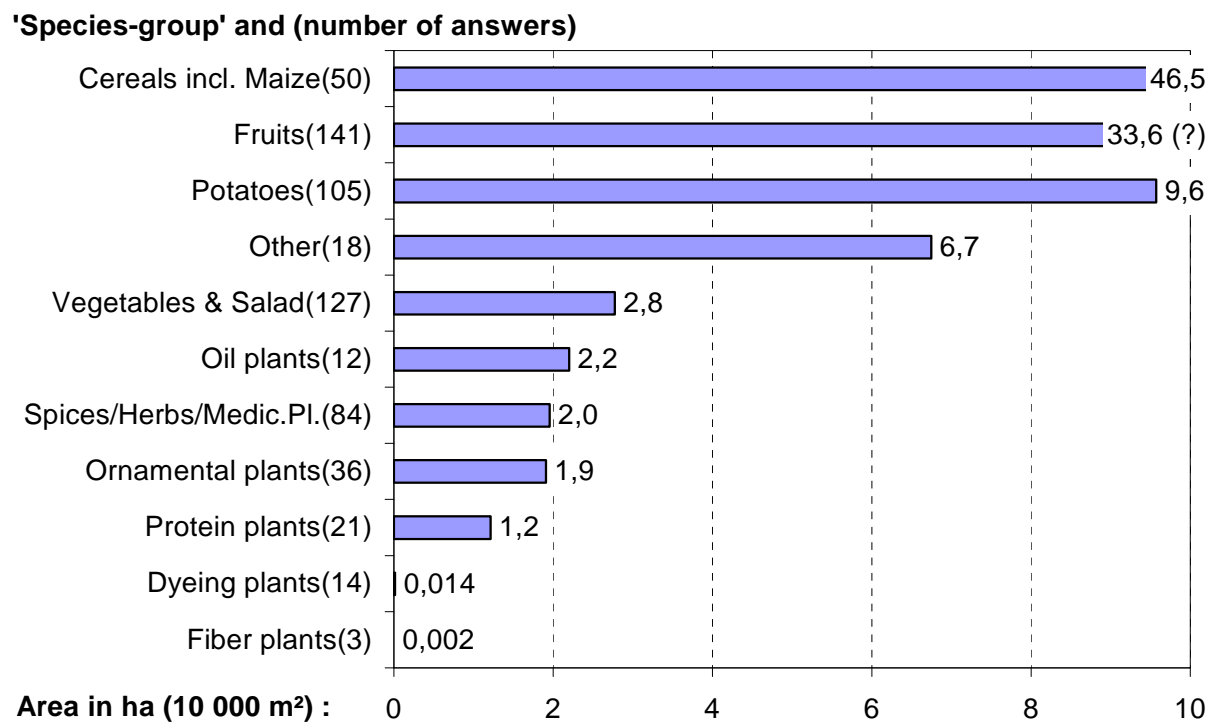
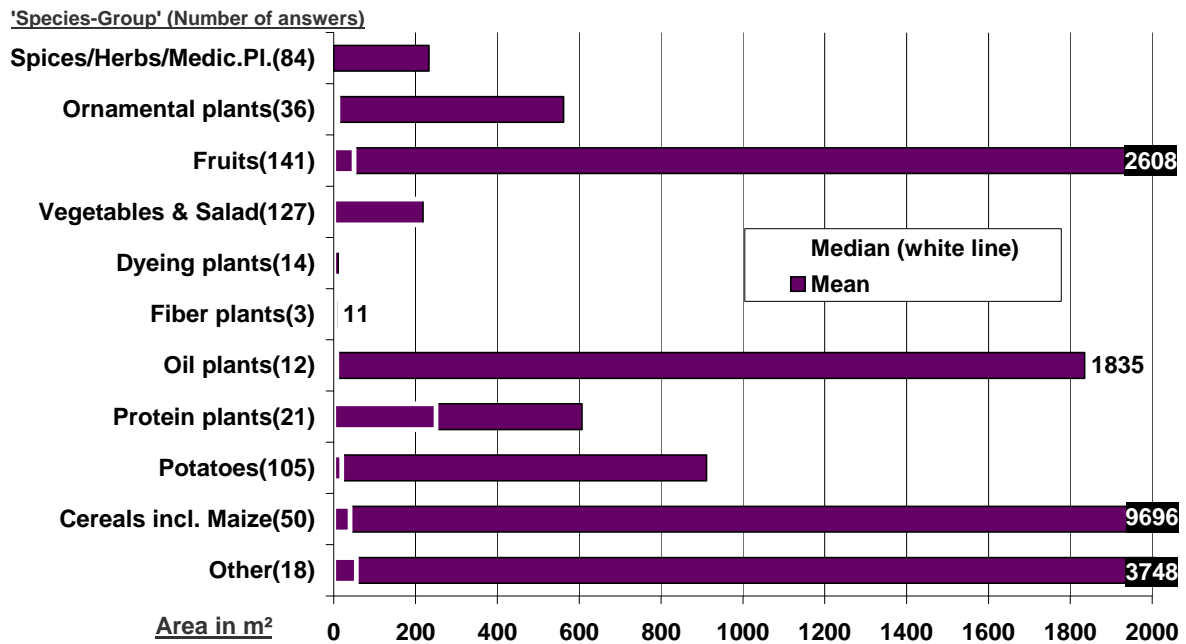


Figure 10: Land area used (overall) for the planting of rare cultivated plants by participants



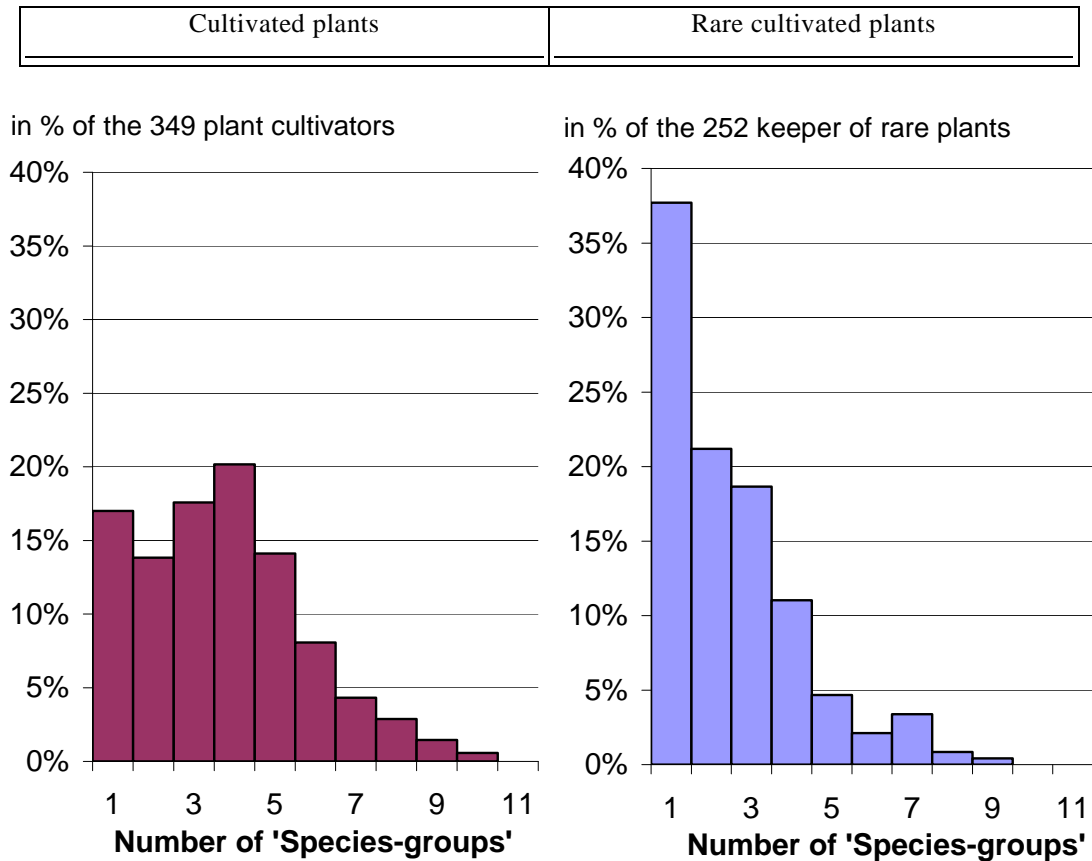
In Figure 10 the total land area used for planting rare cultivated plants is presented. The information on fruit trees probably contains errors since, in contrast to all other categories, which were to be given in square meters, here the number of plants was given. It appears to partially be overlooked, because the total number of 336 000 plants is quite high 33.6 ha of fruit tree area is more likely. In the land area intensive cultures like cereals and potatoes accordingly large areas were used. Overall the information shows the limited extent of land used for the conservation of rare plants.

It is conspicuous that in regard to the average land area used, a small group of persons uses a large amount of land, so that the mean is very strongly above the median (see Figure 11). In the median, half of the participants use less land and half of the participants more land. More or less all species and varieties show this skewed distribution. It is striking in the case of cereals. There appear to be many people who plant cereals on small land areas of few square meters, while the average of a scant hectare more likely reflects usual crop circumstances. Particularly farmers responded that they use above average sized land areas.

Figure 11: Average and central (median) land area used to plant rare cultivated plants

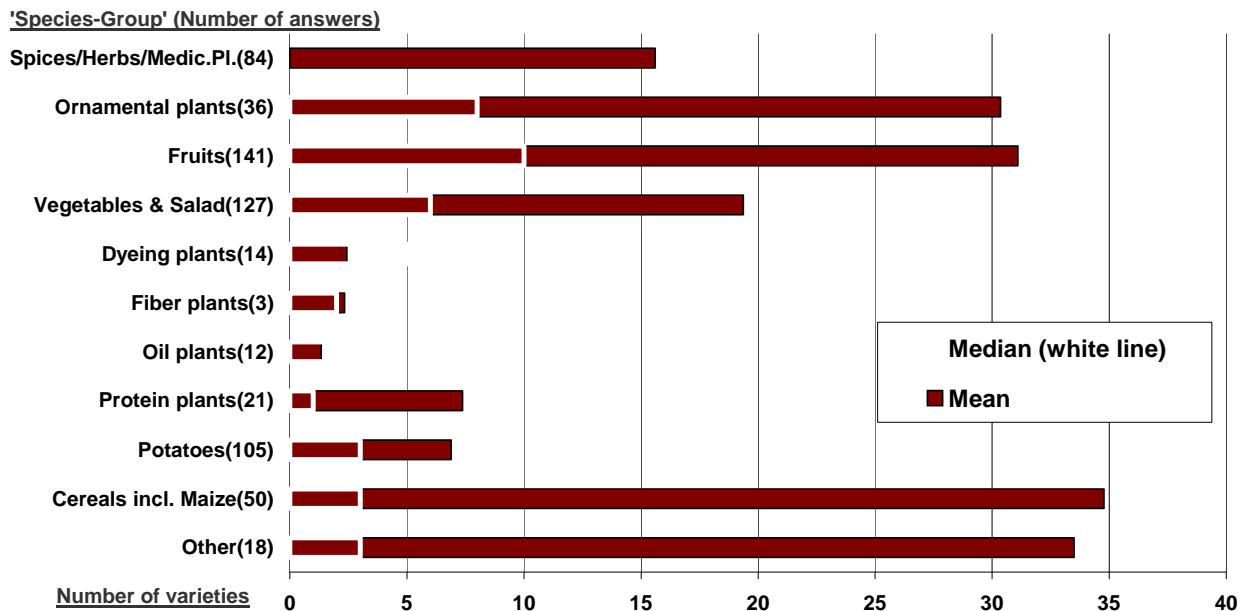
Whoever plants crops frequently uses varieties from the different species groups mentioned here (see Figure 12). Those conserving rare plants do this much less frequently with varieties from different species groups, as the comparison of cultivated plants vs. rare cultivated plants in the figure shows.

Figure 12: Percentage of persons according to number of species of plants or rare plants kept



But in conservation many different varieties of one species are planted (see Figure 13): there is no concentration of one variety, rather quite the contrary, on average mostly 5 to 35 varieties are used. The high average number of varieties per conservator is caused particularly by some single reports that plant an very above average number of varieties (Difference median to mean).

Figure 13: Average and Median number of varieties in the planting of rare cultivated plants



Both the information on land area used, as well as on the number of varieties, indicate that the majority of the direct conservers are very intensively engaged in practical conservation efforts.

In conclusion, Tables 7 and 8 show favoured pair combinations. As was expected, Table 7 reveals that particularly typical garden species (vegetables, herbs, decorative plants, fruit) are often combined. This ultimately reflects the common practice of horticulture, at least in the case of private gardens. Reasons for this, are in addition to individual preferences, crop rotation restrictions and the various seeding and plant time points as well as harvest time points for the cultures. In addition, the relative simplicity of the cropping for various cultivated plants certainly plays a role as well.

Table 7: Paired combinations in the planting of cultivated plants

	Cereals incl. Maize	Potatoes	Protein plants	Oil plants	Fiber plants	Dyeing plants	Vegetable s & Salad	Fruits	Ornament al plants	Spices/He rbs/Medic. Pl.	Other
Cereals incl. Maize	97										
Potatoes	60	176									
Protein plants	37	40	57								
Oil plants	20	17	18	24							
Fiber plants	9	8	7	5	13						
Dyeing plants	11	19	11	5	7	28					
Vegetables & Salad	72	152	48	19	11	24	249				
Fruits	68	135	46	18	10	22	184	249			
Ornamental plants	47	81	33	15	11	21	116	104	127		
Spices/Herbs/Medic.Pl.	61	128	44	17	11	28	193	173	116	220	
Other	16	21	12	6	1	8	21	24	14	21	41







 Number of persons who cultivate plants in this 'Species-group'
 Dark green  if within a paired combination more than 75 % of one side use this combination
 Light green  if within a paired combination more than 50 % of one side use this combination

Table 8: Paired combinations in the planting of rare cultivated plants

	Cereals incl. Maize	Potatoes	Protein plants	Oil plants	Fiber plants	Dyeing plants	Vegetable s & Salad	Fruits	Ornament al plants	Spices/He rbs/Medic. Pl.	Other
Cereals incl. Maize	48										
Potatoes	30	105									
Protein plants	12	16	20								
Oil plants	8	8	7	12							
Fiber plants	2	1	1	2	2						
Dyeing plants	2	7	4	3		13					
Vegetables & Salad	29	67	18	9	1	10	127				
Fruits	22	52	11	7		6	64	129			
Ornamental plants	13	21	6	5	1	6	24	25	34		
Spices/Herbs/Medic.Pl.	18	43	14	7		11	61	52	25	84	
Other	6	8	4	2		3	8	6	4	6	18

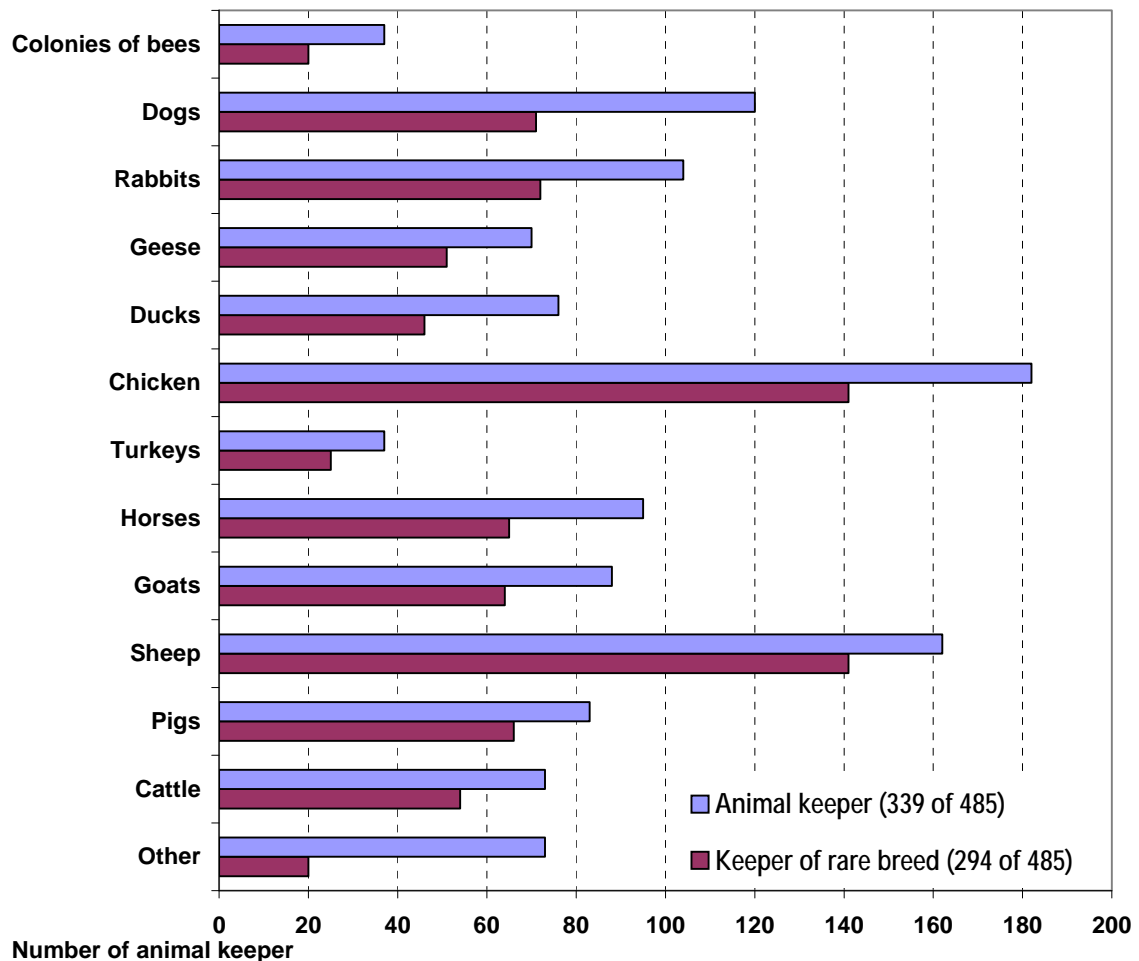
 Number of persons who cultivate plants in this 'Species-group'
 Dark green  if within a paired combination more than 75 % of one side use this combination
 Light green  if within a paired combination more than 50 % of one side use this combination

Even if many combinations of different varieties are practiced with different species, the intensity is clearly less in comparison to the cropping of cultivated plants on the whole (Table 8) The conservers seem to concentrate on a few species with regard to their conservational activities.

3.3.2 Keeping Farm Animals or Rare Farm Animals

Of the 339 animal keepers, 294 keep rare breeds. Sheep and poultry are very frequently kept (Figure 14). The high values of the individual rubrics show that a multiplicity of varieties are kept. Under the rubric “Other, namely...” 72 participants gave additional information. A total of 31 cats, 19 mules, and 13 different decorative birds as well as exotic species were mentioned.

Figure 14: Number of persons keeping the following species



Relatively large numbers of sheep and poultry are kept (Figure 15). But even in the case of cattle and pigs, which require a great deal of care, more than 1000 rare animals are kept. This is also reflected in the average number of animals kept (Figure 16). Surprisingly more keepers were likely to hold larger animals, which is not immediately clear.

This fact becomes clear when considering that participants with farms keep larger numbers of large animals. In comparison to the analysis of cropping of rare plants, it is evident that the difference between the average and median are not great. In other words, keeping rare animals is not as marked by differences with regard to the number of animals kept.

Figure 15: Total number of rare animals kept by respondents

Species (Number of answers

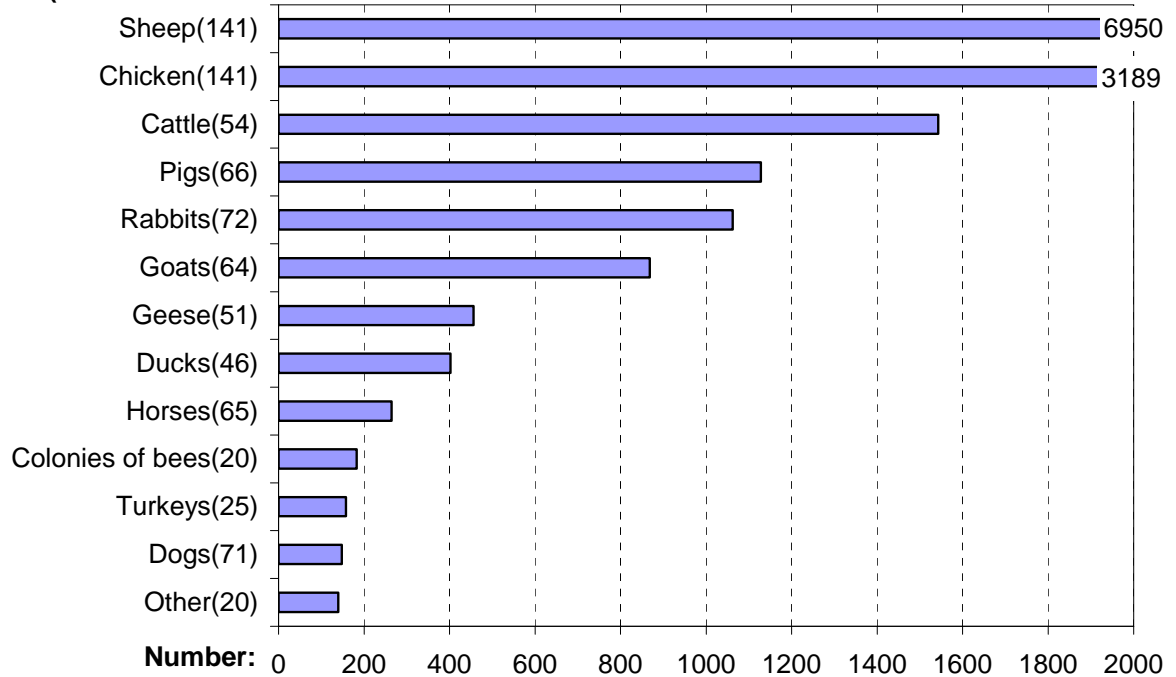
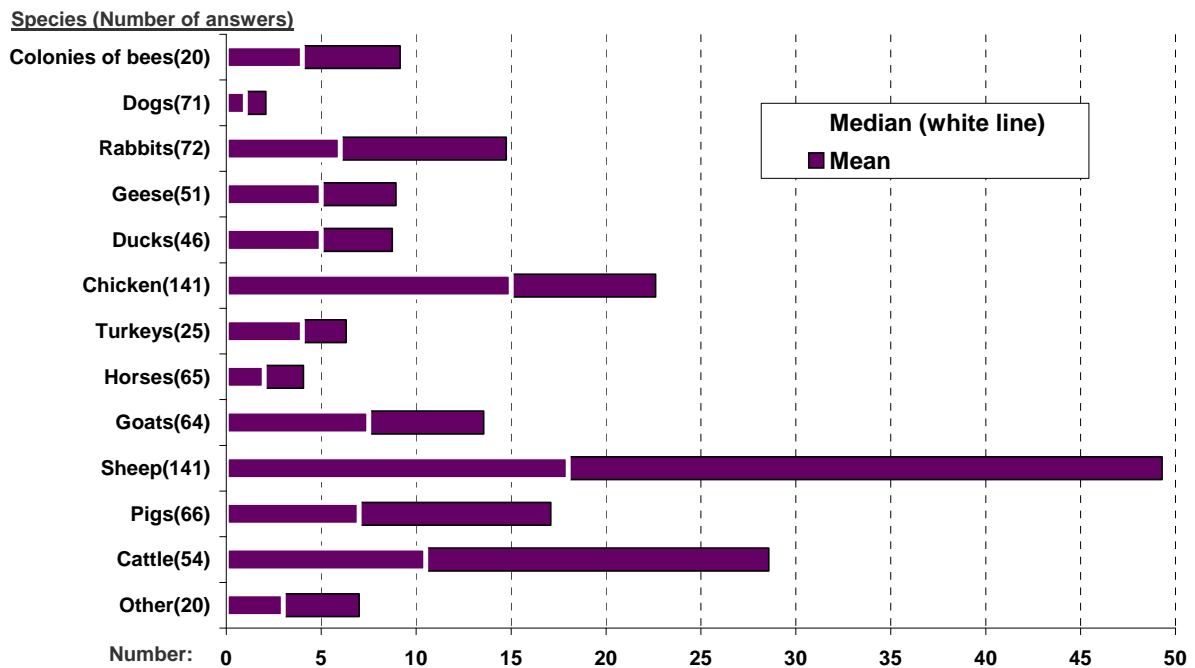
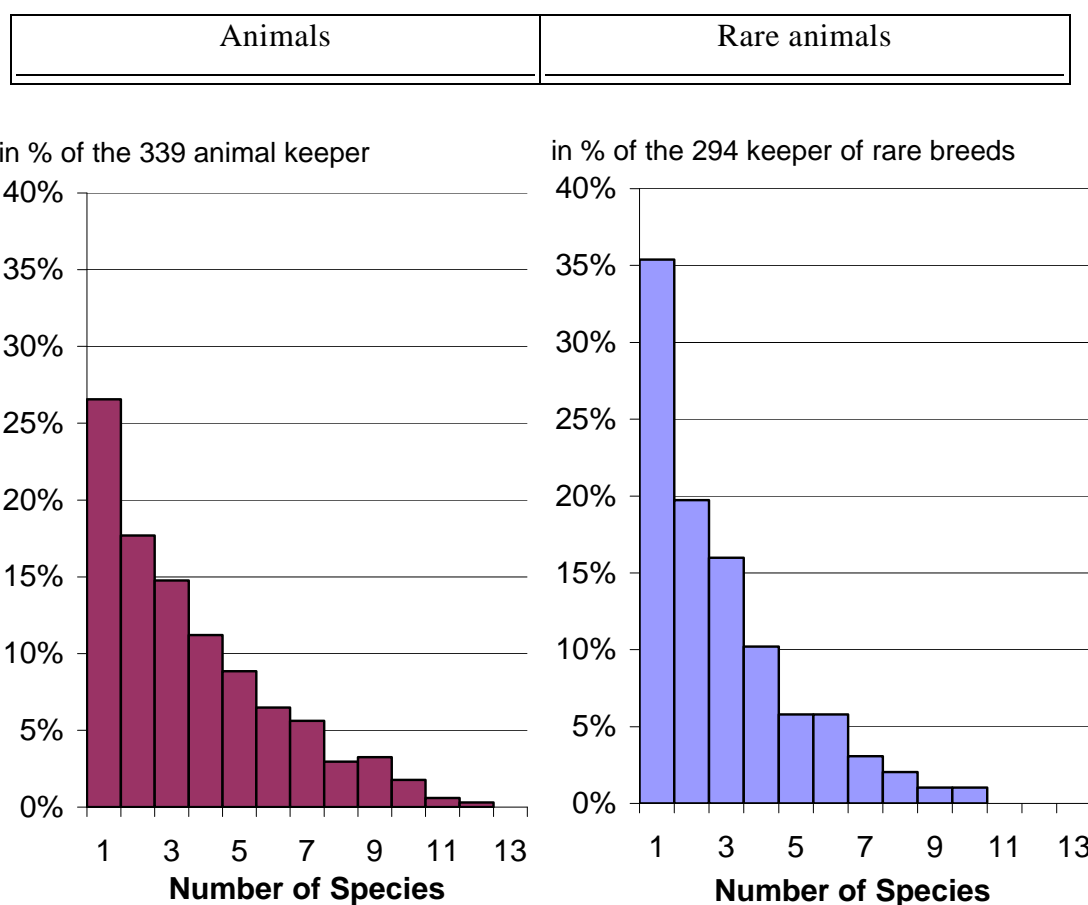


Figure 16: Average and median numbers of rare animals kept

In addition to the number of cultivated animals or rare cultivated animals kept, the number of species held in each case is also of interest (Figure 17). One quarter of the animal keepers kept only one type of animals, while more than half of the respondents have more than two types. As in the analysis of the plants, the picture changes in animal husbandry with regard to the keeping of rare animals. Those keeping rare animals do this less frequently with more different types than those keeping normal animals. Thus, it is more frequent that just one rare animal type is kept, although almost half of the conservers keep more than two rare breeds.

Figure 17: Number of species of animals and rare animals kept



The consideration of the species of animal is not sufficient. The races level is more important for most species of animals: it reflects the diversity or rather here the extent of the conservation activity within one species of animal. This analysis is only for the areas conservation of rare animals (Figure 18). Frequently more than one species is kept. In particular in cattle, sheep and chickens, an average of more than two types are kept. The median is 1 throughout, meaning that always at least half of the keepers keep just one rare breed of one species. This result is clearly different from that for rare plants, in which in the median as well as on average, five and more rare varieties are planted. Apparently the keeping of animals is linked to so much more work than the plants, that people keeping a multiplicity of rare breeds tend to be overwhelmed.

Figure 18: Average and median numbers of races of rare animal

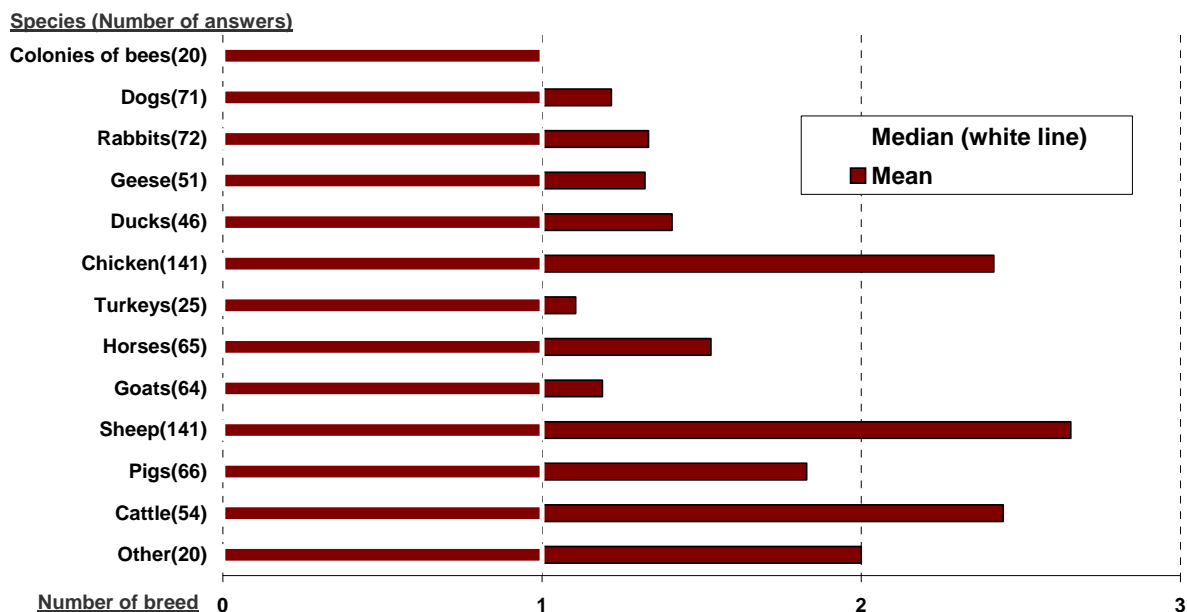


Table 9: Pair combinations in the keeping of farm animals

	Cattle	Pigs	Sheep	Goats	Horses	Turkeys	Chicken	Ducks	Geese	Rabbits	Dogs	Colonies of bees	Other
Cattle	73												
Pigs	34	83											
Sheep	30	50	162										
Goats	24	37	50	88									
Horses	34	42	43	41	95								
Turkeys	12	23	20	18	19	37							
Chicken	44	66	89	63	64	36	182						
Ducks	14	34	39	36	28	29	71	76					
Geese	19	36	43	39	32	27	63	45	70				
Rabbits	14	39	48	43	34	23	69	40	39	104			
Dogs	26	44	70	50	49	21	78	42	41	47	120		
Colonies of bees	11	14	20	10	13	6	21	9	9	12	12	37	
Other	11	20	28	22	21	6	38	21	16	22	30	6	73

Number of persons who keep animals of the according species
 if within a paired combination more than 75 % of one side use this combination
 if within a paired combination more than 50 % of one side use this combination

In the keeping of rare animals, as well as in the case of cultivated plants, a concentration focuses on few types (Tables 9 and 10). One reason could be that the conservation activity means not just husbandry but also breeding, which causes more work. Furthermore combinations of poultry are particularly evident, also combinations of sheep with other species of rare farm animals.

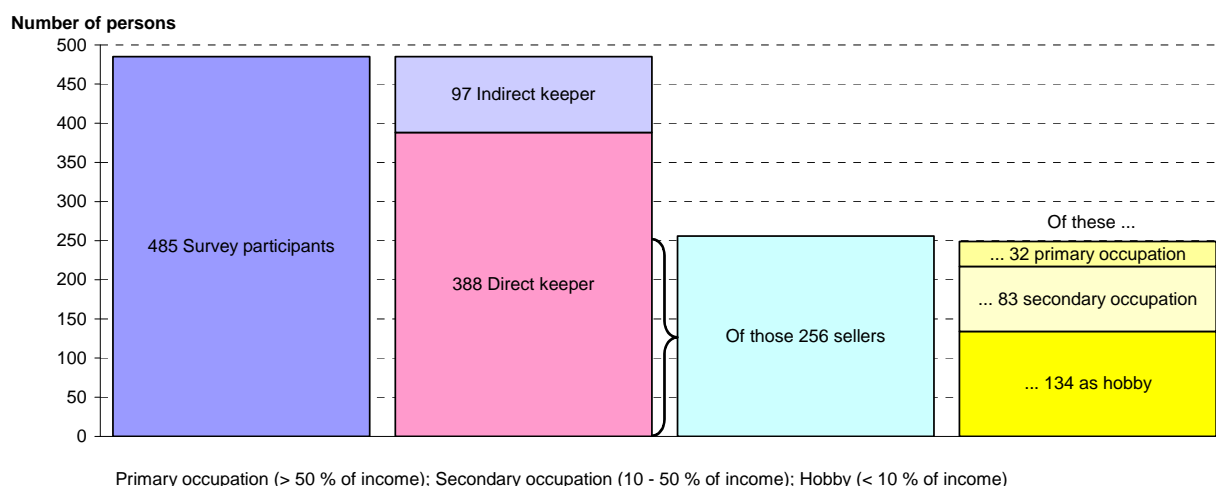
Table 10: Pair combinations in the keeping of rare cultivated animals

	Cattle	Pigs	Sheep	Goats	Horses	Turkeys	Chicken	Ducks	Geese	Rabbits	Dogs	Colonies of bees	Other
Cattle	54												
Pigs	22	66											
Sheep	20	38	141										
Goats	11	21	33	64									
Horses	18	20	27	22	65								
Turkeys	4	16	14	12	9	25							
Chicken	27	40	69	41	40	22	141						
Ducks	4	16	25	21	16	14	38	46					
Geese	13	21	29	22	17	15	37	26	51				
Rabbits	6	25	38	28	21	12	40	21	23	72			
Dogs	10	20	39	24	25	8	42	18	17	26	71		
Colonies of bees	4	7	11	4	6	2	10	4	5	5	4	20	
Other	2	4	8	6	5	1	8	6	5	6	8		20

Number of persons who keep animals of the according species
 if within a paired combination more than 75 % of one side use this combination
 if within a paired combination more than 50 % of one side use this combination

3.4 Conservation activities and marketing

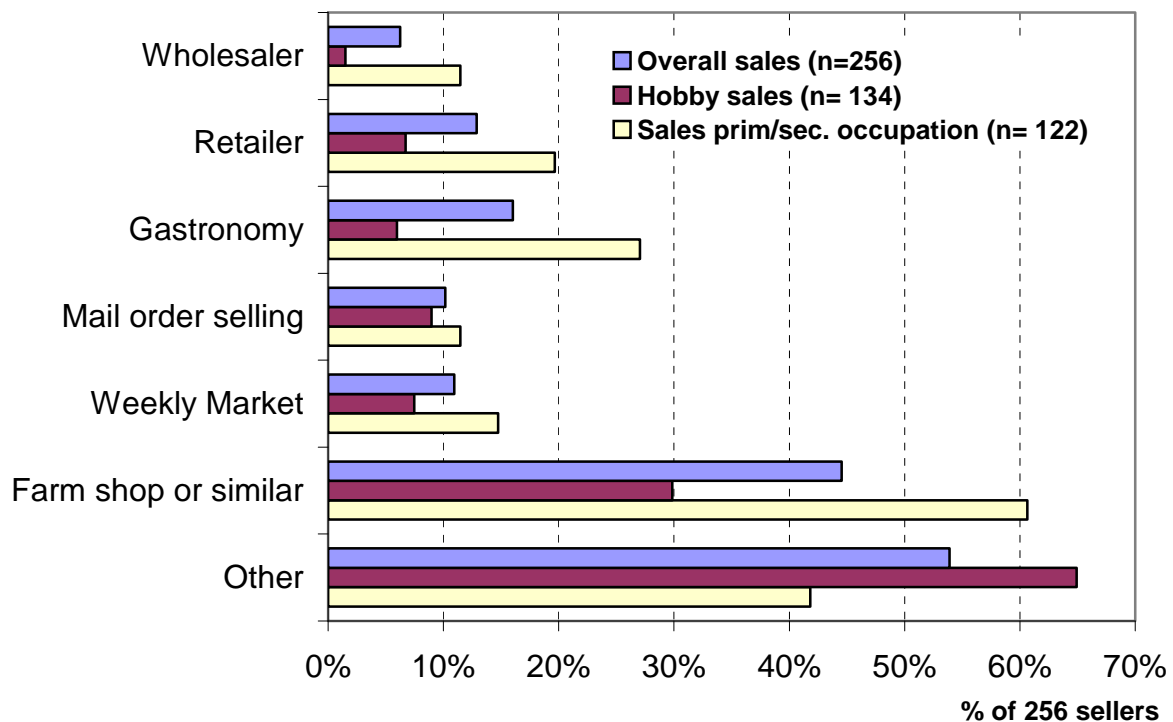
Of the 388 persons who actively keep cultivated plants or animals, 256 persons market the products from their activities with plants, animals or products (Figure 19). For 54 % of the marketers this activity is a hobby, 33 % attain a significant part of their income from the activities, and for 13 % it is the main source of income. In answer to the question of the economic significance of marketing in the past 2 to 3 years (247 respondents of 256) 65 % could increase the proceeds, 28% remained the same, and 7 % dropped.

Figure 19: Percentage of Marketers and Significance of Marketing

The most important sales route is marketing via farm stores or similar outlets (Figure 20). Under this rubric also fall the majority of answers ordered under “Other” (“direct sales,” “private sales,” “sales to neighbours”). In addition, cooperation with trade partners and other marketing forms play a less important role. But the sellers, for whom this is more of a hobby, sell much more frequently to gastronomy, retailers and wholesalers.

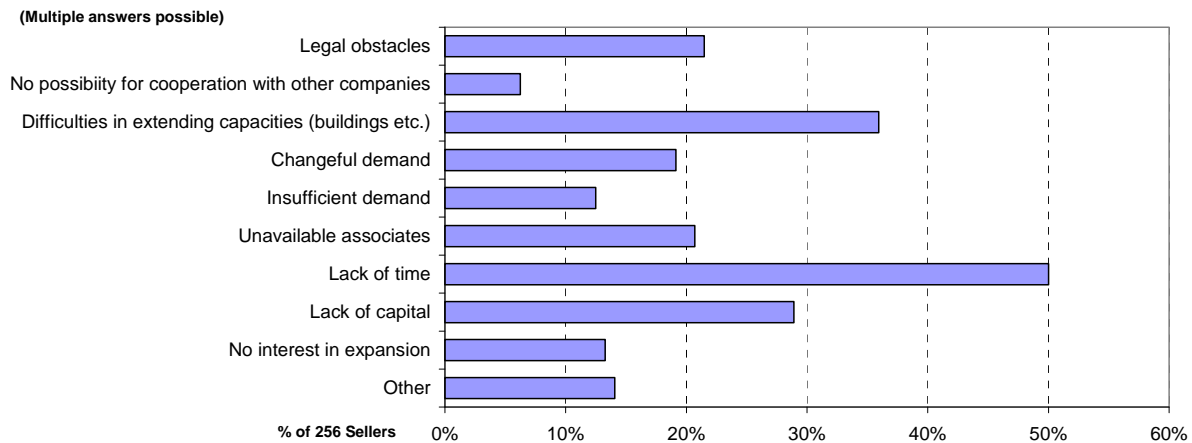
Figure 20: Sales routes in sale of products from conservational activities

(Multiple answers possible)



Only a scant 15 % of those who marketed their wares had no interest in increasing their marketing (Figure 21). Mostly limited resources (time, capital, equipment, land) were obstacles to expansion. Legal obstacles were also of importance, as were a lack of co-workers: In contrast, inadequate demand was seldom a problem, but rather fluctuation in demand.

Figure 21: Obstacles to an expansion of the marketing of products from conservational activities



3.5 Competencies and Deficits in the Conservational Activities

Also asked were the areas in which the survey participants possess adequate abilities or in which they desire support. Both questions were evaluated for all participants as well as those in the groups of direct and indirect conservers of rare plants or animals and sellers (Figures 22 and 23). Adequate abilities existed, as expected, above all in the direct conservational activities breeding, husbandry and growing of rare animals. In contrast, the results for rare cultivated plants were surprising: only $\frac{1}{4}$ of the active conservers had adequate competence in the breeding conservation of rare plants according to their own information. Here a significant deficit became apparent, since this ability is the core of the On Farm Management. Particularly conspicuous is also the overall low level of available competencies, which only exceeded the 50 % level in a few cases. Interesting are especially the relatively low quotas of available competencies in the areas important for the sale of products (sales, marketing, production of products and making connections).

According to the preceding results, support in the areas relevant for sales seem to be desirable as well as in questions of financing and procuring subsidies (Figure 23). It is conspicuous that particularly persons who already have had experience in sales desire further support in areas relevant to marketing.

Figure 22: Areas in which adequate competencies are available

(presented in percent of the appropriate answers for the entirety of each group)

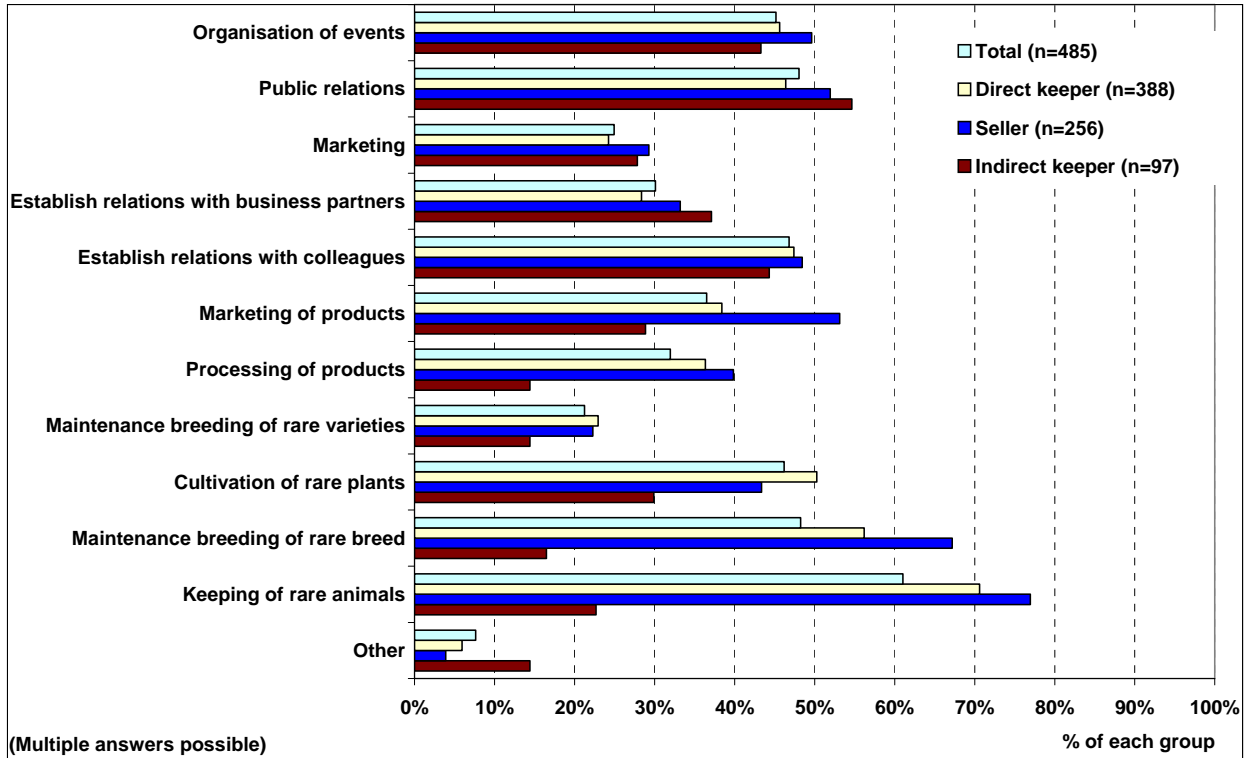
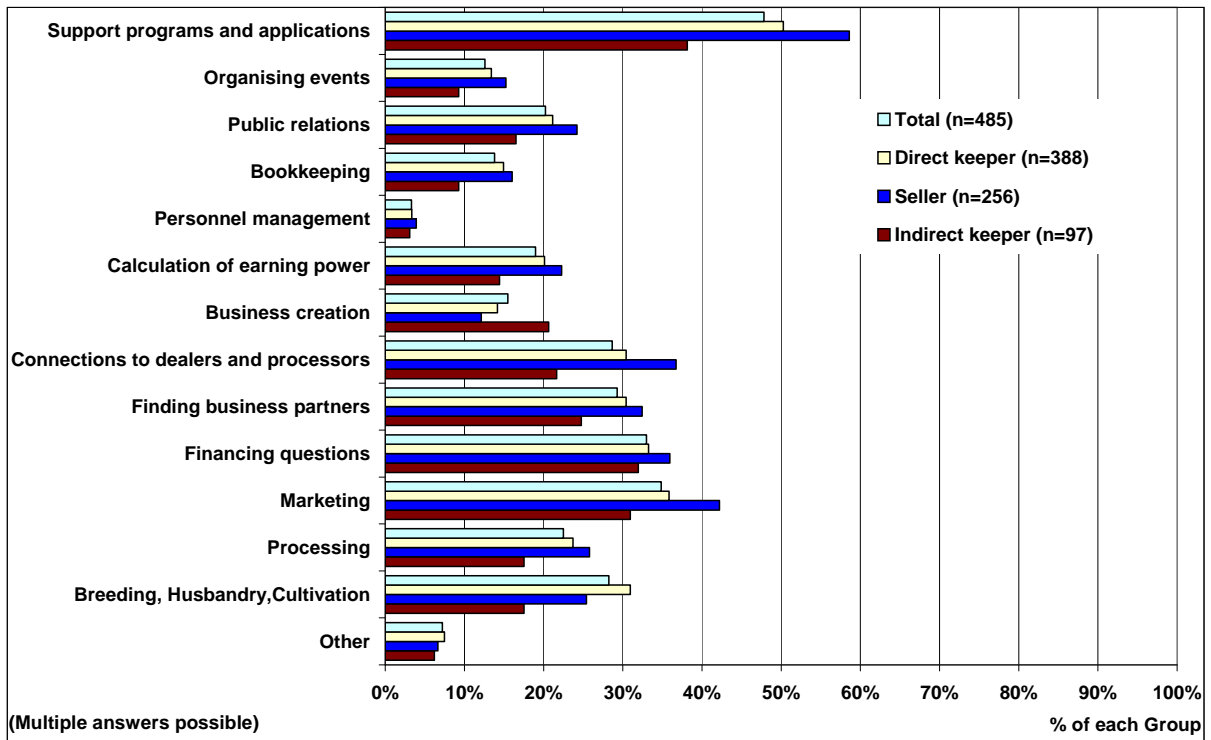


Figure 23: Areas in which support is desired

(presented in percent of the appropriate answers for the entirety of each group)



4 Summary and Conclusions

In Germany there is a long tradition of scientifically based plant and livestock breeding. Plant breeding is done almost completely in specialised breeding companies while breeding of cattle, horses and partially pigs still is in the hands of specialised farms. Nevertheless commercial breeding dominates the supply of seed and breeding animal for farmers. Moreover commercial breeding is focused on few agricultural species as well as varieties and breeds. Diversity and maintenance of rare species, varieties and breeds (land races, e.g.) isn't a prominent objective of commercial breeding. As a result the diversity of plant species and the diversity of used livestock decreased over the last decades.

Additionally there is no scarcity of diversity obvious for consumers and society because in supermarkets a huge diversity of products is offered due to processing of few agricultural raw materials into diverse products and imports of exotic food from all over the world.

Thus engagement in maintaining agro biodiversity needs a detailed understanding of the context, meaning of the on site endangerment of agricultural biodiversity. That is the case only for a small group of society. These people support On Farm Management or are engaged directly in On Farm Management. The On Farm Management of rare plants and animals, meaning the conservation of rare cultivated plants and animals through planting and husbandry is primarily undertaken by private persons either themselves or in associations, initiatives etc. No overview exists to date about these activities in Germany and the extent of the conservation activities conducted. With the online survey presented here, a first attempt to identify and characterise these groups is undertaken. Overall an estimated 4000 persons or households were contacted directly via E-Mail newsletters and an undetermined number via links on the homepages of involved associations and organizations on the survey pages. A total of 1261 persons clicked on the survey, and 485 fully completed surveys could be analysed. To what extent the sample addressed by the survey is representative remains unclear because the survey was targeted over selected organizations and through the online survey a distortion is given due to the Internet use.

In addition to results on direct conservational activities, detailed information on the perspectives of those surveyed were won. The survey participants are about 60 percent male and 40 percent female. The main age group was between 30 and 60 years of age. They have an above average educational level, and 60 % of those surveyed were tied profes-

sionally to agriculture in some way, meaning that 40 % of the participants work in conservation without direct professional interest. A total of 80 % of those surveyed directly conserve rare cultivated plants or animals, thus, 20 % are interested and engaged in the theme only. In addition to the direct maintenance activities, participation in related associations, clubs, etc. as well as public relations activity play a role. Nonetheless, a good fifth of the participants are not attached to any association. The activity for this topic is, with 13 hours/week, classified as very high.

With regard to the opinions, the groups of persons involved showed a significant preference for organic farming and a critical opinion of conventional plant breeding and government regulations. The promotion of the conservation of genetic resources should be clearly expanded according to the opinion of those surveyed.

The option of use, consumption or marketing for conservation was judged strongly positive, as was the overall opinion of marketing and entrepreneurship. Less clear, but nonetheless positive, was the economic potential of marketing of products from the maintenance activities as well as the own steps into self employment.

The cropping and conservation of rare cultivated plants and animals is characterized by diversity. This holds true both for the diversity of the total number of types, varieties and breeds kept as well as for the rare plants or animals held by individuals or households. Differences exist particularly in the maintenance of rare plants in the breadth of the conservation: There few people maintain a high number of varieties on a far above average large amount of land. In the conservation of rare breeds, this is not as clear. In sum, around about 100 hectares are cultivated with rare plants and 16 000 rare animals are kept; the majority of these larger animals (cattle, swine, sheep and goat).

Marketing is part of their activity for 256 of 388 active conservers, while particularly animal husbandry is tied to marketing activities. Direct marketing is dominant. Persons who target a large portion of their income from conservational activities also use more gastronomy, retailers and wholesalers as a marketing path. In particular the scarce resources time, capital, building and other capacities as well as a lack of partners stand in the way of an expansion of commercialisation, while demand problems are hardly offered as a reason.

The own abilities in the different areas of On Farm Management were seen by only about 50 % of those surveyed as adequate. Primarily in the marketing relevant areas is a lack of abilities seen, and here, accordingly, support is desired. But also by the indirect breeding conservation (especially with plants) many feel they lack adequate ability.

Together with the direct information won from the questionnaire, supplementary aspects came from discussions with representatives from organizations and individuals that present a starting point for further studies and accordingly present unsolved task areas.

In the following an attempt was made to sketch these topics in part in the form of questions.

1. As the study on “Communication on Agro-Biodiversity” also established, and the survey on the high percentage of persons who are not involved in an association or initiative, etc., it can be seen that the maintenance of rare animals and plants is not marked by a high level of organization. Moreover, this topic strongly lacks an umbrella organisation that could publicly represent the interests of the non governmental organizations effectively and represent them officially to policy makers. It appears sensible to intensify the discussion on this topic in the organizations. In addition, the current division between plants and animals could be addressed.
2. If one compares the efforts made by the government and research facilities to protect actually threatened rare species and varieties with the certainly just as great efforts being undertaken by private persons to conserve them, the few points of contact between the two are very evident. Thus chances remain unused and problems most likely unnecessarily not solved.
 - a. thus private conservers might make important contribution to conservation which research agencies or gene banks are not in a position to master, although they consider them important (i.e., increased planting of gene bank samples to evaluate the samples, testing of current market ability of neglected or threatened types, varieties and breeds).
 - b. While research agencies have ideas about the endangerment of breeds and varieties in a region, it is not at all clear whether these are in accord with the wishes of the private conservers. It could be possible that someone plants a variety which is in his/her opinion threatened, although this does not measure up to scientific standards. Thus, there is much need for intensive cooperation between public sci-

- entific agencies and private persons or initiatives. Here discussion, communication and coordination needs emerge.
3. The On Farm Conservation assumes maintenance breeding activities. But, which breeding goals are relevant by the maintenance of individual varieties and species. A provocative example is the conservation of races of “triple-use cattle” (milk, meat, force). Should the force, e.g., to pull a plough be part of the conservational breeding? Does it make sense to set a framework containing general or precise breeding goals. This seems at least in the case of private conservers not to be the case in all areas (species, varieties). In addition is the fact that conservers only partially see their own abilities in breeding conservation techniques as adequate a significant point for improvement. Here schooling and seminar opportunities are urgently needed.
 4. The development of sustainable production structures as well as the successful marketing of products are key factors for sustainable success and thus the long-term existence of many breeding and maintenance initiatives (Becker et al., 2003; Clausen et al., 2004; Spiller et al., 2004). But also in general there is the problem that rare agricultural plants and livestock breeds are ‘products’ that got lost somewhere in the race of trying to attract the consumer's favour due to different reasons. But sustainable maintenance needs the consumer and the market if it shouldn't be limited to a somewhat museum-like treatment. Should the conservation activity make the leap onto the market, meaning it achieves economic sustainability, then in addition to the breeding, agricultural and horticultural competences needed, additional economic or rather business abilities and knowledge are required. Such knowledge is often lacking, as the survey confirms. They must either be painstakingly found or “purchased” through consultation. (Bremond et al, 2004). The easier way, to hire experienced staff, is generally not financially possible for such initiative. In the marketing of the products from rare breeds there are similar problems as in the dealing with traditional, farm and regional varieties. A) Sufficient amounts of interest for food retailing cannot be produced. B) The production is expensive due to less performing varieties, races. C) For most plant and animal species, consumers and dealers are not accustomed to choosing between different varieties or races. Accordingly marketing and sales of such products have special requirements and must follow an own path. That such paths exist is seen in successful projects. The view on the successful cases allows one to assume that entrepreneurial ability is a significant factor for success.

That is why this aspect must be attributed just as much weight in the support of conservation, above all because the survey shows significant deficits here.

5. Last but not least the discussions about the complexity of this theme show, that public understanding needs to be evolved through all the instruments available to inform the general public.

References

- AGOF, Arbeitsgemeinschaft Online-Forschung e. V. (2008) internet facts 2007-IV. Internetseite Frankfurt <http://www.agof.de/studie.353.html>, zitiert am 12.6.2008
- BARTH R, BILZ M, BRAUNER R, CLAUSEN J, DROSS M, HEINEKE C, IDEL A, ISELE J, KOHLSCHÜTTER N, MATHES M, MEYER A, PETSCHOW U, WALTER S, VÖGEL R, WISSEN M, WOLFF F, WUNDERLICH U (2004a) Kapitel 10 : Fallstudie Rind. In: IÖW, Institut für ökologische Wirtschaftsforschung, Öko-Institut e.V., Schweisfurth-Stiftung, Freie Universität Berlin, and Landesanstalt für Großschutzgebiete: Agrobiodiversität entwickeln! Handlungsstrategien für eine nachhaltige Tier- und Pflanzenzucht. Endbericht. Berlin. S. 1-73
- BARTH R, BILZ M, BRAUNER R, CLAUSEN J, DROSS M, HEINEKE C, IDEL A, ISELE J, KOHLSCHÜTTER N, MATHES M, MEYER A, PETSCHOW U, WALTER S, VÖGEL R, WISSEN M, WOLFF F, WUNDERLICH U (2004b) Kapitel 8: Fallstudie Huhn. In: IÖW, Institut für ökologische Wirtschaftsforschung, Öko-Institut e.V., Schweisfurth-Stiftung, Freie Universität Berlin, and Landesanstalt für Großschutzgebiete: Agrobiodiversität entwickeln! Handlungsstrategien für eine nachhaltige Tier- und Pflanzenzucht. Endbericht. Berlin. S. 1-75
- BARTH R, BILZ M, BRAUNER R, CLAUSEN J, DROSS M, HEINEKE C, IDEL A, ISELE J, KOHLSCHÜTTER N, MATHES M, MEYER A, PETSCHOW U, WALTER S, VÖGEL R, WISSEN M, WOLFF F, WUNDERLICH U (2004c) Kapitel 9 : Fallstudie Schwein. In: IÖW, Institut für ökologische Wirtschaftsforschung, Öko-Institut e.V., Schweisfurth-Stiftung, Freie Universität Berlin, and Landesanstalt für Großschutzgebiete: Agrobiodiversität entwickeln! Handlungsstrategien für eine nachhaltige Tier- und Pflanzenzucht. Endbericht. Berlin. S. 1-64
- BDP, BUNDESVERBAND DEUTSCHER PFLANZENZÜCHTER (1987) Landwirtschaftliche Pflanzenzüchtung in Deutschland : Geschichte, Gegenwart und Ausblick. Mann, Gelsenkirchen-Buer
- BECKER HC, BERGMANN H, JANTSCH P, MARGGRAF R (2003) Darstellung und Analyse von Konzepten des On-farm-Managements pflanzengenetischer Ressourcen unter besonderer Berücksichtigung der ökonomischen Rahmenbedingungen in Deutschland, Studie für das Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft. Staatliche Universitätsbibliothek, Göttingen
- BIOFRANKFURT KOMPETENZZENTRUM BIODIVERSITÄT FRANKFURT (2007) Biozahl 2007. <http://www.biofrankfurt.de/3.html>, zitiert am 4.10.2007
- BMELV, BUNDESMINISTERIUM FÜR ERNÄHRUNG LANDWIRTSCHAFT UND VERBRAUCHERSCHUTZ (2007): Biologische Vielfalt. http://www.bmelv.de/cln_044/nn_751688/DE/09-BiologischeVielfalt/_BiologischeVielfalt_node.html_nnn=true, zitiert am 5.10.2007
- BREMOND J and Vortrag im Workshop „Bäuerliche Erhaltungsinitiativen zwischen Idealismus und Überforderung“. Im Rahmen der Tagung „Agrobiodiversität entwickeln“ am 3. und 4.2.2004 in Berlin. (3-4-2004) : Vortrag

- CLAUSEN J, WALTER S (2004) Marktsituation und Anreizstrukturen für Produkte aus seltenen Nutzpflanzen oder Nutztierassen. In: IÖW, Öko-Institut Schweisfurth-Stiftung FU-Berlin LAGS: Agrobiodiversität entwickeln! Handlungsstrategien für eine nachhaltige Tier- und Pflanzenzucht. Berlin
- DANNENBERG M, BARTHEL S (2002) Effiziente Marktforschung. Bonn, Galileo Press
- DESTATIS, STATISTISCHES BUNDESAMT und HAHLEN J (2007) Pressekonferenz „Leben und Arbeiten in Deutschland – Ergebnisse des Mikrozensus 2004!“
http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Presse/pk/2004/Mikrozensus/Statement__Hahlen,templateId=renderPrint.psml
zitiert am 17.6.2008
- DGfZ, ARBEITSAUSSCHUSS ZUR ERHALTUNG DER GENETISCHEN VIELFALT BEI LANDWIRTSCHAFTLICHEN NUTZTIEREN DER DEUTSCHEN GESELLSCHAFT FÜR ZÜCHTUNGSKUNDE E. V. DGfZ (2003) Nationaler Bericht Deutschlands als Beitrag zum Bericht der FAO über den Zustand tiergenetischer Ressourcen der Welt (FAO-Report on the State of the World's Animal Genetic Resources) mit einem Nationalen Fachprogramm zur Erhaltung und nachhaltigen Nutzung tiergenetischer Ressourcen in Deutschland.
http://www.genres.de/tgr/nationales_fachprogramm/. zitiert am 30.6.2008
- EFKEN J (1998) Der Getreidesaatgutmarkt in Deutschland. Dissertation (Hohenheim)
- EFKEN J (2005) On-farm-Management in Deutschland - Funktion, Gestaltung und Strategie. In: Efken, J. (Hrsg.): Vermarktungsstrategien für innovative Produkte und Verfahren auf der Basis genetischer Ressourcen für Ernährung und Landwirtschaft. Schriften zu Genetischen Ressourcen, H. 17. Bonn, S. 1-12
- FELDMANN A (2002) Alte und gefährdete Haustierrassen bieten Chancen in der Vermarktung. In: Informations- und Koordinationszentrum für Biologische Vielfalt (IBV) der ZADI (Hrsg.): Vielfalt auf den Markt. Schriften zu Genetischen Ressourcen, H. 17. Bonn, S. 129-137
- FRANKEL O, BENNETT E (1970) Genetic Resources in Plants - Their Exploration and Conservation. Oxford
- HAMMER K (1999) Agrarbiodiversität und pflanzengenetische Ressourcen - Herausforderung und Lösungsansatz. Bonn
- IBISCH P, BARTHLOTT W, LOBIN W (1996) Botanische Gärten und In-situ-Erhaltung pflanzengenetischer Diversität: ein Widerspruch? In: Informations- und Koordinationszentrum für Biologische Vielfalt (IBV) der ZADI (Hrsg.): In-situ-Erhaltung pflanzengenetischer Ressourcen in der Bundesrepublik Deutschland am natürlichen Standort und on farm. Schriften zu Genetischen Ressourcen, H. 2. Bonn, S. 177-199
- IUCN, INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES UND IUCN, COUNCIL (2001) IUCN Red List, Categories and Criteria, Version 3.1.
http://www.iucnredlist.org/info/categories_criteria, zitiert am 5.6.2008
- KLEINHÜCKELKOTTEN S, WIPPERMANN C, BEHRENDT D, FIEDRICH G, SCHÜRZER DE MAGALHAES I, KLÄR K, WIPPERMANN K (2006) Kommunikation zur Agrobiodiversität: Voraussetzungen für und Anforderungen an eine integrierte

- Kommunikationsstrategie zu biologischer Vielfalt und genetischen Ressourcen in der Land-, Forst-, Fischerei- und Ernährungswirtschaft (einschließlich Gartenbau).
[http://www.bmelv.de/cln_044/nn_754188/DE/09-Biologische Vielfalt/_BiologischeVielfalt_node.html_nnn=true](http://www.bmelv.de/cln_044/nn_754188/DE/09-BiologischeVielfalt/_BiologischeVielfalt_node.html_nnn=true). zitiert am 5.10.2007.
- MOONEY PR (1983) The Law of the Seed: Another Development and Plant Genetic Resources
- PERSPEKTIVE DEUTSCHLAND (2006) Deutsche plädieren für soziale Leistungsgesellschaft.
<http://www.perspektive-deutschland.de/> zitiert am 17.6.2008
- SCHERTLER H (2004) Entscheidungsstrategien zur Planung von Erhaltungsmaßnahmen bei Nutztierassen. In: Informations- und Koordinationszentrum für Biologische Vielfalt (IBV) der ZADI (Hrsg.): Analyse und Bewertung der genetischen Vielfalt in der Land-, Forst- und Fischereiwirtschaft zur Ableitung von Entscheidungskriterien für Erhaltungsmaßnahmen. Schriften zu Genetischen Ressourcen, H. 24. Bonn, S. 91-97
- SPILLER A, SCHULZE B, ZÜHLSDORF A, STAACK T (2004) Gefährdete Tierrassen und Pflanzensorten: Vermarktung außerhalb der Marktnische. Expertise für das Institut für Ökologische Wirtschaftsforschung
- SPRENGER U, RIEWENHERM S, MINISTERIUM FÜR LANDWIRTSCHAFT, UMWELTSCHUTZ UND RAUMORDNUNG BRANDENBURG (2003) Von Salbei und Wruken. Potsdam
- STATISTISCHES BUNDESAMT (2006) Leben in Deutschland, Haushalt, Familien und Gesundheit - Ergebnisse des Mikrozensus 2005. Wiesbaden
- VIRCHOW D (1999) Conservation of Genetic Resources. Bonn
- WBGU, WISSENSCHAFTLICHER BEIRAT DER BUNDESREGIERUNG GLOBALE UMWELTVERÄNDERUNGEN (2000) Welt im Wandel: Erhaltung und nachhaltige Nutzung der Biosphäre. Springer, Berlin
- WERKMEISTER F (1996) Erhaltung gefährdeter Nutztierassen aus der Sicht der Länder. In: Informations- und Koordinationszentrum für Biologische Vielfalt (IBV) der ZADI (Hrsg.): Vergleichende Aspekte der Nutzung und Erhaltung pflanzen- und tiergenetischer Ressourcen. Schriften zu Genetischen Ressourcen, H. 5. Bonn, S. 48-59

Organisations

Dreschflegel; Ahornweg 6; 34399; Oberweser-Arenborn; www.dreschflegel-saatgut.de

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Kulturpflanzen-Kompetenzzentrum NRW (Landwirtschaftskammer NW)

- Safeguard for Agricultural Varieties in Europe SAVE Foundation Head Office ; Paradiesstraße 13; 78462; Konstanz; www.save-foundation.net/deutsch/save.htm
- Verein zur Erhaltung der Nutzpflanzenvielfalt VEN e. V.; Sandbachstraße 5; 38162; Schandelah; www.nutzpflanzenvielfalt.de
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- Zentrum für Umfragen, Methoden und Analysen (ZUMA), das frühere ZUMA in Mannheim ist jetzt Abteilung des neu gegründeten Instituts GESIS (Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen e. V.). Die Abteilung berät die Sozialforschung bei der Anlage, Durchführung und Auswertung sozialwissenschaftlicher Untersuchungen. <http://www.gesis.org/zuma/>
- Globalpark GmbH; Online-Befragungssoftware; Kalscheurener Straße 19a; 50354 Köln-Hürth; <http://www.globalpark.de/>; bzw. Online-Befragungssoftware für Hochschulen, Universitäten und Forschungseinrichtungen; <http://www.unipark.info/1-0-home.htm>