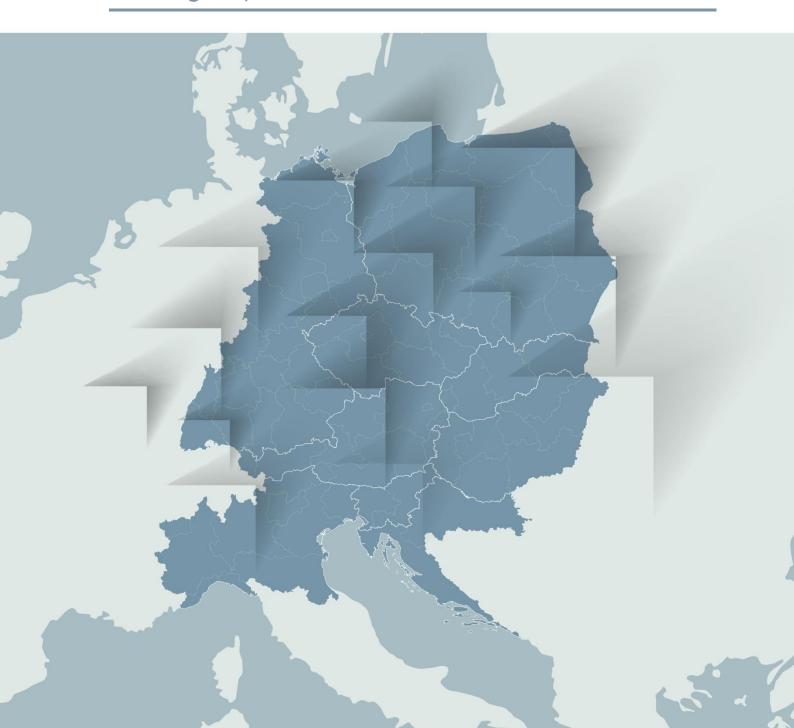


REPORT II TRANSFARM SURVEY ON CE FARMERS

2019 - COMBINED RESULTS IN TOTAL

D.T1.3.1 - HBLFA Francisco Josephinum Streimelweger R., Kehrer, M., Karner J., Rechberger C.;

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A. Introduction

This report is about the combined survey results for all 5 CE countries IT, AT, HU, SLO, and PL (=in total) on CE farmers requirements in technological innovation and is based on the results of the previous survey results in general from D.T1.3.1: "Report I Transfarm Survey on CE farmers 2019 - Results in general".

1. Linking general survey data with questions

In addition, the evaluation of the individual questions 1 to 12 were also combined to the four central general information of Part I (categories):

- Age (in years)
- Education/Training
- Farm size
- Main farm focus

2. Please note for Interpretation of the "COMBINED RESULTS"

Important note for the interpretation of the results in comparison: When interpreting the results, it is important to consider whether the explanation of the results focuses on the <u>respective category or</u> on the <u>farmers' response options</u>.

2.1. Focus on the respective category (e.g. AGE):

The percentages in the bars of the graphs describe for **each category** (y-axis of the **graph**) the percentages per response option (legend x-axis of the graph) in relation to the total number of responses (n=). The focus of the representation of the bars is thereby on the respective category/option (y-axis of the graphic). Since the population of each category consists of a different number of farmers' answers





(number=n), it is not easy to compare the individual categories (size % of the bars), since the comparison is based on "relative" majorities. Therefore, a statement can only be made within each individual category (e.g. age: 20-29, 40-49 or education: Matura, university degree) based on the percentages.

2.2. Focus on the respective answer option ("overall considered"):

As soon as a comparison with further categories with focus on the respective answer option (legend x-axis) is made, the respective population of this answer option is to be taken into consideration and the result interpretation of this answer option is to be designated with for example "overall considered" with regard to this one answer option X (= most frequently applied in terms of number). With regard to the result related to the farmers' answer options, the comparison of the categories (="overall considered") should be based on the shares within this answer option.

A statement **without** "overall considered" with respect to the answer **option** X therefore should always refer only to the respective category and its number/proportion (n=) of answers without comparison to other categories.

2.3. Examples for Interpretation of "COMBINED RESULTS"

2.3.1. Example 1 - Focus on category (age) using Figure 1

17 % of the 50-59 year olds are not interested in PF and (in this case!), also represent the largest group 17 % (n=54) in terms of the response option.

In contrast, 33 % of the 10-19 year-olds stated that they are not interested in PF, but in total they are the smallest group (next to the 70-79 year-olds, who also have n=3) with a total of three answers (n=3), although only one vote is allotted to this answer option.

With regard to the spelling of the overall result "largest group 17 % (n=54)", reference is made to the category percentages in the respective figure for easier finding. The result for the respective answer option "not interested in PF" converted into percentages would read in this case: In total, there were 25 answers (ngbA=25) to this answer option, with 9 votes coming from 50-59 year olds and thus the most frequent, followed by 5 votes each from 20-29 and 40-49 year olds. Therefore, the largest group with 36% (9 farmers of ngbA=25)





of those not interested in PF would be the 50-59 year olds, followed by 20% each (5 farmers of ngbA=25) of the 20-29 and 40-49 year olds. For the sake of simplicity, however, and so that conversion is not necessary, reference is made exclusively to the information available in the graph/figure, as the presentation does not change the statement that the 50-59 year olds are the largest group which is not interested in PF, regardless of whether the formulation/presentation "largest group represents 17 % (n=54)" or "largest group with 36 % (9 farmers of ngbA=25)" is used.

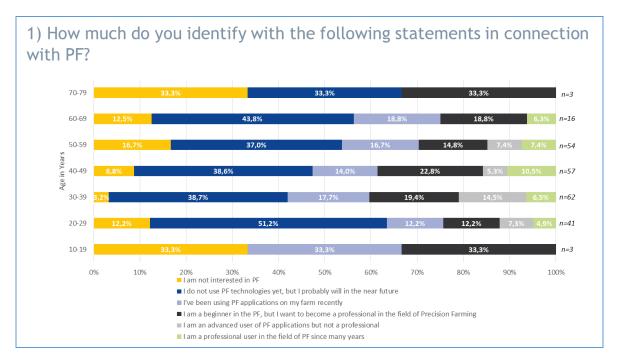


Figure 1: Question 1 & Age (in total = all countries)

2.3.2. Example 2 - Focus on response option 3 using Figure 1 ("overall considered")

If the focus is not placed on the category (e.g. age), but possibly **exclusively on the answer possibility**, the following example 2 can be used to illustrate what is implicitly said with Figure 1:

Overall considered, with regard to the answer option 3 "Precision Farming applications have recently been used on the farm", the largest group is the 30-39 year olds with 17.7 % (n=62). This implies that, in addition to the statement that this age group was the largest proportion (focus on one answer option), 17.7 % of the 30-39 year olds (focus category) agreed to this answer option.





A statement <u>without</u> "overall considered" with respect to the answer **option** X therefore should always refer only to the respective category and its number/proportion (n=) of answers without comparison to other categories.





B. COMBINED SURVEY RESULTS ON CE FARMERS REQUIREMENTS IN TECHNOLOGICAL INNOVATION

1. Introduction

1.1. General

Ten partners from 5 European countries (Italy, Poland, Hungary, Slovenia and Austria) started the Transfarm4.0 project in April 2019. During a period of three years the objective of Transfarm4.0 is to promote the uptake of precision agriculture in five respective Central European (CE) countries (IT, PL, HU, SLO and AT). The overall improvement of innovation value chains between technology providers and users should also be analysed.

The project intends to address the issue of technology transfer towards farming businesses in Central European regions. Therefore different degrees of technology intensity in their agricultural practices were characterised. For this purpose, six experimental pilot projects will be launched, focusing on ISOBUS applications, sensing technologies and the use of big data. The experimental activities will start in 2020.

As part of the Transfarm4.0¹ project a Precision Farming (PF) online survey among farmers was launched by Francisco Josephinum² Wieselburg (FJ) in 2019.

The Survey on CE farmers was launched online via online-survey-Link at end of July 2019. The online-survey was open for request from July 2019 until at least the end of November 2019 (4 month). The survey was created from FJ in Austria. Each project partner translated the survey afterwards in his own language and FJ created for each area (Italy, Poland, Hungary, Slovenia and Austria) an appropriate online-survey and a web-link for their farmers.

-

Website: https://www.interreg-central.eu/Content.Node/Transfarm4.0.html;

² Francisco Josephinum located in Lower Austria: Reinhard Streimelweger, Jürgen Karner, Christian Rechberger: FJ-BLT / Josephinum Research, Rottenhauser Street 1, 3250 Wieselburg, Tel.: +43 7416 52175 0; E-Mail: r.streimelweger(at)josephinum.at; juergen.karner(at)josephinum.at; christian.rechberger(at)josephinum.at;





The result of the survey comprises 236 responses from farmers in total of all five CE countries. All farmers answered sixteen questions regarding the topic of "Precision Farming". The aim of the PF survey was to collect and state the requirements and needs of farmers in the respective Central European countries (IT, PL, HU, SLO and AT) for possible future technological innovations.

Furthermore the results of the online survey provide inter alia an insight into the question, in which of the PF applications (e.g. Tracking systems (GPS), use of robots or drones, etc.) the farmers see a benefit or an opportunity, rather than a disadvantage or a risk, when applied for their farm. A SWOT analysis also was carried out for each of the five CE countries based on the online survey results.

In the first part of the survey, general information about the farmers and their farms was raised. This information was important to take into account social factors (esp. gender, age, education) as well as farm factors (esp. farm size, farm type, etc.).

This Precision Farming survey enabled new insights in the requirements and needs of famers in Central Europe and was evaluated in conjunction with CREA for Italy³, University of Maribor for Slovenia⁴, Szent István University for Hungary⁵ and KIRG for Poland⁶.

The following results shown in the figures are the combined results for all five countries in total. Therefore a certain drift in interpretation must be taken into account in the results.

³ CREA: Researcher *Diego Tomasi* and *Davide Boscaro*

⁴ University of Maribor: Peter Berk, Damijan Kelc, Miran Lakota, Jurij Rakun, Erik Rihter, Denis Stajnko, Peter Vindiš and AG-ROBO.net: Peter Lepej, Peter Polič.

⁵ Szent Istvan University (SZIU) - Researcher Prof. Dr. Borbala Balo, et.al and agroit: Veronika Eros, et.al.

⁶ KIRG: Pawel Materka et.al.





2. Combined Survey Results

In the following the results of the responses <u>in total for all five countries</u> is shown. This structure is for all figures as overview the same. In total we received 236 answers from farmers in CE. These 236 responses are broken down among countries as follows: Italy (40), Hungary (49), Slovenia (40), Poland (30) and Austria (77). For each closed question of the survey (1 to 11) the data are shown combined with each of the following four central general information of Part I (categories):

- Age (in years)
- Education/Training
- Farm size (agricultural land)
- Main farm focus





2.1. Question 1: How much do the farmer identify with the following statements in connection with PF?

2.1.1. Age

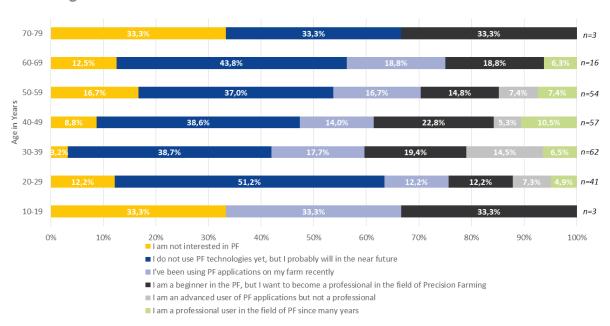


Figure 2: Survey results combined in total - Question 1 and Age

The analysis (Figure 2) focuses on the age groups from 20 to 69 years, as only three participants (n=3) each of the 10-19 and 70-79 year olds responded.

About 17 % of the 50-59 year olds are not interested in PF and therefore represent the largest group with 16.7 % (n=54).

In terms of age, the largest share per category received the answer option "I am not currently using PF technology, but plan to in the near future" with 33% to 51.2%. About half of the 20-29 year olds (51.2%) and currently do not use precision farming technologies, but plan to do so in the near future.

Recently, precision farming applications on the farm have been used on a similar scale (12-19%) by less than 20% of the 20-69 age group. Overall, in terms of this possible answer "recently precision farming applications have been used on the farm", the largest group are the 30-39 year olds with 17.7% (n=62).

The largest age group which are beginners but want to become professionals in the field of precision farming are also the 40-49 year olds with 22,8 % (n=57). Then come





the 30-39 year olds with 19.4 % (n=62). The largest share of advanced users of PF applications who are not yet professionals is also found in the age group of 30-39 years with 14.5 % (n=62).

Concerning the professionals since years it should be noted that the largest group with 10.5 % (n=57) is among the 40-49 year olds.

2.1.2. Education

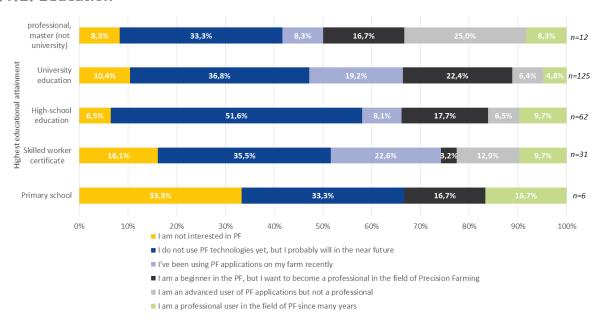


Figure 3: Survey results combined in total – Question 1 and Education

Most of the participants in the survey had a university degree with 53% (n=125), then came those with Matura with 26% (n=62) and then skilled workers 13% (n=31).

About half of the participants with Matura (51.6 %) do not currently use precision farming technologies, but plan to do so in the near future. This makes them by far the largest proportion of all categories in comparison, as only about a third (33.3 % - 36.8 %) of the other categories use precision farming technologies.

Recently, PF applications on the farm as a whole have been used mainly by those with a university degree with 19.2% (n=125). However, this category also includes the majority with 10.4% (n=125), who state that they have no interest in PF.

The largest group of farmers who want to become beginners but professionals in the field of precision farming are those with a university degree with 22 % (n=125).





The largest proportion of advanced users of PF applications, who are not yet professionals, in terms of the respective category, is found in the training group of others with a master craftsman's degree (25% of n=12), but this corresponds to only three farmers. Overall, however, the category of farmers with a university degree is the most common group in terms of numbers (6.4% of n=125) which is an advanced user of PF applications.

In total, most professionalists are to be found in the two categories with Matura (9.7 % of n=62) and University degree (4.8 % of n=125) with 35 % each (6 farmers out of ngbA=17) of farmers, which represents 70 % of all professionalists (ngbA=17) in the survey.

2.1.3. Farm size

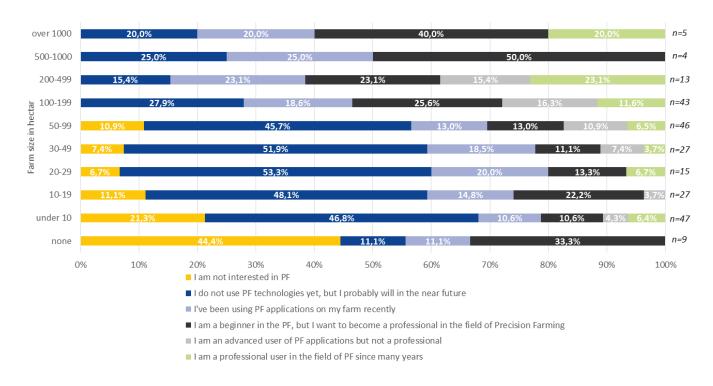


Figure 4: Survey results combined in total - Question 1 and Farm size





Most participants in the survey farmed an area of less than 10 ha with 20% (n=47) or 50-99 with 19.5% (n=46) or 100-199 ha with 18.2% (n=43). In the following the results are explained on the basis of Figure 4.

A clear difference can be seen between farms below and above 100 ha. From 100 ha onwards there is no farmer who is not interested in PF. About half of the farms (45.7 % to 53.3 %) from less than 10 ha to 99 ha do not currently use precision farming technologies, but plan to do so in the near future.

In total, farmers with farm sizes between 100-199 ha, who are beginners but want to become professionals in precision farming, have the largest share in this category in comparison, with a total of 26% (11 farmers of ngbA=43). Among the farms with less than 100 ha, the largest share is 14% for farms with 10-19 ha (6 farmers of ngbA=43) and 50-99 ha (6 farmers of ngbA=43) respectively.

Also among the advanced users in the PF and the professionals, the farm size between 100 to 199 ha has the largest share in the comparison, with 37% (16.3% of n= 43 and 7 farmers of ngbA=19 respectively) and 29% (5 farmers of ngbA=17).

2.1.4. Main farm focus

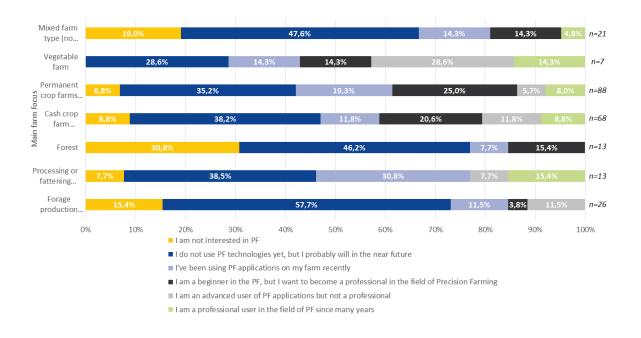


Figure 5: Survey results combined in total – Question 1 and Main farm focus





The two largest groups in terms of number of responses per farm class are permanent crop farms with 37% (n=88) and cash crop farms with 29% (n=68). (Figure 5, total (n) = all countries taken together)

The largest share, ranging from 28.6% to 57.7% per farm class (Figure 5), does not currently use precision farming technologies, but plans to do so in the near future. Especially the forage farms with 57.7% (n=26) intend to use PF technologies in the near future. Overall, the permanent crop farm class has the largest share (35.2% of n=88), followed by the cash crop farms.

The largest group of advanced PF users, 42% (8 farmers of ngbA=19), is found in the total for cash crop farms and 41% (7 farmers of ngbA=17) for professionalists in the permanent crop farms.

30.8 % of the participating forest farmers (n=13) show the highest share of non PF interested persons in comparison between the categories. The highest share of professionals per category is found among the processing farms with 15.4 % (n=13).





2.2. Question 2: How important are PF applications for the farmers daily practice on their farm?

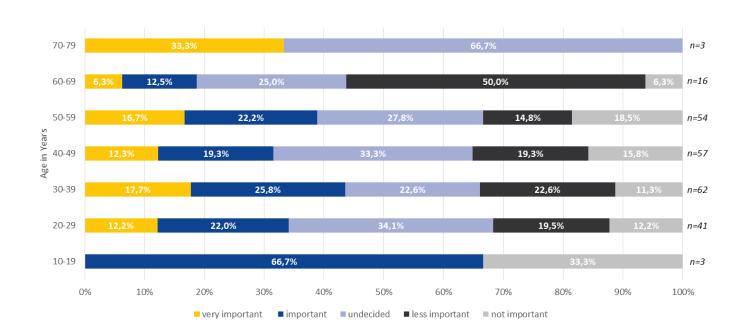


Figure 6: Survey results combined in total – Question 2 and Age

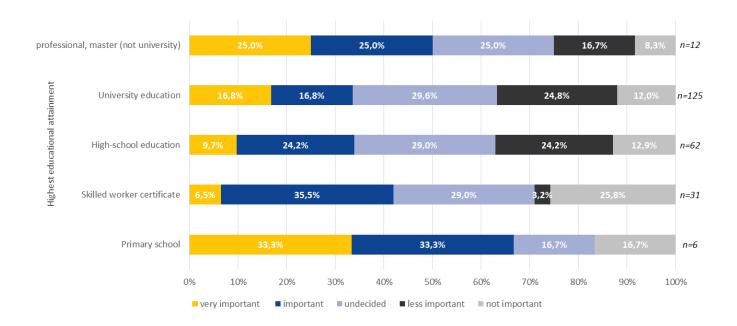


Figure 7: Survey results combined in total – Question 2 and Education



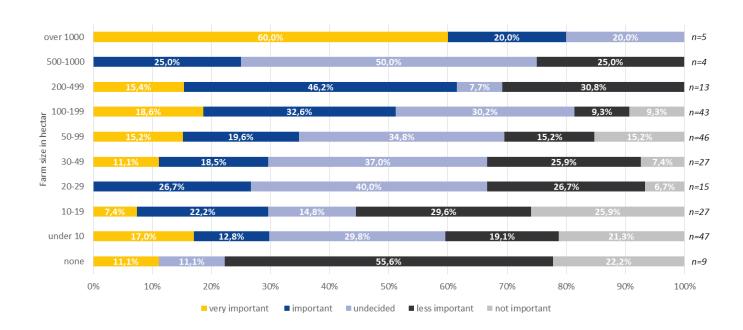


Figure 8: Survey results combined in total - Question 2 and Farm size

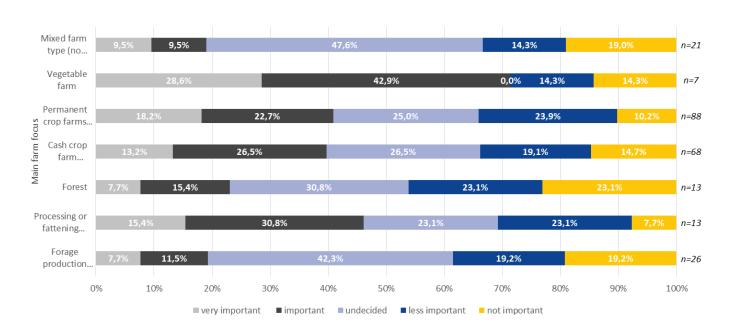


Figure 9: Survey results combined in total - Question 2 and Main farm focus





2.3. Question 3: Which statement(s) is (are) correct for you and your farm? "I would use (reinforced) PF technologies on my farm, if..."

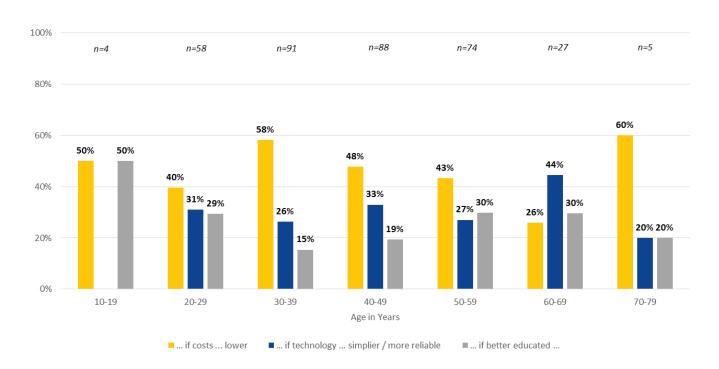


Figure 10: Survey results combined in total – Question 3 and Age

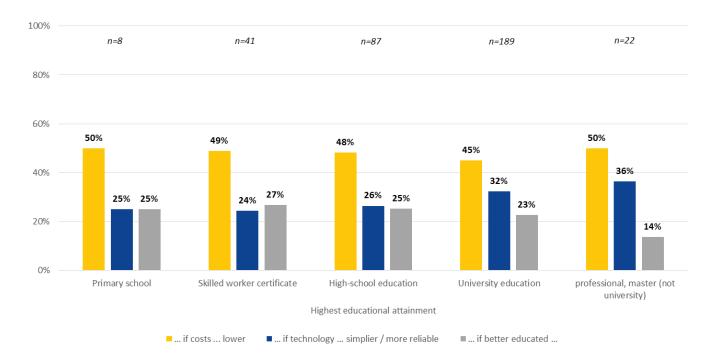


Figure 11: Survey results combined in total - Question 3 and Education



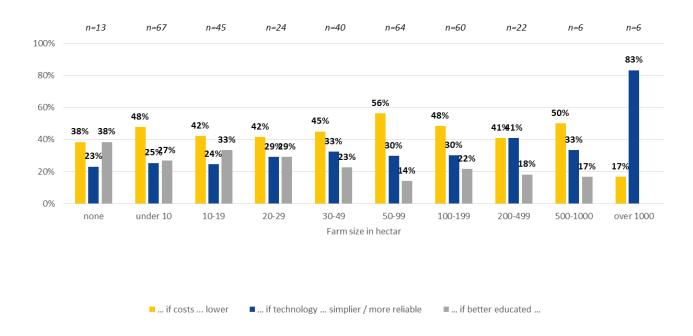


Figure 12: Survey results combined in total – Question 3 and Farm size

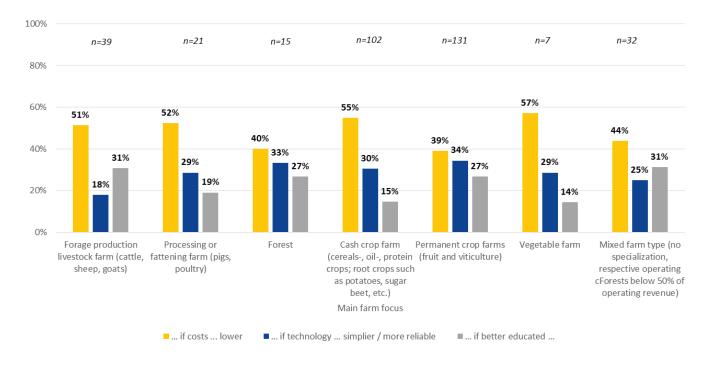


Figure 13: Survey results combined in total – Question 3 and Main farm focus





2.4. Question 4: What data would you consider most relevant for running your farm? (Check maximum 3 answers).

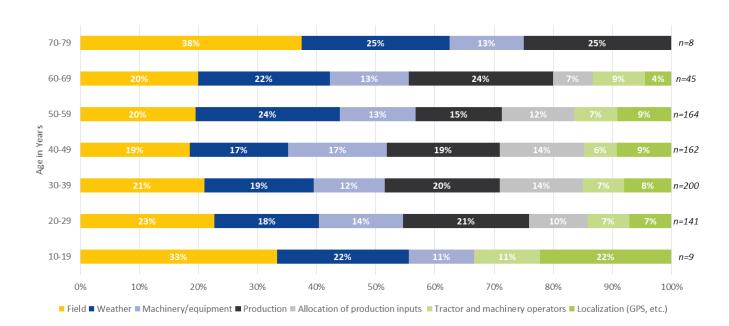


Figure 14: Survey results combined in total – Question 4 and Age

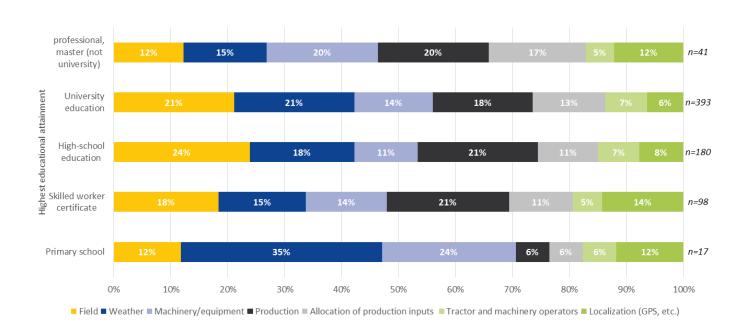


Figure 15: Survey results combined in total - Question 4 and Education



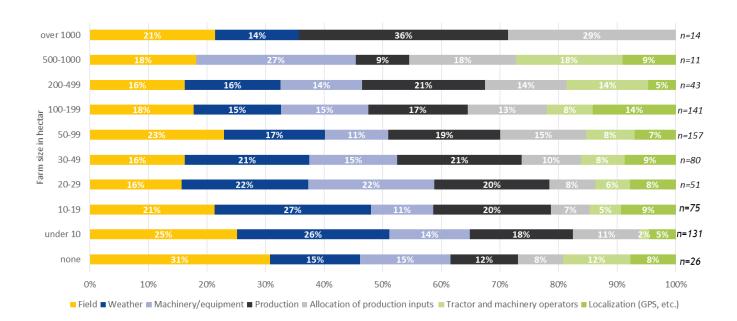


Figure 16: Survey results combined in total – Question 4 and Farm size

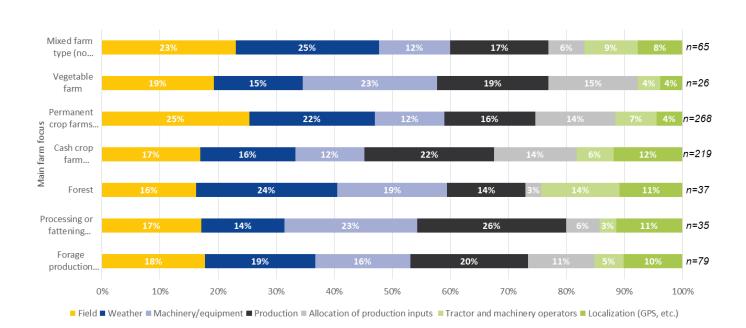


Figure 17: Survey results combined in total - Question 4 and Main farm focus





2.5. Question 5: Which technologies are already adopted at your farm or is considered to be potentially important to acquire in the coming years?

2.5.1. Agro-weather stations

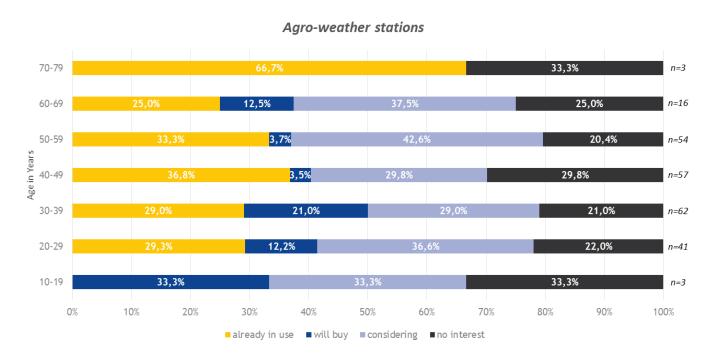


Figure 18: Survey results combined in total – Question 5.1 and Age

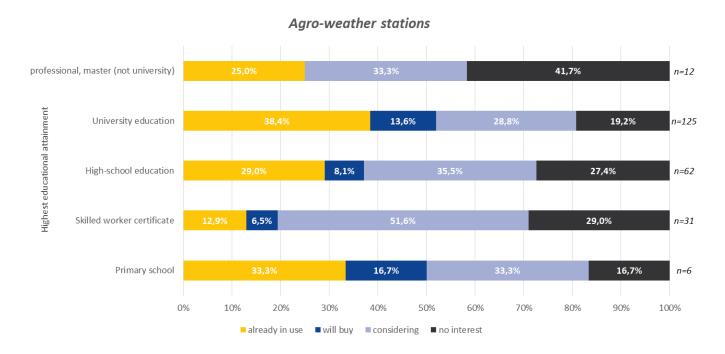


Figure 19: Survey results combined in total – Question 5.1 and Education



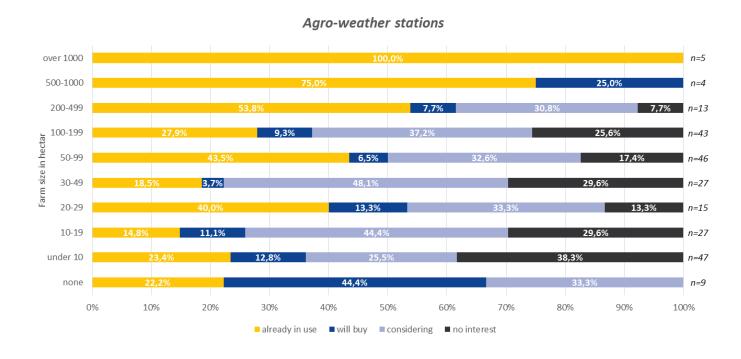


Figure 20: Survey results combined in total – Question 5.1 and Farm size

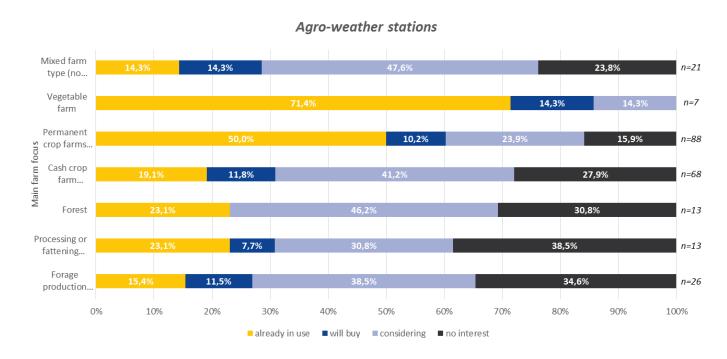


Figure 21: Survey results combined in total – Question 5.1 and Main farm focus





2.5.2. APP's (weather, used machines, market information

APP's (weather, used machines, market information)

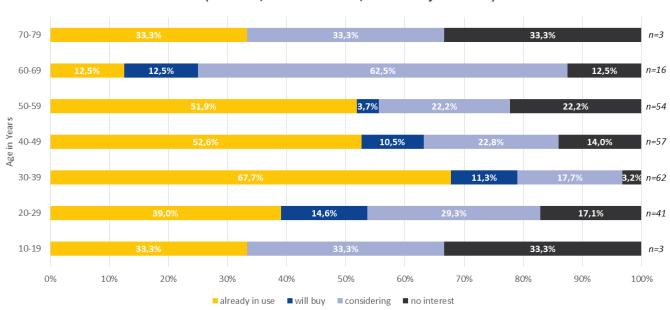


Figure 22: Survey results combined in total – Question 5.2 and Age

APP's (weather, used machines, market information)

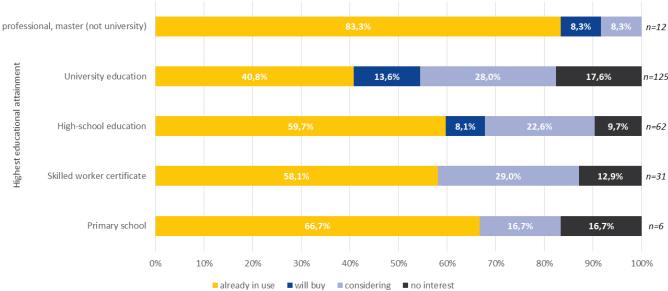


Figure 23: Survey results combined in total – Question 5.2 and Education



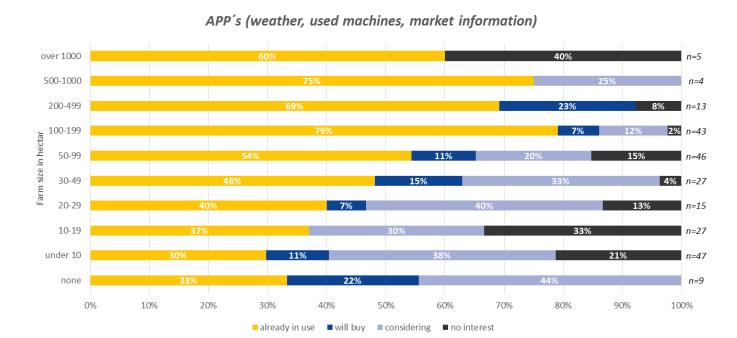


Figure 24: Survey results combined in total – Question 5.2 and Farm size

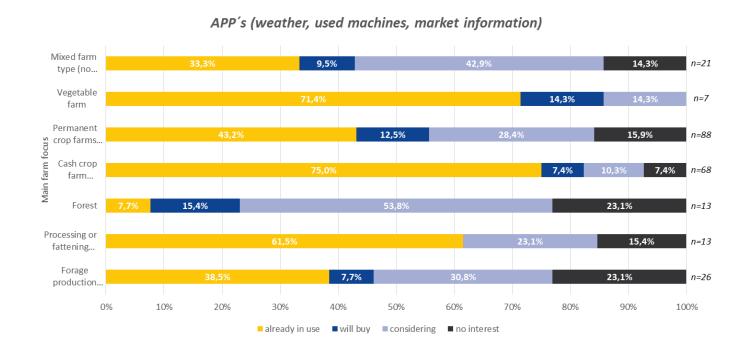


Figure 25: Survey results combined in total – Question 5.2 and Main farm focus





2.5.3. Agro-APP's for crop farming

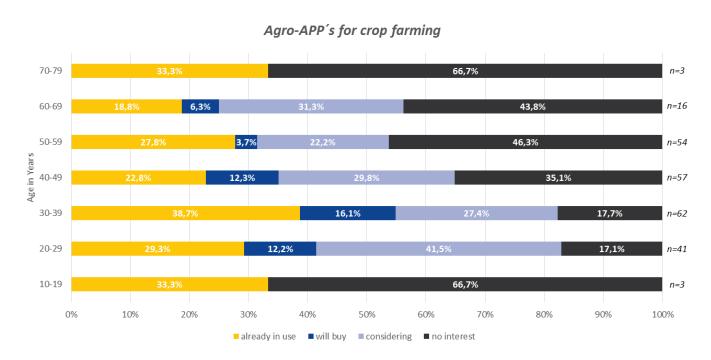


Figure 26: Survey results combined in total – Question 5.3 and Age

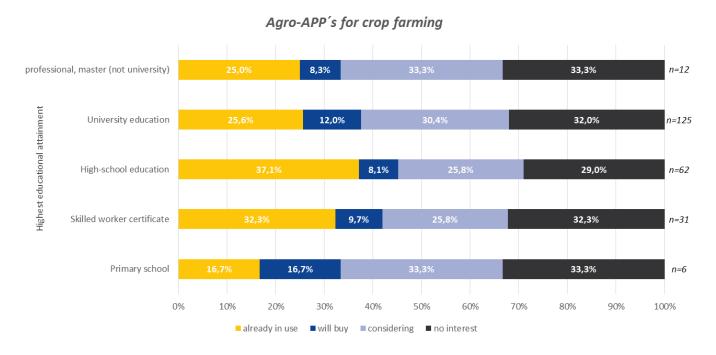


Figure 27: Survey results combined in total – Question 5.3 and Education



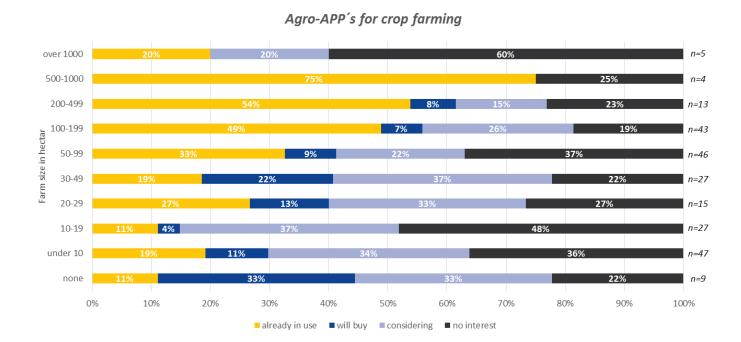


Figure 28: Survey results combined in total – Question 5.3 and Farm size

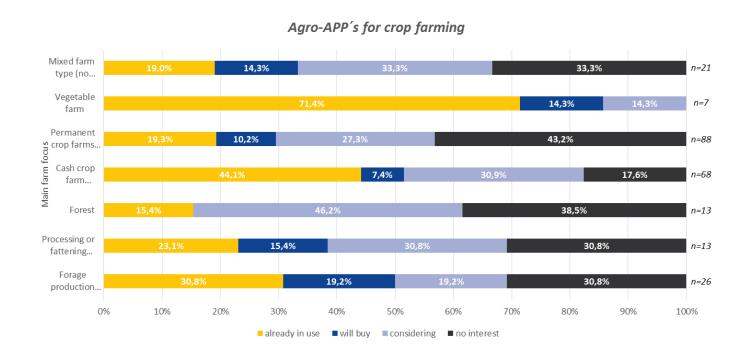


Figure 29: Survey results combined in total – Question 5.3 and Main farm focus





2.5.4. Agro-APP's for livestock farming

Agro-APP's for livestock farming 70-79 60-69 n=16 50-59 n=54 Age in Years 40-49 n = 5730-39 4,8% n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 50% 70% 80% 90% 100% 60%

Figure 30: Survey results combined in total – Question 5.4 and Age

■ will buy

■ considering ■ no interest

already in use

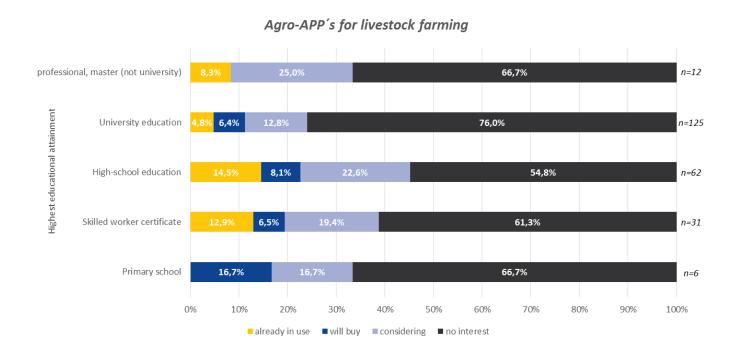


Figure 31: Survey results combined in total - Question 5.4 and Education



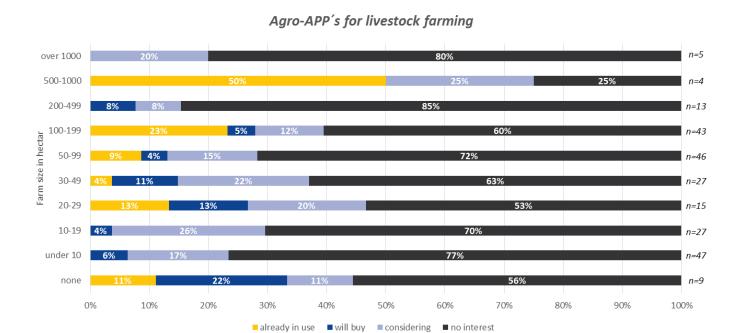


Figure 32: Survey results combined in total – Question 5.4 and Farm size

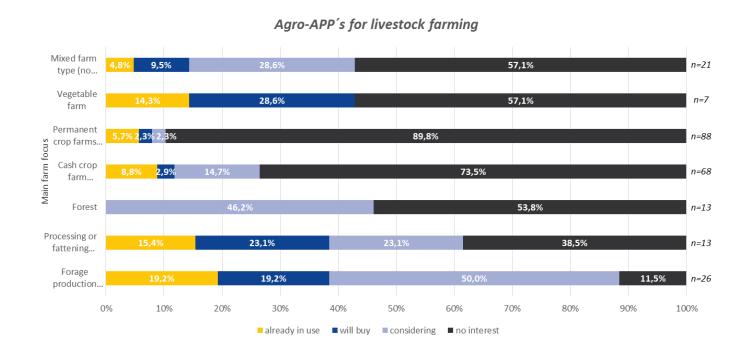


Figure 33: Survey results combined in total – Question 5.4 and Main farm focus





2.5.5. GPS

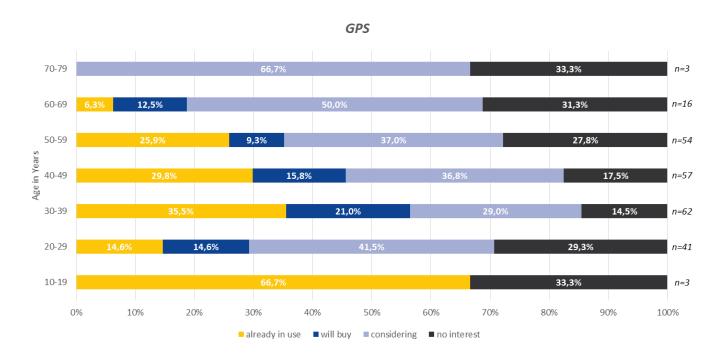


Figure 34: Survey results combined in total – Question 5.5 and Age

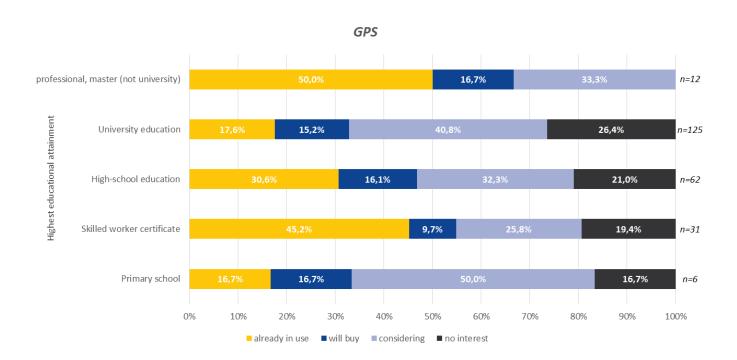


Figure 35: Survey results combined in total - Question 5.5 and Education





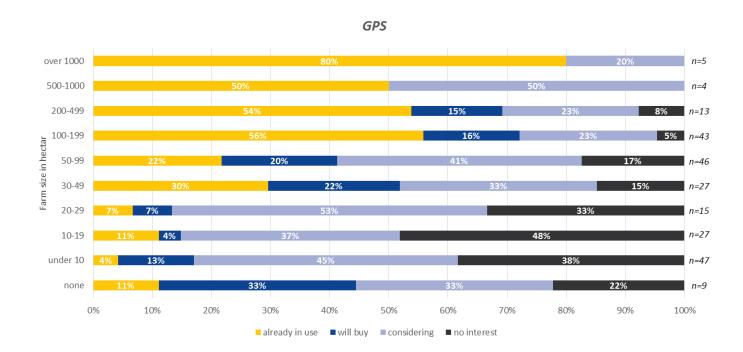


Figure 36: Survey results combined in total – Question 5.5 and Farm size

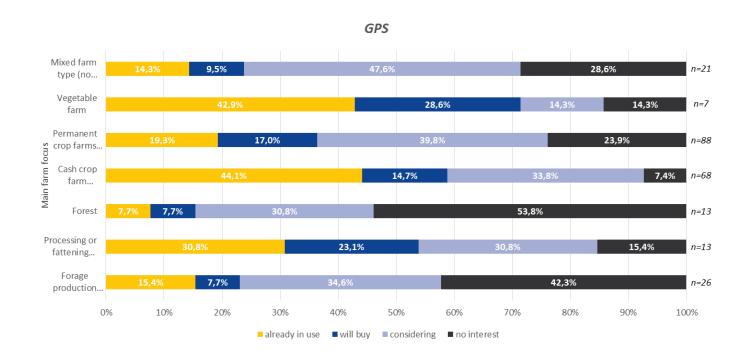


Figure 37: Survey results combined in total – Question 5.5 and Main farm focus





2.5.6. Sensors for crop farming

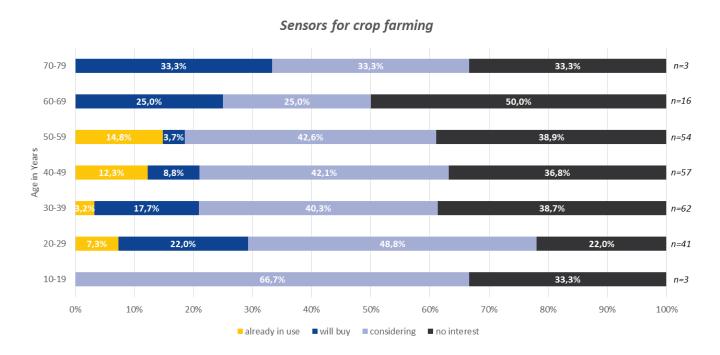


Figure 38: Survey results combined in total – Question 5.6 and Age

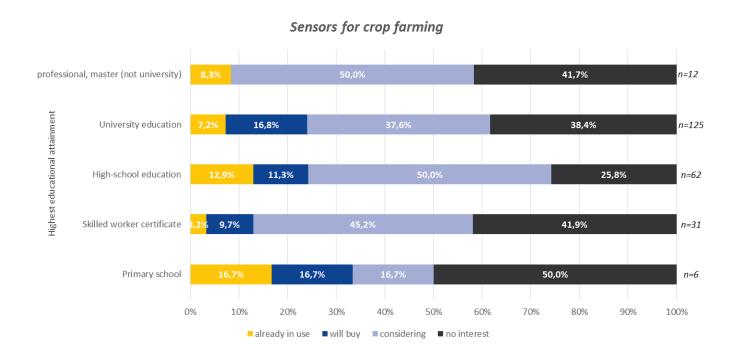


Figure 39: Survey results combined in total - Question 5.6 and Education



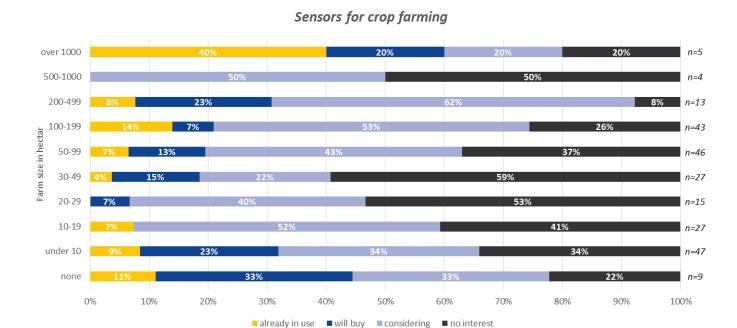


Figure 40: Survey results combined in total – Question 5.6 and Farm size

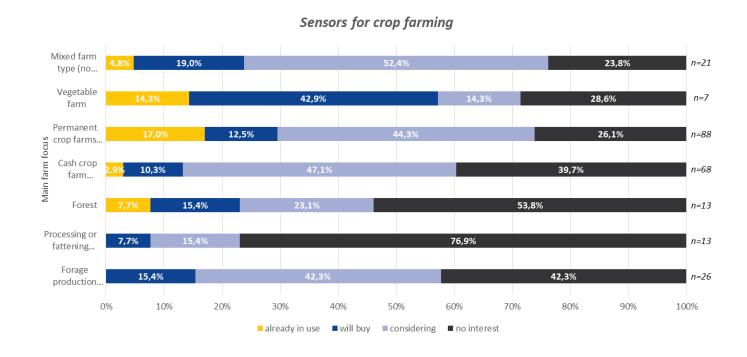


Figure 41: Survey results combined in total – Question 5.6 and Main farm focus





2.5.7. Yield modeling systems

Yield modeling systems 70-79 60-69 n=16 50-59 n=54 Age in Years 40-49 n = 5730-39 17,7% n=62 20-29 10-19 n=3 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% ■ considering ■ no interest

Figure 42: Survey results combined in total – Question 5.7 and Age

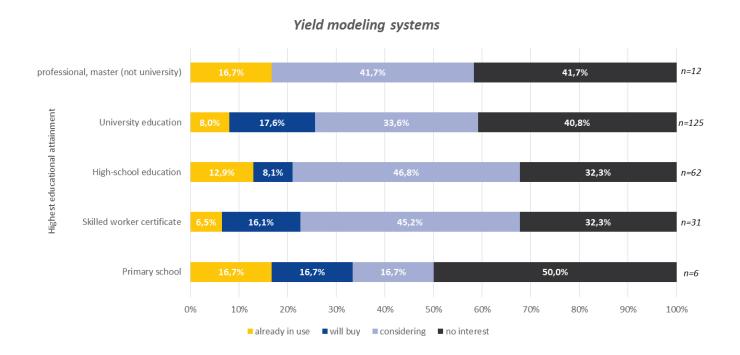


Figure 43: Survey results combined in total – Question 5.7 and Education



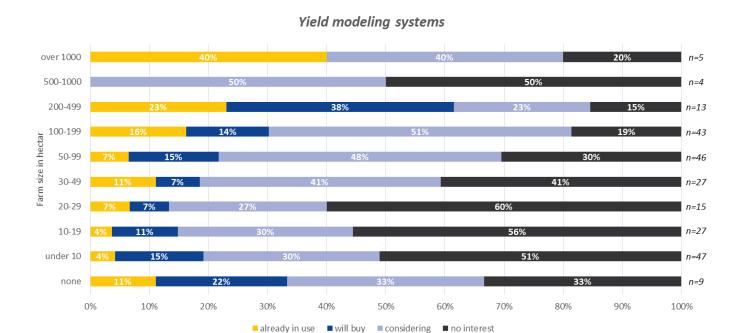


Figure 44: Survey results combined in total – Question 5.7 and Farm size

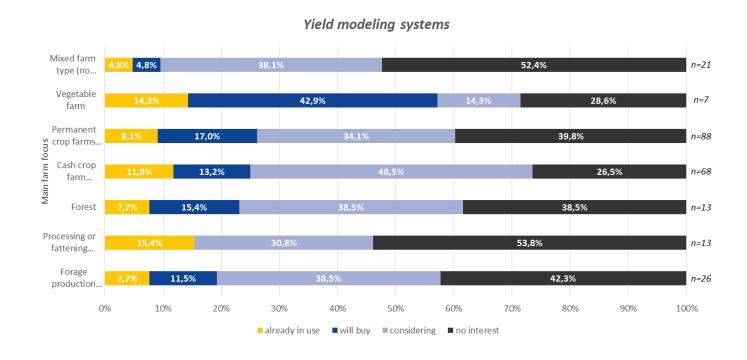


Figure 45: Survey results combined in total – Question 5.7 and Main farm focus





2.5.8. Drones

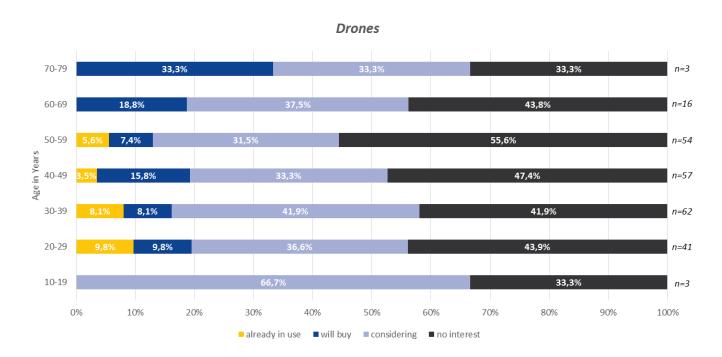


Figure 46: Survey results combined in total – Question 5.8 and Age

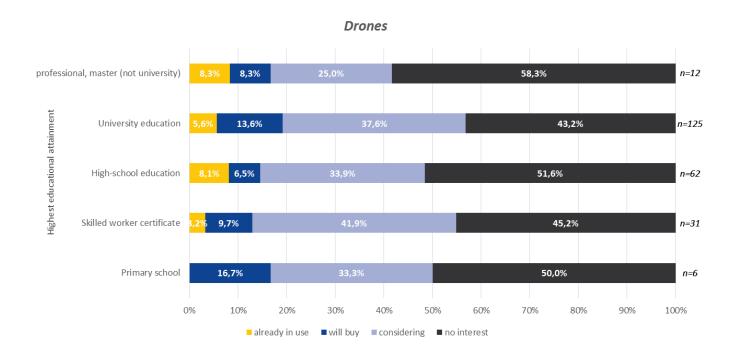


Figure 47: Survey results combined in total - Question 5.8 and Education



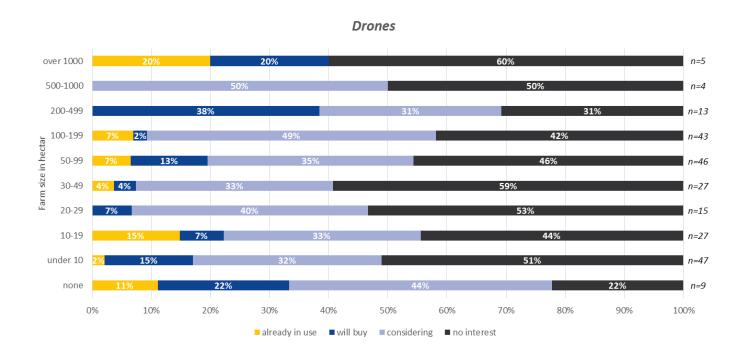


Figure 48: Survey results combined in total – Question 5.8 and Farm size

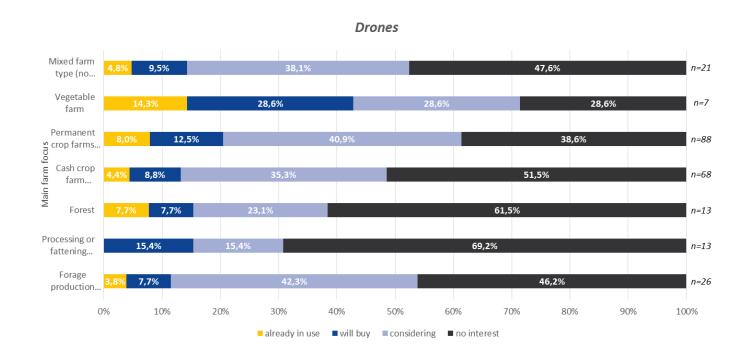


Figure 49: Survey results combined in total – Question 5.8 and Main farm focus





2.5.9. Precision irrigation systems

Precision irrigation systems 70-79 60-69 n=16 50-59 n=54 Age in Years 40-49 n=5730-39 n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Figure 50: Survey results combined in total – Question 5.9 and Age

■ will buy

■ considering ■ no interest

already in use

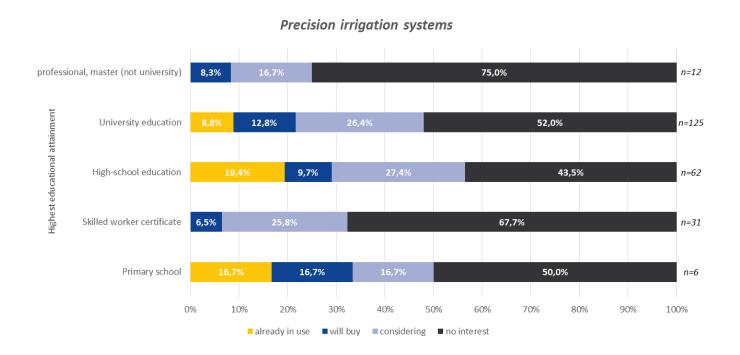


Figure 51: Survey results combined in total - Question 5.9 and Education





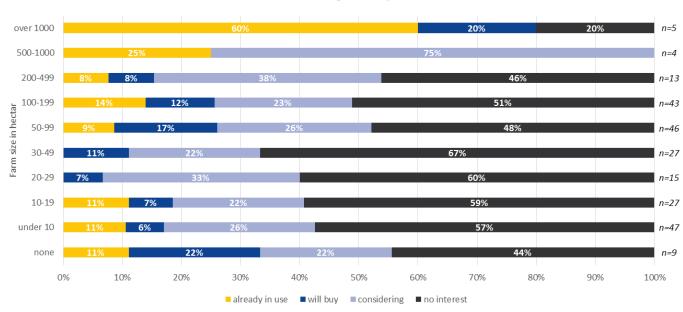


Figure 52: Survey results combined in total – Question 5.9 and Farm size

Precision irrigation systems Mixed farm 4,8% 42,9% type (no... Vegetable 28,6% n=7 farm Permanent n=88 crop farms... Cash crop farm... Forest n=68 Forest n=13 Processing or n=13 fattening... Forage n=26 production.. 0% 10% 20% 70% 80% 90% 100% ■ already in use ■ will buy ■ considering ■ no interest

Figure 53: Survey results combined in total – Question 5.9 and Main farm focus





2.5.10. Technology for site-specific fertilization

Technology for site-specific fertilization 70-79 60-69 n=16 n=54 Age in Years 40-49 n = 5730-39 n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 70% 80% 90% 100% 50% 60%

■ considering ■ no interest

Figure 54: Survey results combined in total - Question 5.10 and Age

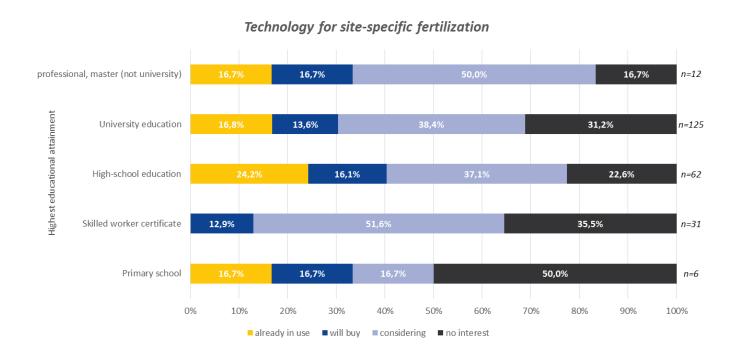


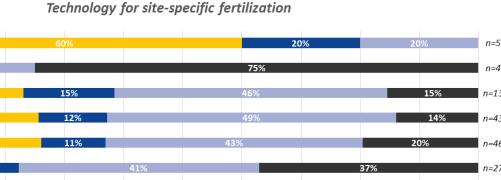
Figure 55: Survey results combined in total – Question 5.10 and Education



over 1000

500-1000

200-499



100-199 n=43 Farm size in hectar 50-99 n=46 30-49 n=27 20-29 n = 1.510-19 n=27under 10 none n=9 0% 10% 20% 30% 40% 70% 80% 90% 50% 60% 100% ■ already in use ■ will buy ■ considering ■ no interest

Figure 56: Survey results combined in total – Question 5.10 and Farm size

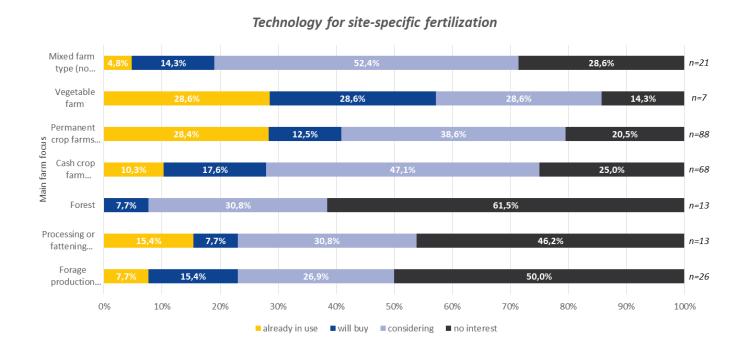


Figure 57: Survey results combined in total - Question 5.10 and Main farm focus





2.5.11. Technology for site-specific tillage and sowing

Technology for site-specific tillage and sowing

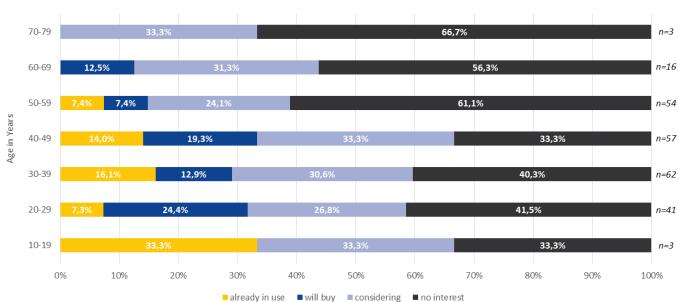


Figure 58: Survey results combined in total – Question 5.11 and Age

Technology for site-specific tillage and sowing

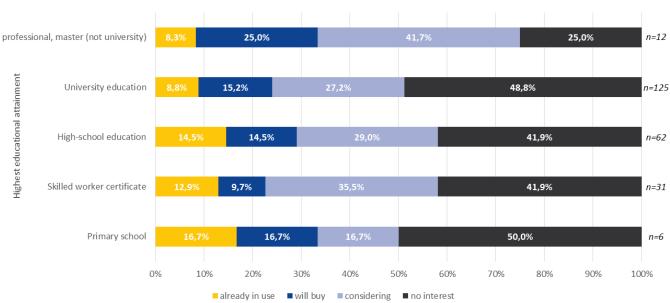


Figure 59: Survey results combined in total – Question 5.11 and Education



production..

0%

10%

20%

30%

already in use



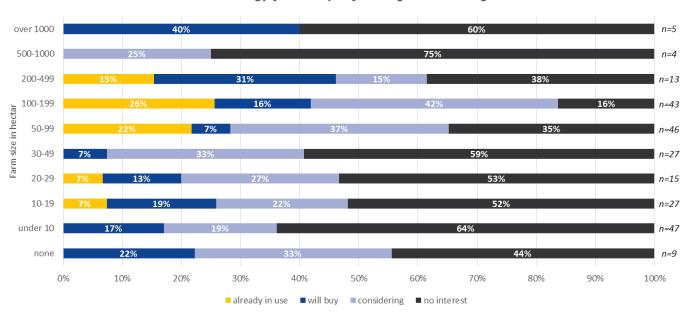
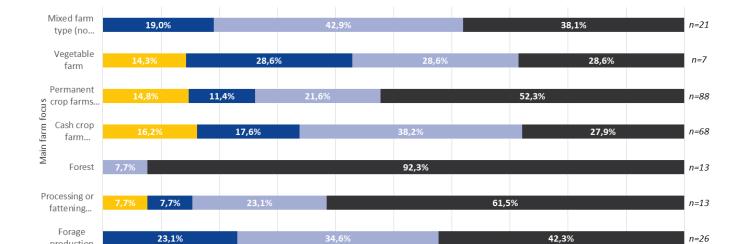


Figure 60: Survey results combined in total – Question 5.11 and Farm size



Technology for site-specific tillage and sowing

Figure 61: Survey results combined in total - Question 5.11 and Main farm focus

50%

60%

■ considering ■ no interest

70%

80%

90%

100%

40%

■ will buy



0%

10%

20%

30%



70%

80%

90%

100%

2.5.12. Technology for site-specific chemical plant protection

Technology for site-specific chemical plant protection 70-79 60-69 n=16 50-59 n=54 Age in Years 40-49 n = 5730-39 n=62 20-29 n=41 10-19 n=3

50%

60% ■ considering ■ no interest

Figure 62: Survey results combined in total - Question 5.12 and Age

40%

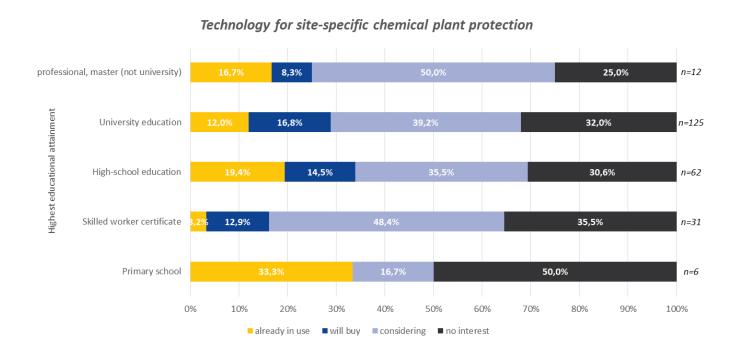


Figure 63: Survey results combined in total – Question 5.12 and Education





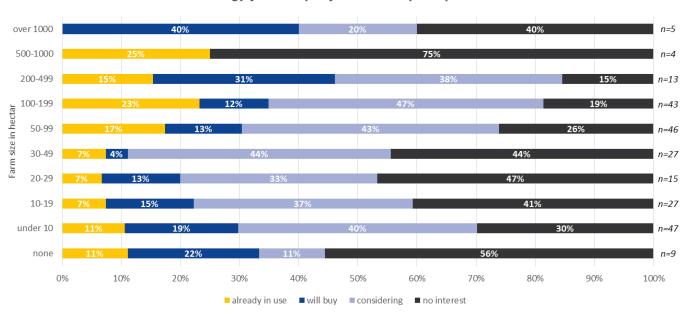


Figure 64: Survey results combined in total – Question 5.12 and Farm size

Technology for site-specific chemical plant protection Mixed farm n=21 type (no... Vegetable 42,9% n=7 farm Permanent Cash crop farm... n=88 n=68 Forest Processing or n=13 fattening... Forage n=26 production. 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Figure 65: Survey results combined in total – Question 5.12 and Main farm focus

■ will buy

■ considering ■ no interest

already in use





2.5.13. Augmented reality

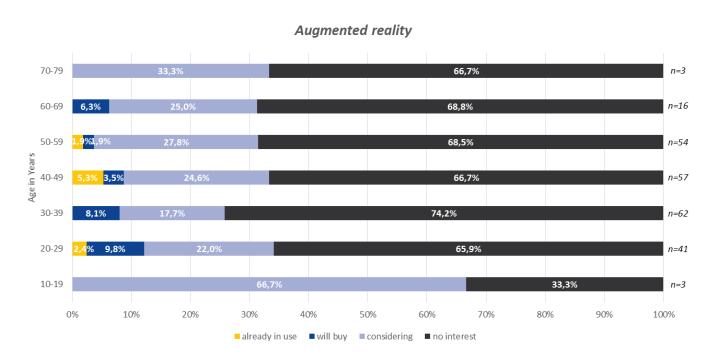


Figure 66: Survey results combined in total – Question 5.13 and Age

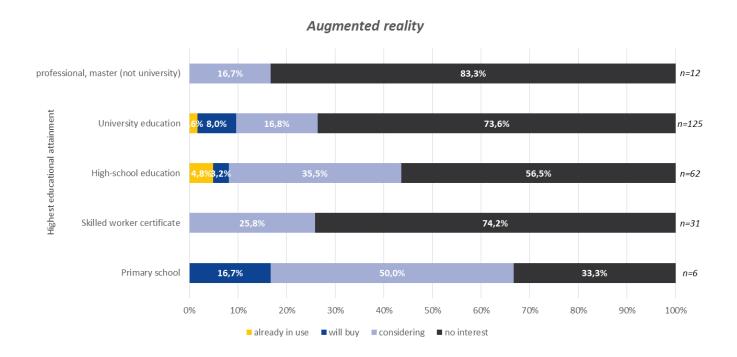


Figure 67: Survey results combined in total – Question 5.13 and Education



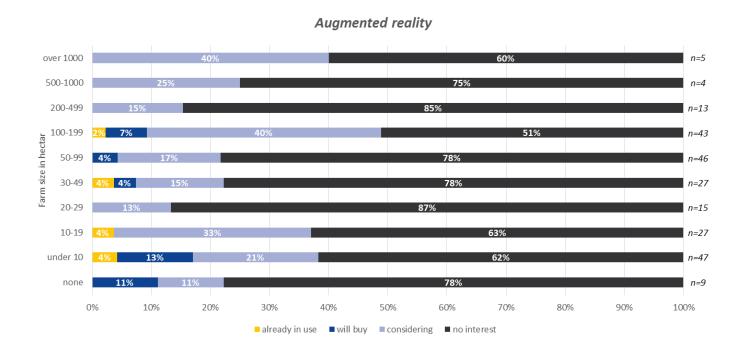


Figure 68: Survey results combined in total – Question 5.13 and Farm size

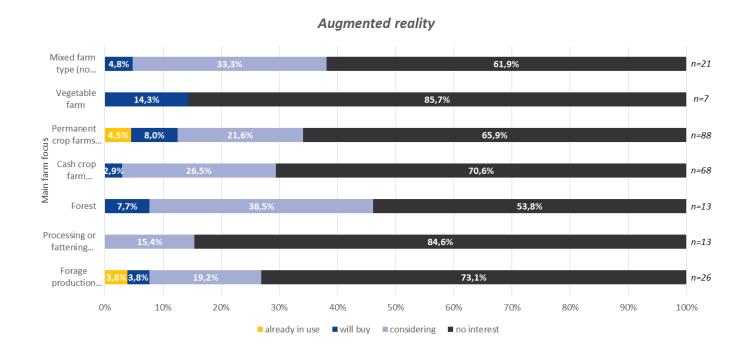


Figure 69: Survey results combined in total – Question 5.13 and Main farm focus





2.5.14. Farmmanagement- and Informationsystems (FMIS)

Farmmanagement- and Informationsystems (FMIS)

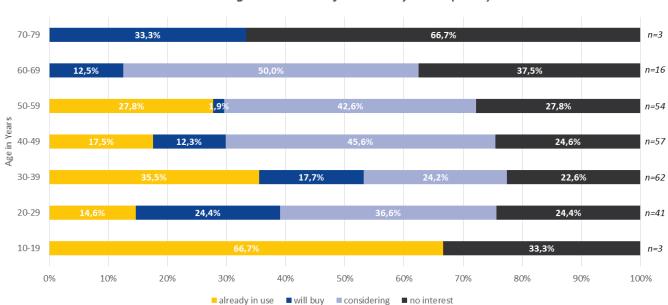


Figure 70: Survey results combined in total - Question 5.14 and Age

Farmmanagement- and Informationsystems (FMIS) professional, master (not university) 8,3% 25,0% n=12 Highest educational attainment University education 15,2% 29,6% n=125 12,9% High-school education 16,1% n=62 Skilled worker certificate 9,7% 35,5% n=31 Primary school 16,7% 16,7% n=6 0% 30% 40% 60% 70% 80% 90% 100% 50% already in use ■ will buy ■ considering ■ no interest

Figure 71: Survey results combined in total – Question 5.14 and Education



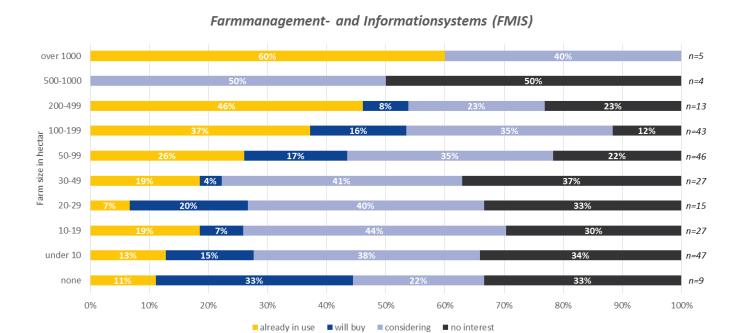


Figure 72: Survey results combined in total – Question 5.14 and Farm size

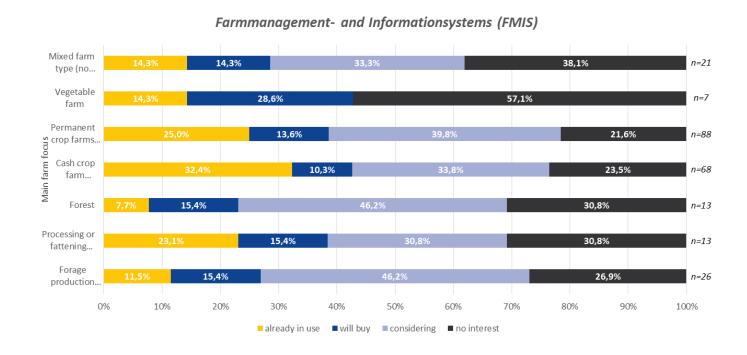


Figure 73: Survey results combined in total – Question 5.14 and Main farm focus





2.6. Question 6: In which of the following PF applications do you see a benefit or an opportunity, or rather a disadvantage or a risk, for your running your farm in the future?

2.6.1. Tracking systems (GPS)

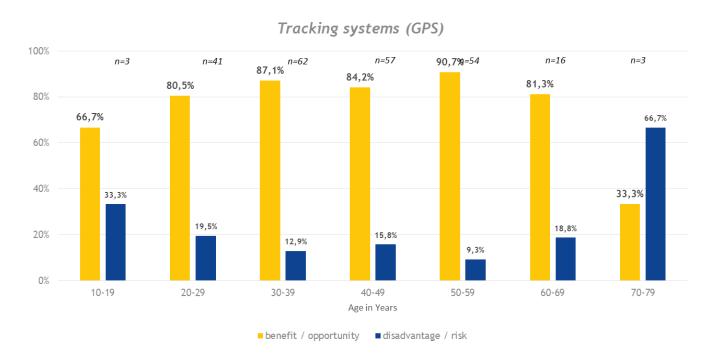


Figure 74: Survey results combined in total – Question 6.1 and Age

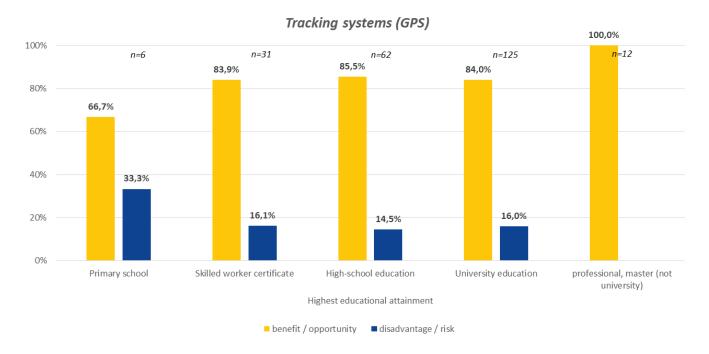
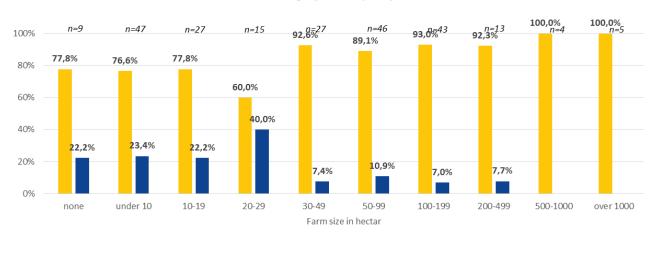


Figure 75: Survey results combined in total - Question 6.1 and Education



Tracking systems (GPS)



■ benefit / opportunity ■ disadvantage / risk

Figure 76: Survey results combined in total – Question 6.1 and Farm size

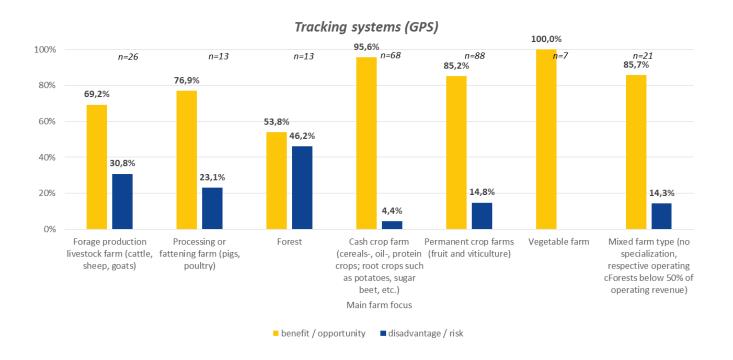


Figure 77: Survey results combined in total – Question 6.1 and Main farm focus





2.6.2. Mobile-APPS

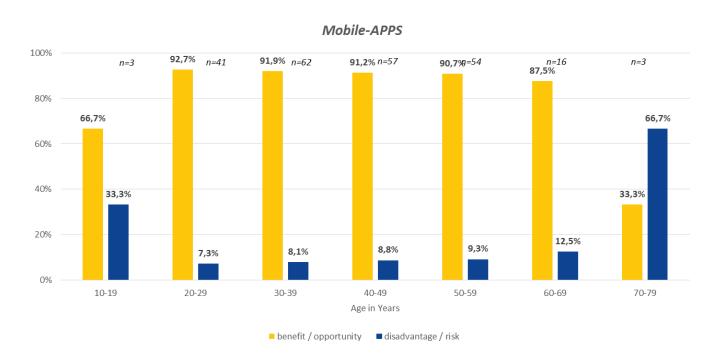


Figure 78: Survey results combined in total – Question 6.2 and Age

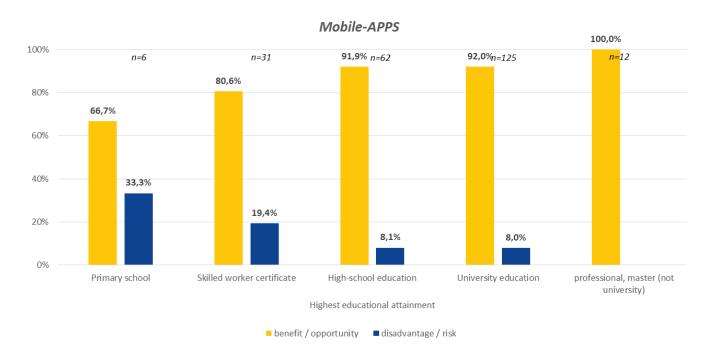


Figure 79: Survey results combined in total - Question 6.2 and Education



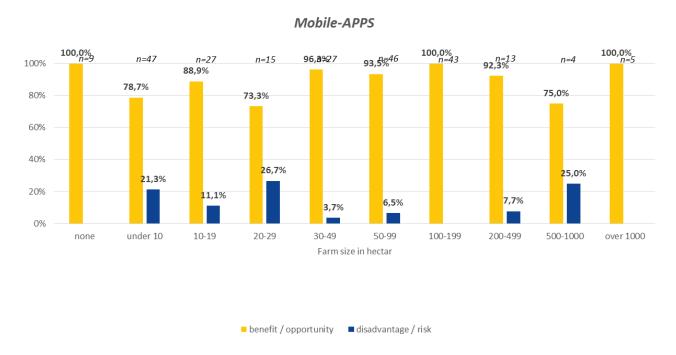


Figure 80: Survey results combined in total – Question 6.2 and Farm size

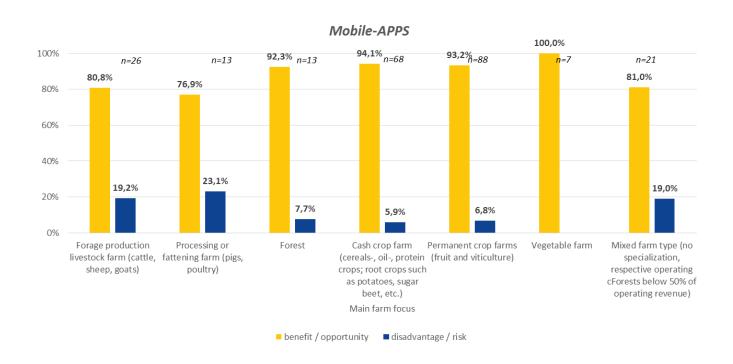


Figure 81: Survey results combined in total – Question 6.2 and Main farm focus





2.6.3. Satellite data

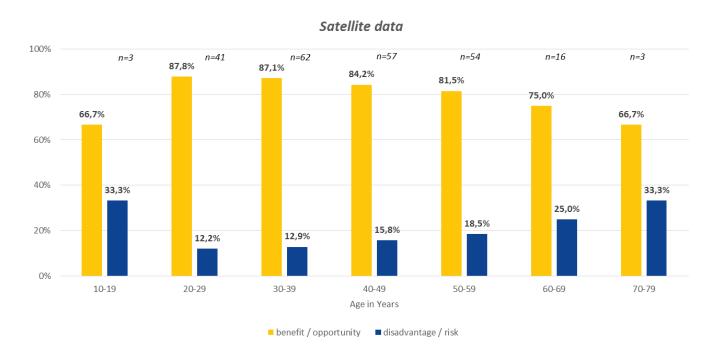


Figure 82: Survey results combined in total – Question 6.3 and Age

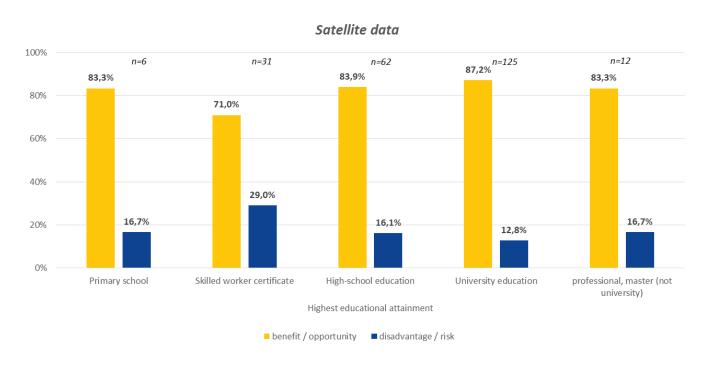
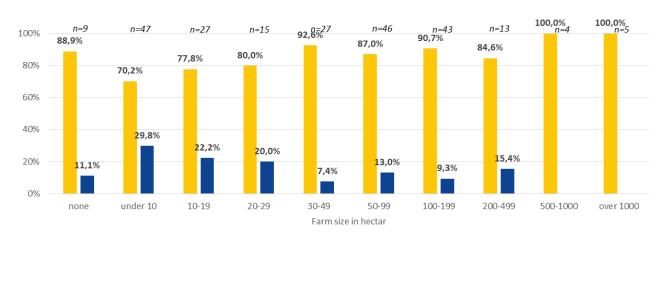


Figure 83: Survey results combined in total - Question 6.3 and Education



Satellite data



disadvantage / risk

Figure 84: Survey results combined in total – Question 6.3 and Farm size

benefit / opportunity

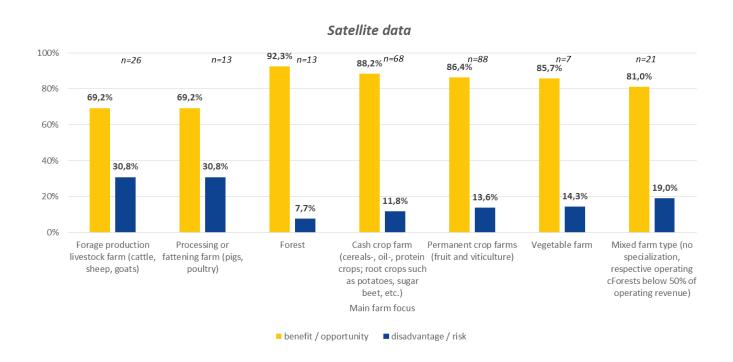


Figure 85: Survey results combined in total – Question 6.3 and Main farm focus





2.6.4. Soil samples Services

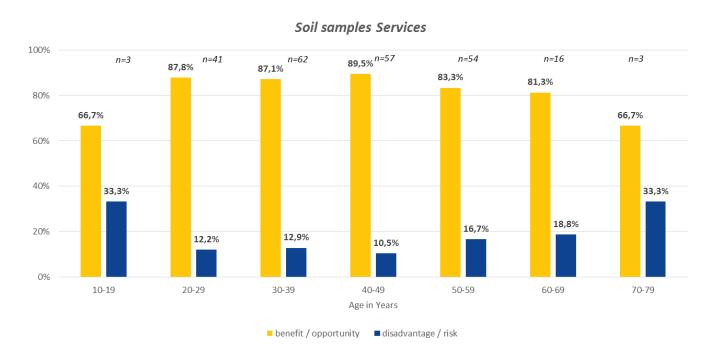


Figure 86: Survey results combined in total – Question 6.4 and Age

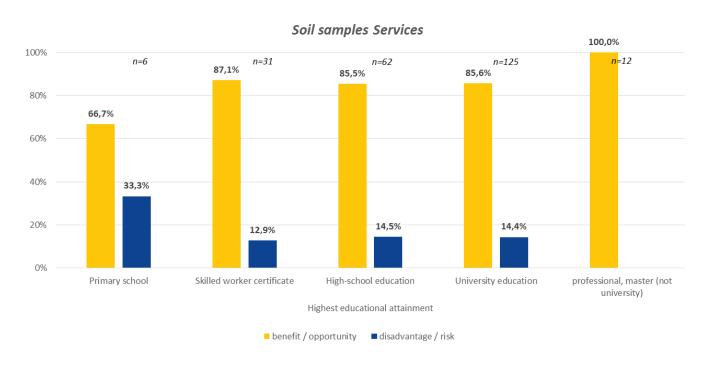


Figure 87: Survey results combined in total - Question 6.4 and Education





Soil samples Services

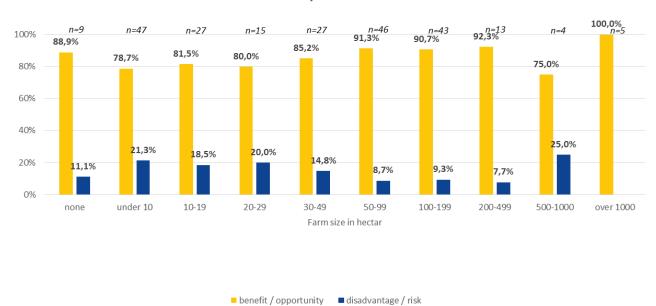


Figure 88: Survey results combined in total – Question 6.4 and Farm size

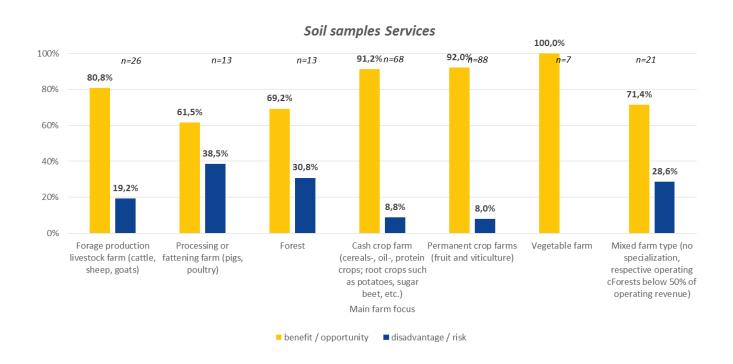


Figure 89: Survey results combined in total – Question 6.4 and Main farm focus





2.6.5. Use of robots

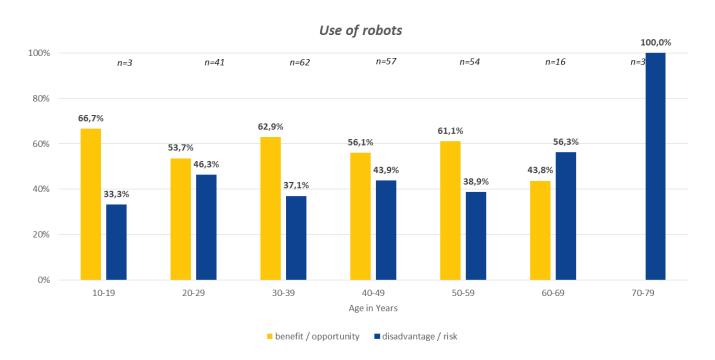


Figure 90: Survey results combined in total – Question 6.5 and Age

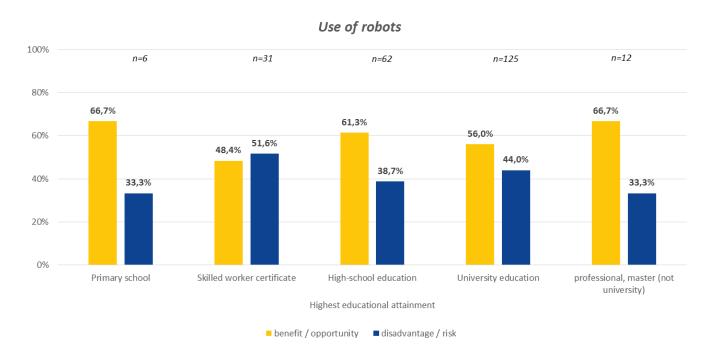


Figure 91: Survey results combined in total - Question 6.5 and Education





Use of robots

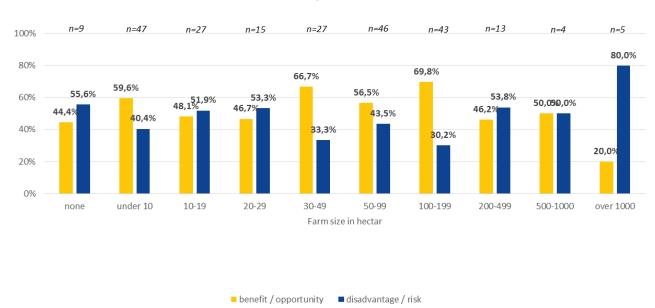


Figure 92: Survey results combined in total – Question 6.5 and Farm size

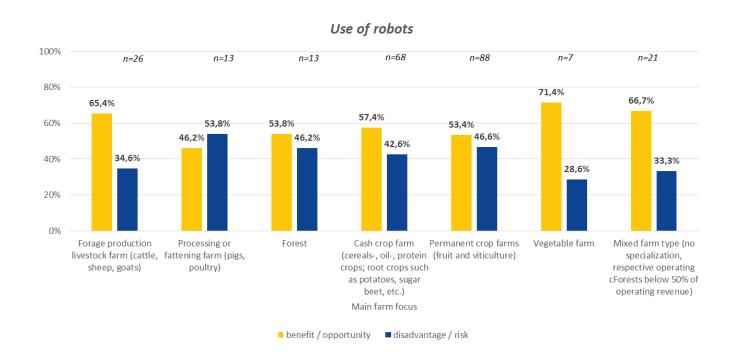


Figure 93: Survey results combined in total – Question 6.5 and Main farm focus





2.6.6. Use of drones

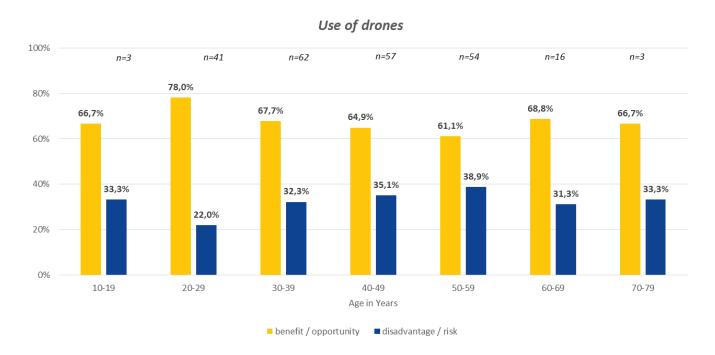


Figure 94: Survey results combined in total – Question 6.6 and Age

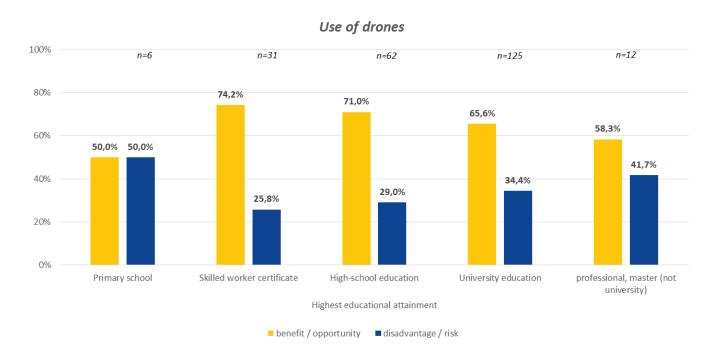


Figure 95: Survey results combined in total – Question 6.6 and Education



Use of drones

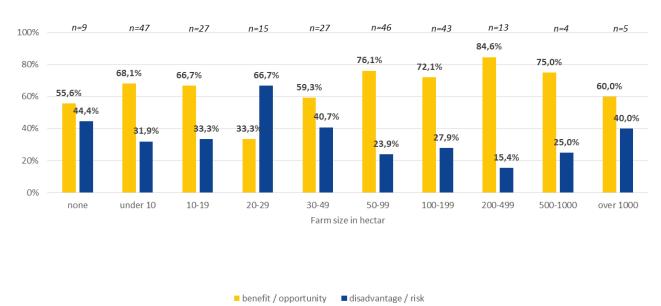


Figure 96: Survey results combined in total – Question 6.6 and Farm size

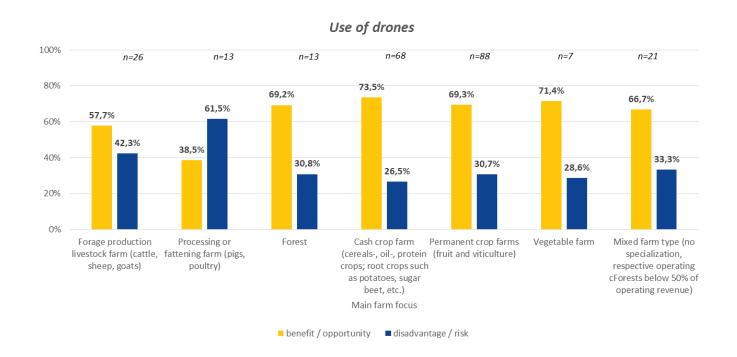


Figure 97: Survey results combined in total – Question 6.6 and Main farm focus





2.6.7. Site-specific fertilization

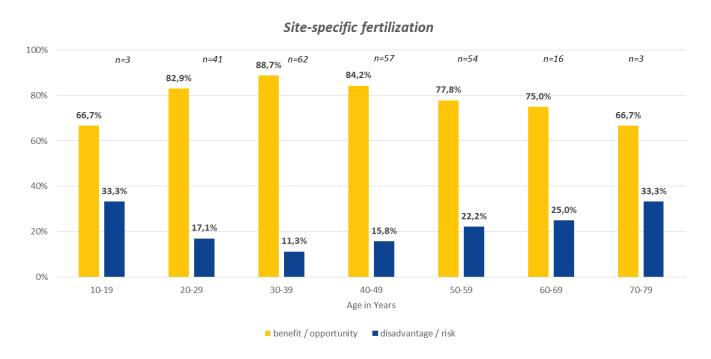


Figure 98: Survey results combined in total – Question 6.7 and Age

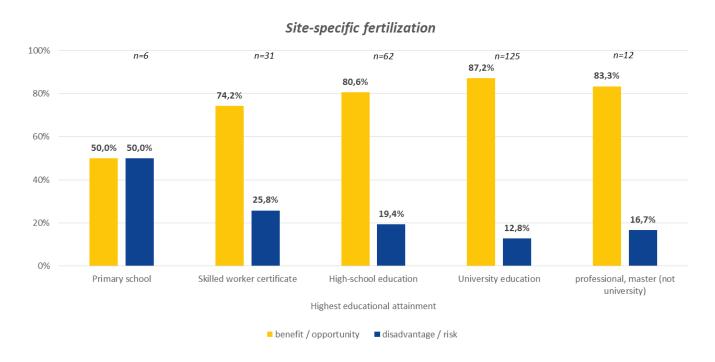
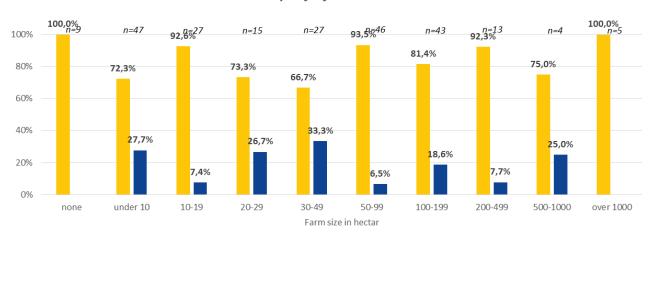


Figure 99: Survey results combined in total - Question 6.7 and Education



Site-specific fertilization



disadvantage / risk

Figure 100: Survey results combined in total – Question 6.7 and Farm size

benefit / opportunity

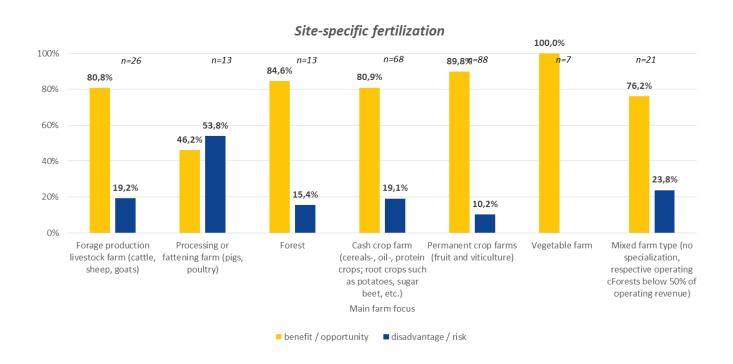


Figure 101: Survey results combined in total - Question 6.7 and Main farm focus





2.6.8. Site-specific tillage and sowing

Site-specific tillage and sowing 100% n=57 n=16 n=41 n=62 n=54 n=3 n=3 82,9% 80,6% 80,7% 80% 66,7% 66,7% 66,7% 62,5% 60% 37,5% 40% 33,3% 33,3% 33,3% 19,4% 19.3% 17,1% 20% 0% 10-19 20-29 30-39 40-49 50-59 60-69 70-79 Age in Years ■ benefit / opportunity ■ disadvantage / risk

Figure 102: Survey results combined in total - Question 6.8 and Age

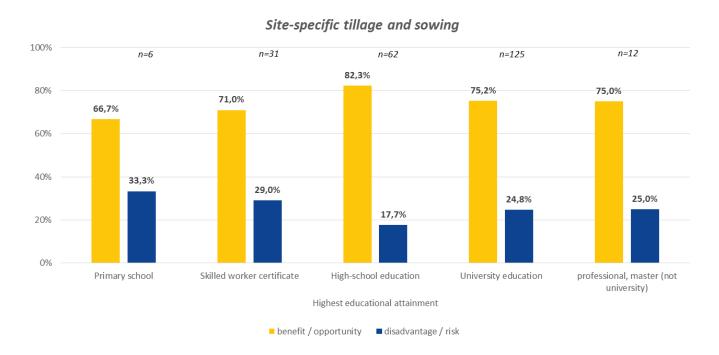


Figure 103: Survey results combined in total - Question 6.8 and Education



Site-specific tillage and sowing

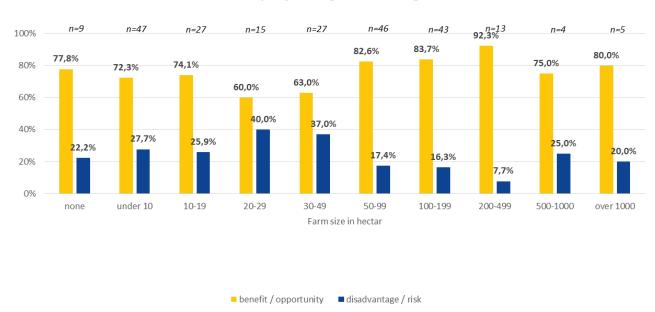


Figure 104: Survey results combined in total – Question 6.8 and Farm size

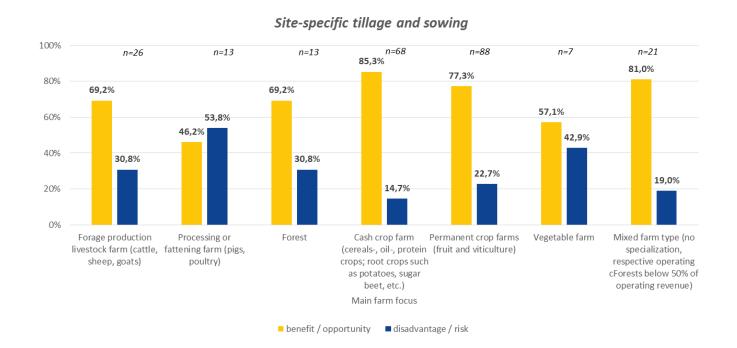


Figure 105: Survey results combined in total - Question 6.8 and Main farm focus





2.6.9. Site-specific plant protection

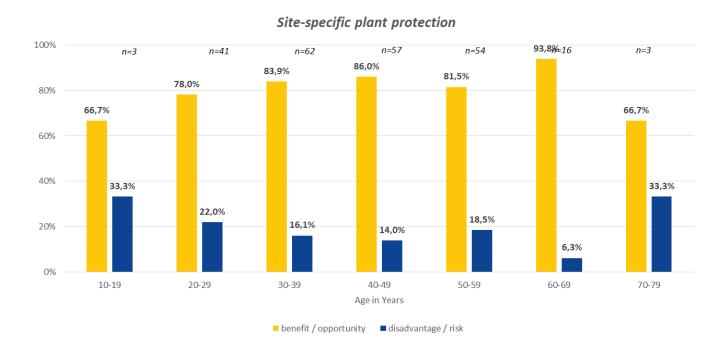


Figure 106: Survey results combined in total - Question 6.9 and Age

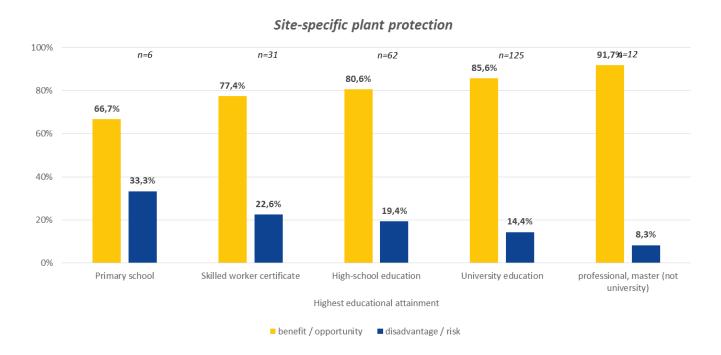


Figure 107: Survey results combined in total - Question 6.9 and Education



Site-specific plant protection

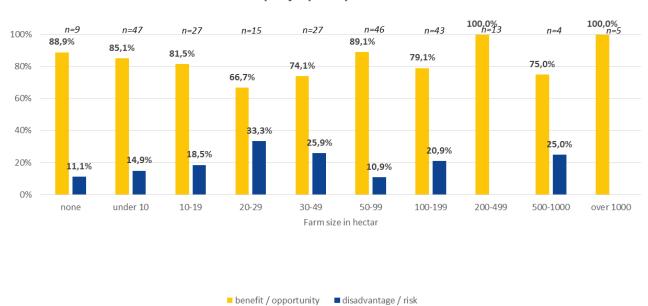


Figure 108: Survey results combined in total – Question 6.9 and Farm size

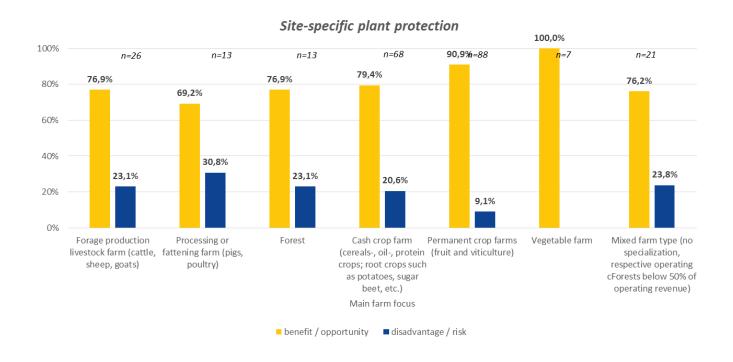


Figure 109: Survey results combined in total - Question 6.9 and Main farm focus





2.6.10. Adequate irrigation

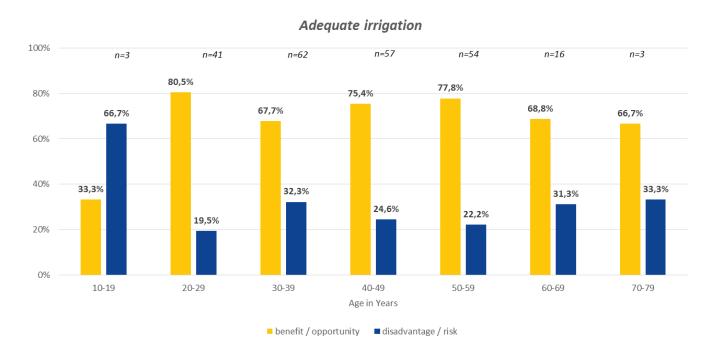


Figure 110: Survey results combined in total – Question 6.10 and Age

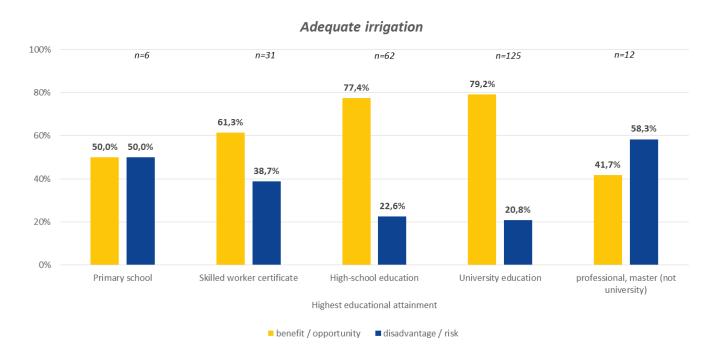
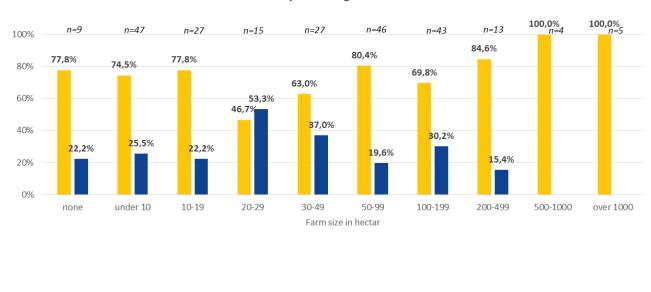


Figure 111: Survey results combined in total – Question 6.10 and Education



Adequate irrigation



disadvantage / risk

Figure 112: Survey results combined in total – Question 6.10 and Farm size

benefit / opportunity

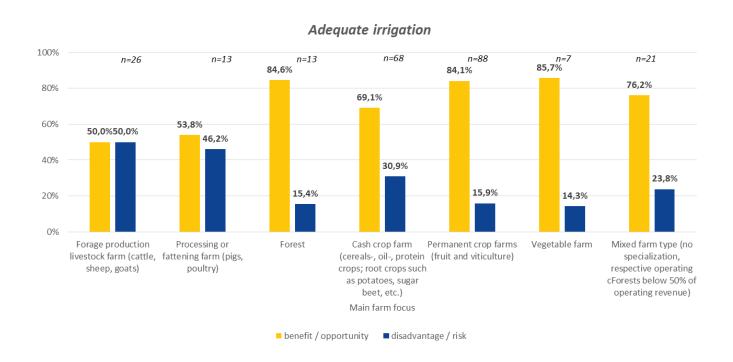


Figure 113: Survey results combined in total - Question 6.10 and Main farm focus





2.6.11. Real-time farm-, machinery-, and devices data

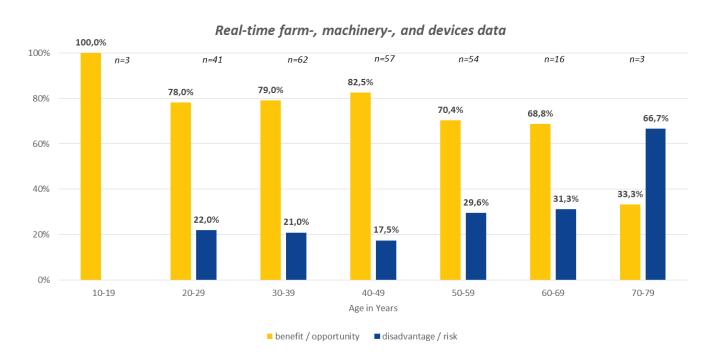


Figure 114: Survey results combined in total – Question 6.11 and Age

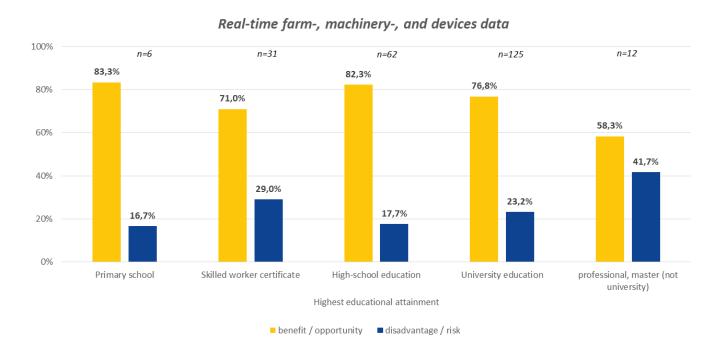


Figure 115: Survey results combined in total – Question 6.11 and Education





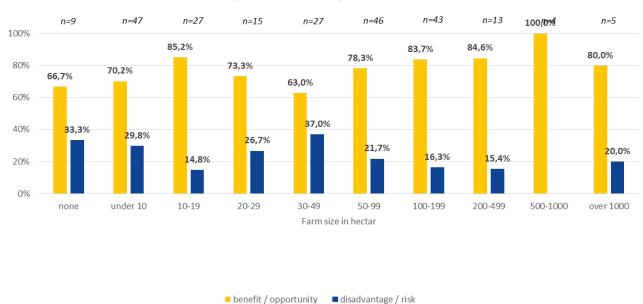


Figure 116: Survey results combined in total – Question 6.11 and Farm size

Real-time farm-, machinery-, and devices data

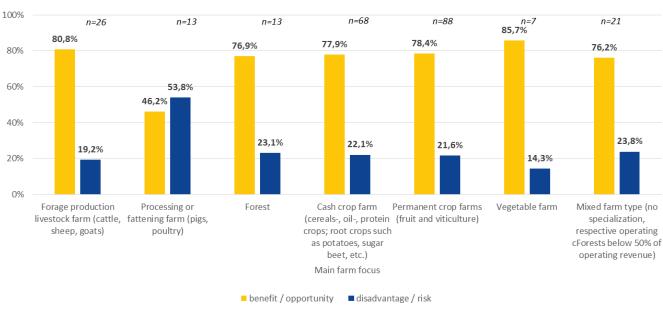


Figure 117: Survey results combined in total – Question 6.11 and Main farm focus





2.6.12. Records (documentation obligations)

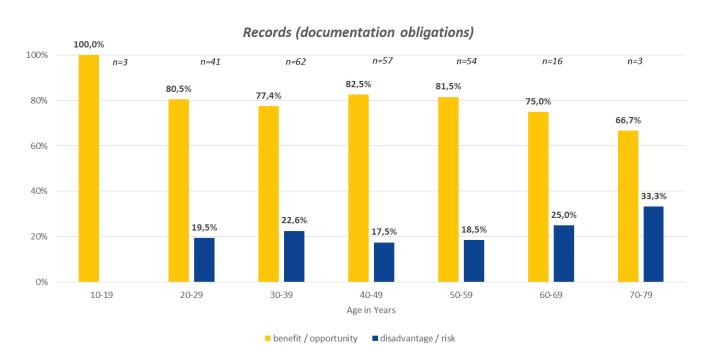


Figure 118: Survey results combined in total – Question 6.12 and Age

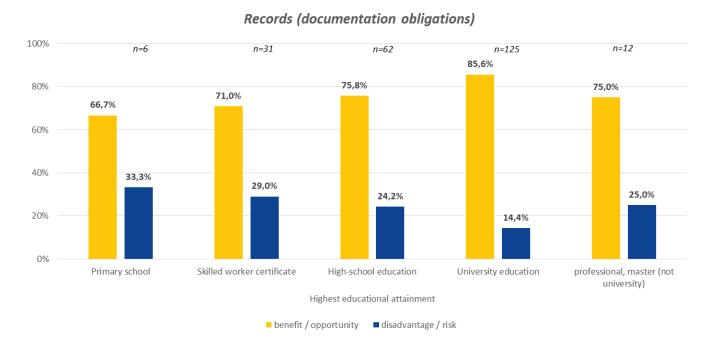


Figure 119: Survey results combined in total - Question 6.12 and Education





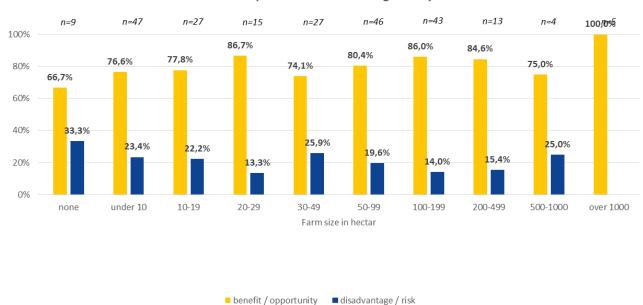


Figure 120: Survey results combined in total – Question 6.12 and Farm size

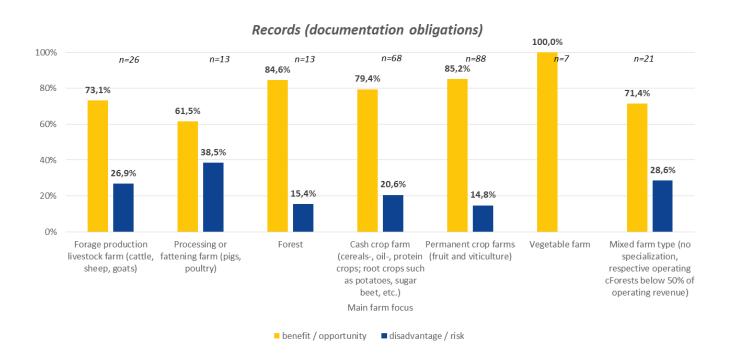


Figure 121: Survey results combined in total – Question 6.12 and Main farm focus





2.6.13. Records for supporting farm business decisions

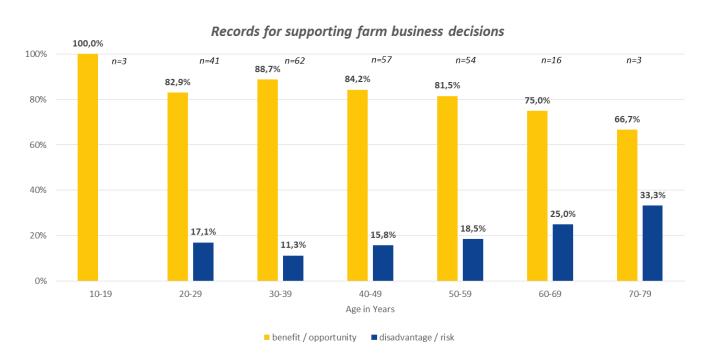


Figure 122: Survey results combined in total – Question 6.13 and Age

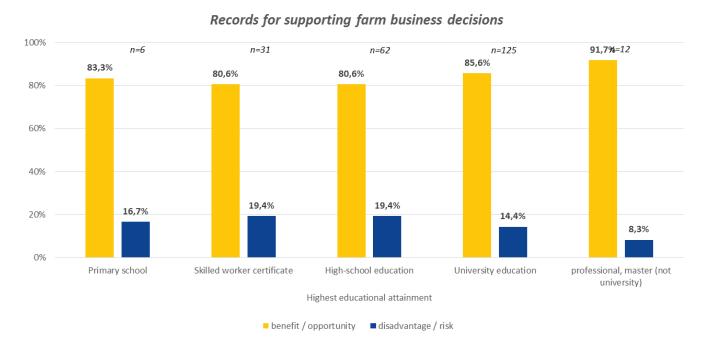


Figure 123: Survey results combined in total - Question 6.13 and Education





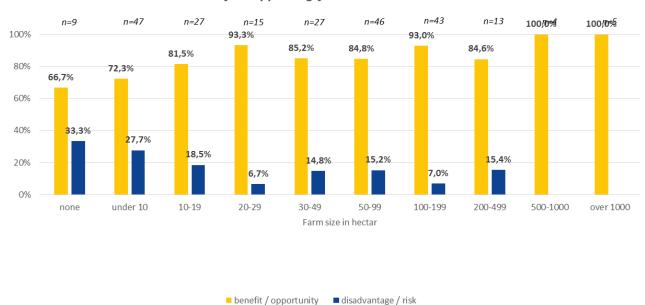


Figure 124: Survey results combined in total – Question 6.13 and Farm size

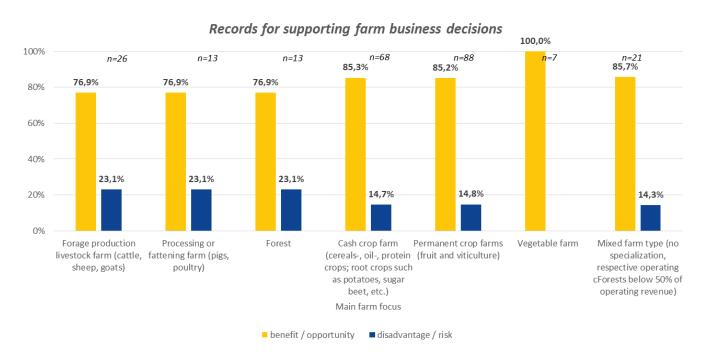


Figure 125: Survey results combined in total – Question 6.13 and Main farm focus





2.7. Question 7: In which of the following processes do you see a potential through PF applications for your farm?

2.7.1. Site-specific organic fertilization

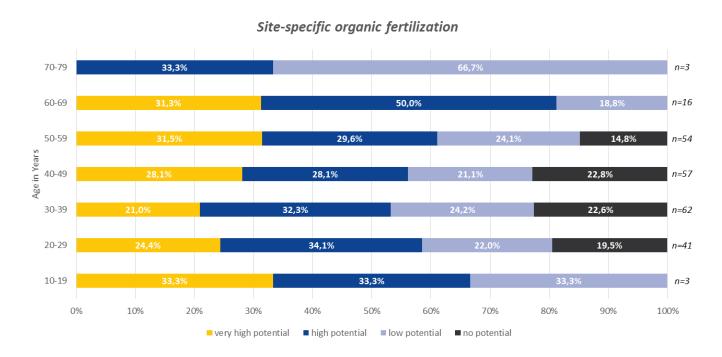


Figure 126: Survey results combined in total – Question 7.1 and Age

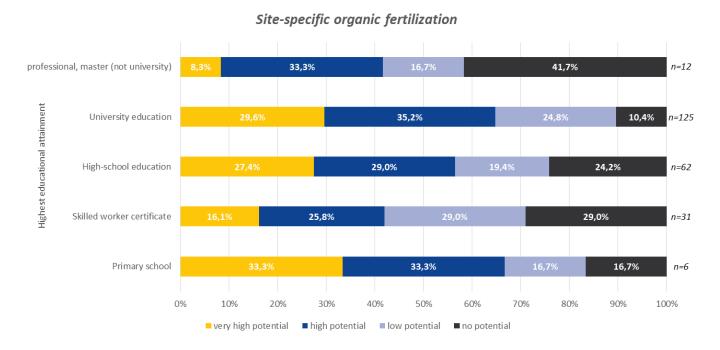


Figure 127: Survey results combined in total - Question 7.1 and Education



Site-specific organic fertilization

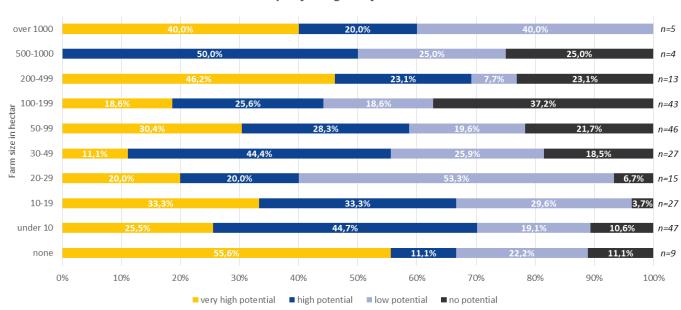


Figure 128: Survey results combined in total – Question 7.1 and Farm size



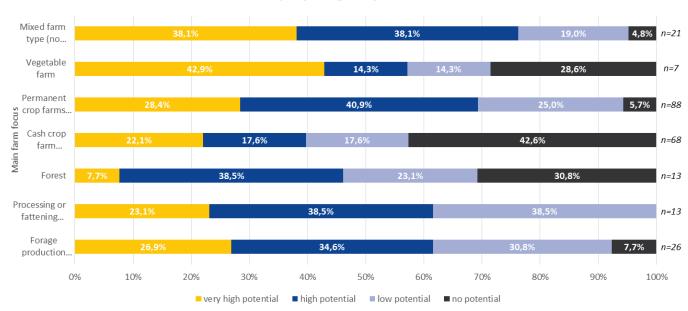


Figure 129: Survey results combined in total - Question 7.1 and Main farm focus





2.7.2. Site-specific mineral fertilization

Site-specific mineral fertilization 70-79 60-69 n=16 29,6% n=54 Age in Years 40-49 n=57 30-39 20-29 10-19 n=3 10% 20% 30% 50% 60% 70% 100% 40% 90%

Figure 130: Survey results combined in total - Question 7.2 and Age

very high potential ■ high potential ■ low potential ■ no potential ■ very high potential ■ high potential ■ low potential

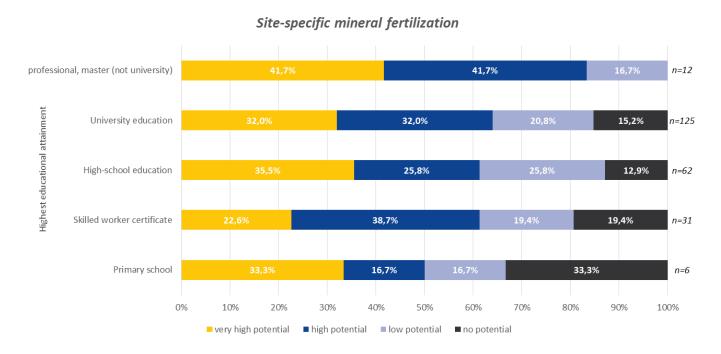


Figure 131: Survey results combined in total – Question 7.2 and Education





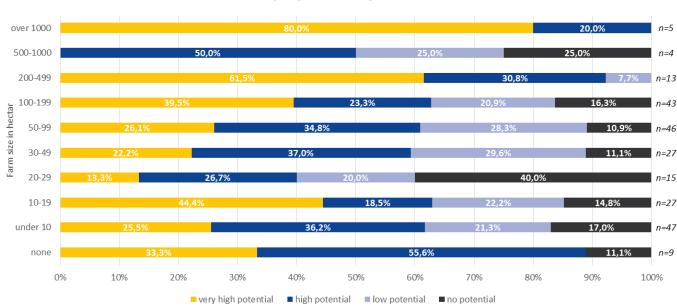


Figure 132: Survey results combined in total – Question 7.2 and Farm size

Mixed farm type (no.

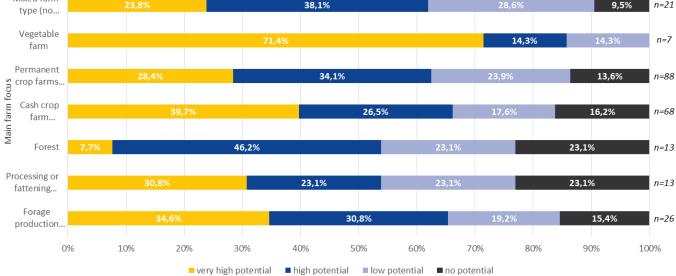


Figure 133: Survey results combined in total – Question 7.2 and Main farm focus





2.7.3. Site-specific tillage

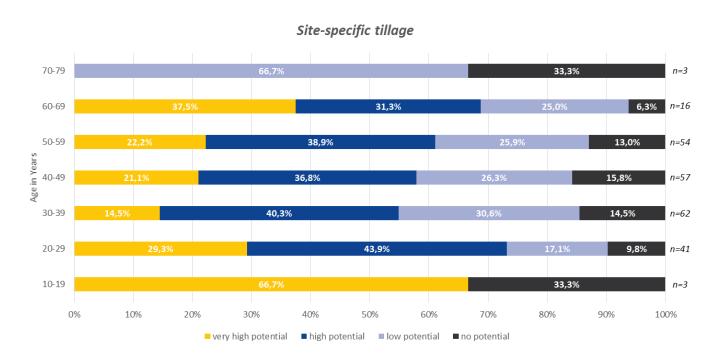


Figure 134: Survey results combined in total - Question 7.3 and Age

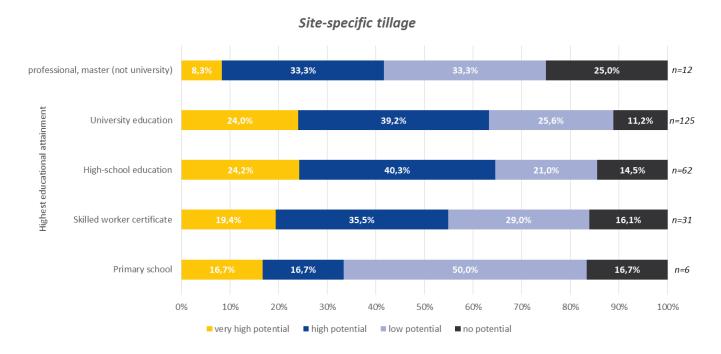


Figure 135: Survey results combined in total - Question 7.3 and Education





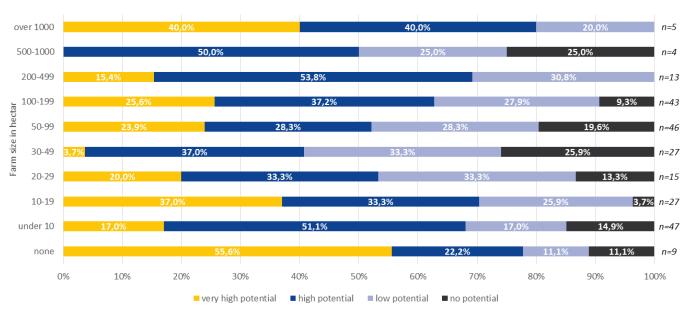


Figure 136: Survey results combined in total – Question 7.3 and Farm size

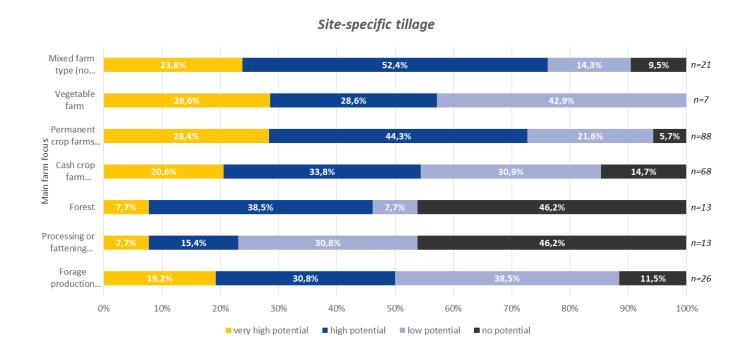


Figure 137: Survey results combined in total - Question 7.3 and Main farm focus





2.7.4. Site-specific sowing

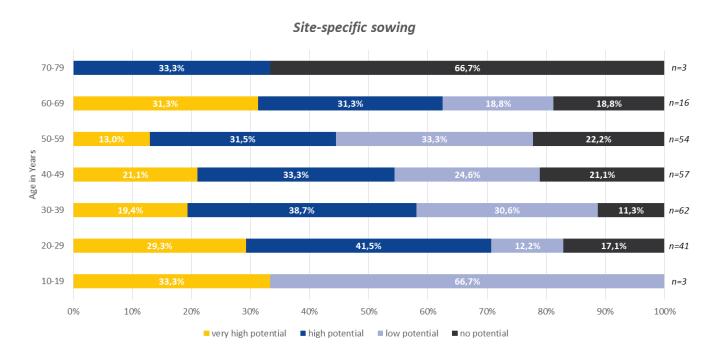


Figure 138: Survey results combined in total - Question 7.4 and Age

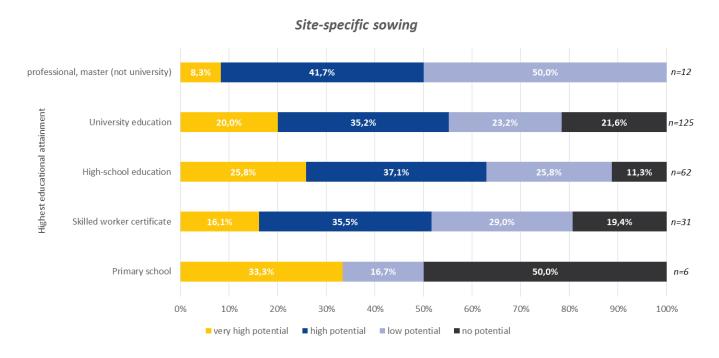


Figure 139: Survey results combined in total - Question 7.4 and Education



over 1000

500-1000

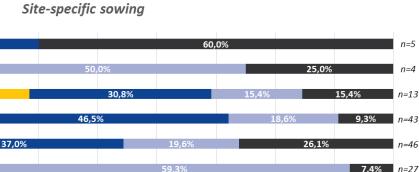
200-499 100-199

50-99

Farm size in hectar

n=5

n=4



30-49 **7,4**% n=27 20-29 n = 1.510-19 under 10 none n=9 0% 10% 20% 50% 60% 70% 80% 90% 100% 30% very high potential ■ high potential ■ low potential ■ no potential

Figure 140: Survey results combined in total – Question 7.4 and Farm size

20,0%

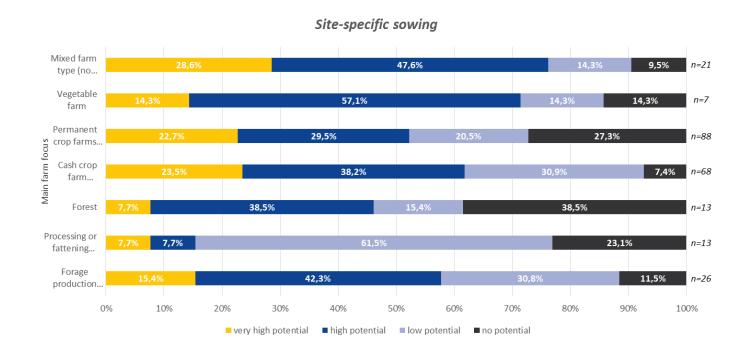


Figure 141: Survey results combined in total - Question 7.4 and Main farm focus





2.7.5. Site-specific chemical plant protection

Site-specific chemical plant protection 70-79 60-69 n=16 n=54 Age in Years 40-49 36,8% n = 5730-39 40,3% n=62 20-29 10-19 n=3 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Figure 142: Survey results combined in total – Question 7.5 and Age

■ high potential

low potential

very high potential

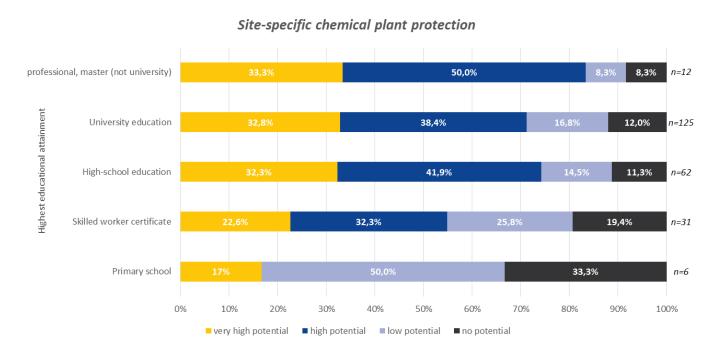


Figure 143: Survey results combined in total – Question 7.5 and Education





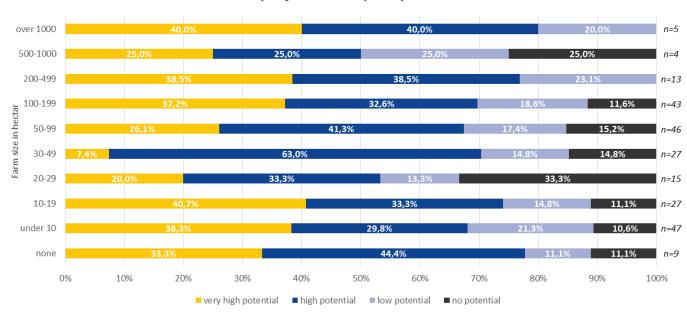


Figure 144: Survey results combined in total – Question 7.5 and Farm size

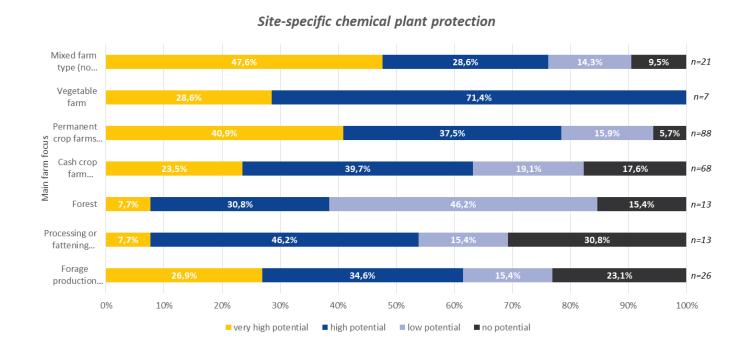


Figure 145: Survey results combined in total - Question 7.5 and Main farm focus



Age in Years

10-19

0%

10%

20%

30%

very high potential



2.7.6. Site-specific mechanical plant protection

Site-specific mechanical plant protection 70-79 33,3% 33,3% 33,3% 18,8% n=16 60-69 12,5% 50,0% 18,8% 18,8% n=16 50-59 22,2% 27,8% 29,6% 20,4% n=54 40-49 26,3% 33,3% 21,1% 19,3% n=57 30-39 22,6% 43,5% 24,2% 9,7% n=62 20-29 36,6% 26,8% 26,8% 9,8% n=41

50%

60%

low potential

70%

80%

90%

Figure 146: Survey results combined in total - Question 7.6 and Age

40%

■ high potential

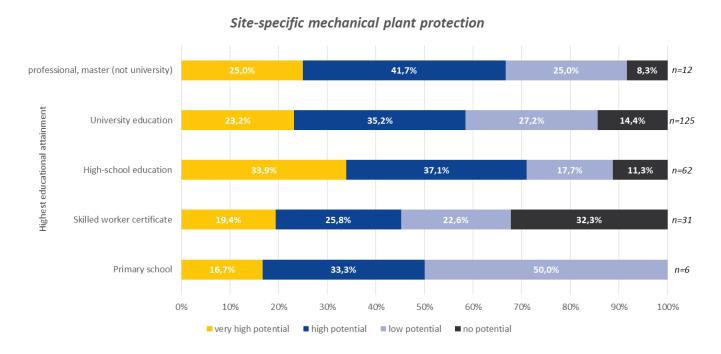


Figure 147: Survey results combined in total - Question 7.6 and Education

n=3

100%





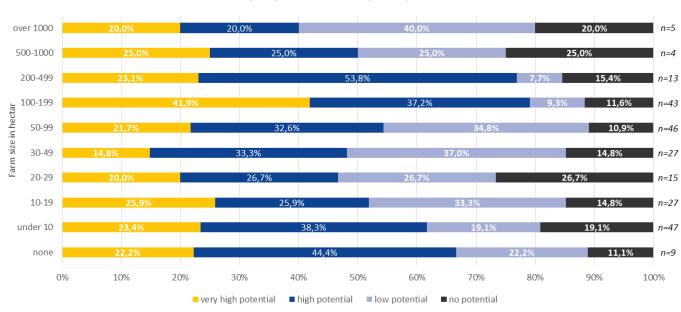


Figure 148: Survey results combined in total – Question 7.6 and Farm size

Site-specific mechanical plant protection

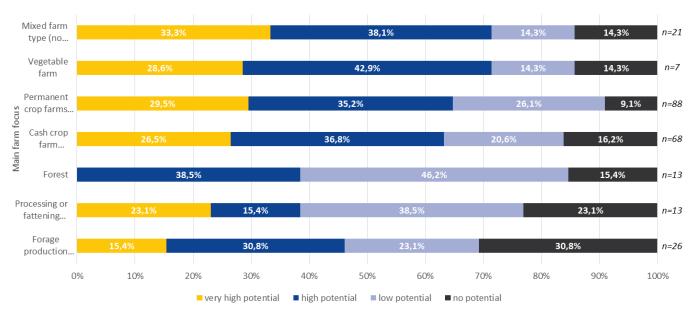


Figure 149: Survey results combined in total - Question 7.6 and Main farm focus





2.7.7. Adequate irrigation

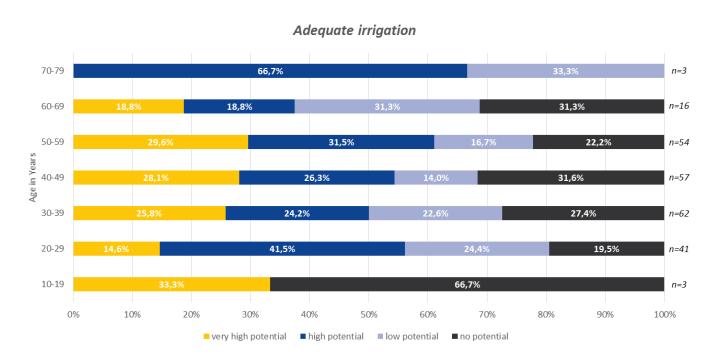


Figure 150: Survey results combined in total - Question 7.7 and Age

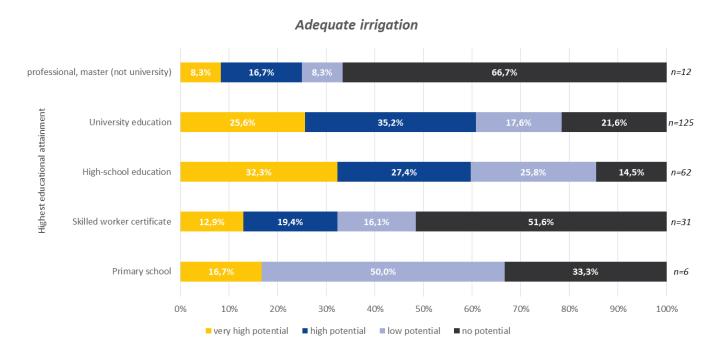


Figure 151: Survey results combined in total - Question 7.7 and Education



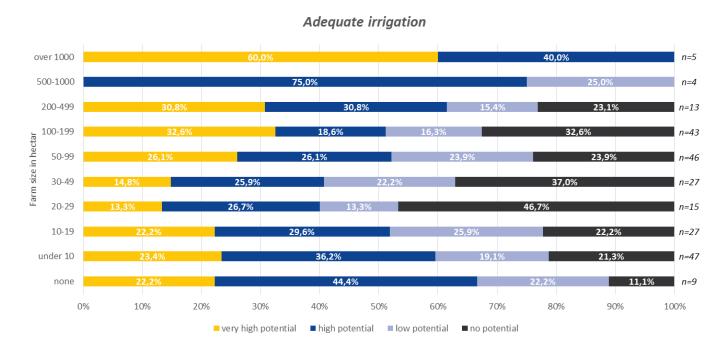


Figure 152: Survey results combined in total – Question 7.7 and Farm size

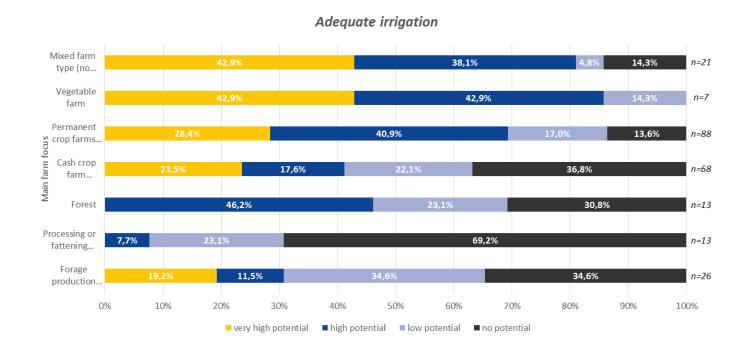


Figure 153: Survey results combined in total - Question 7.7 and Main farm focus





2.8. Question 8: How do you rate the following aspects in terms of their impact on better dissemination of PF technologies?

2.8.1. Site-specific Initial investment

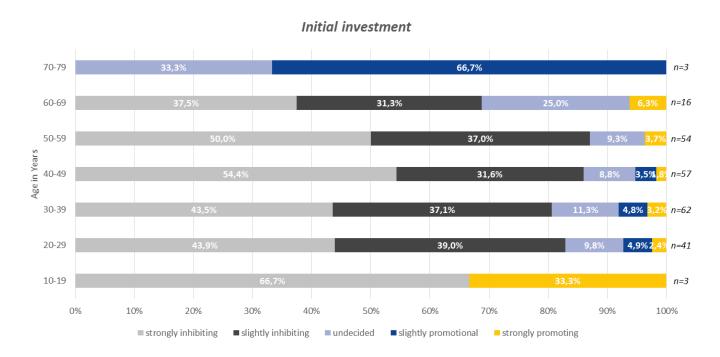


Figure 154: Survey results combined in total – Question 8.1 and Age

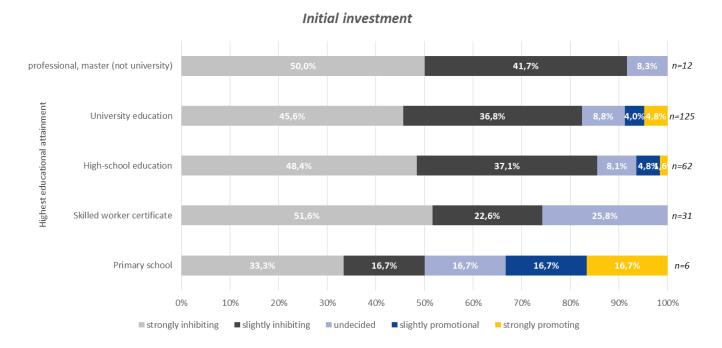


Figure 155: Survey results combined in total – Question 8.1 and Education



0%

10%

20%

strongly inhibiting

30%

■ slightly inhibiting

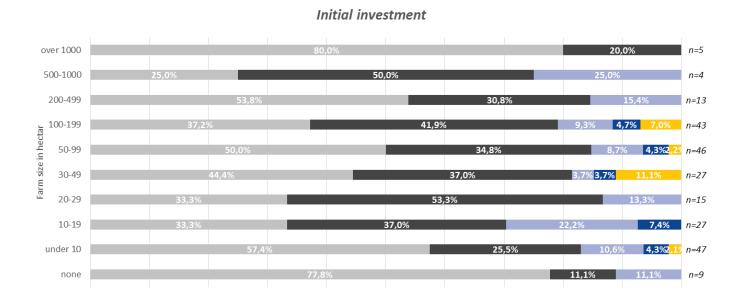
80%

strongly promoting

70%

90%

100%



50%

undecided

60%

■ slightly promotional

Figure 156: Survey results combined in total – Question 8.1 and Farm size

40%

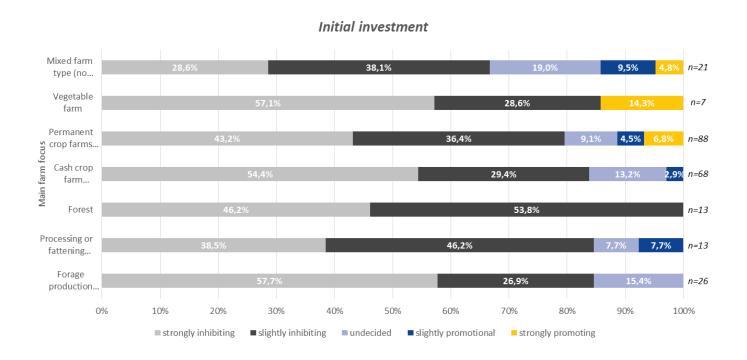


Figure 157: Survey results combined in total - Question 8.1 and Main farm focus





2.8.2. Compatibility of different systems

strongly inhibiting

Compatibility of different systems 70-79 n=3 60-69 n=16 50-59 n=54 Age in Years n=57 40-49 30-39 n=62 20-29 🤥 n=41 10-19 n=3 0% 10% 20% 50% 70% 90% 100% 30% 40% 60% 80%

undecided

■ slightly promotional

strongly promoting

Figure 158: Survey results combined in total - Question 8.2 and Age

■ slightly inhibiting

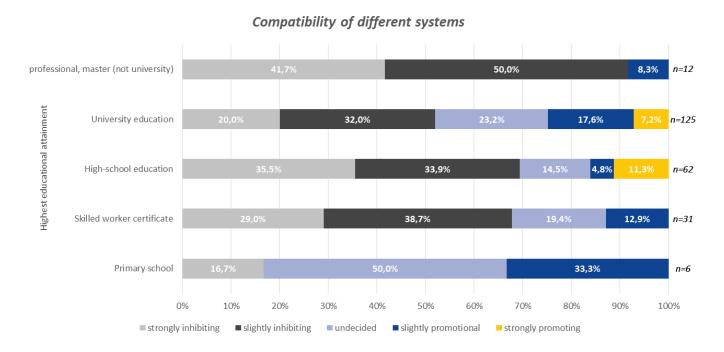


Figure 159: Survey results combined in total - Question 8.2 and Education





Compatibility of different systems

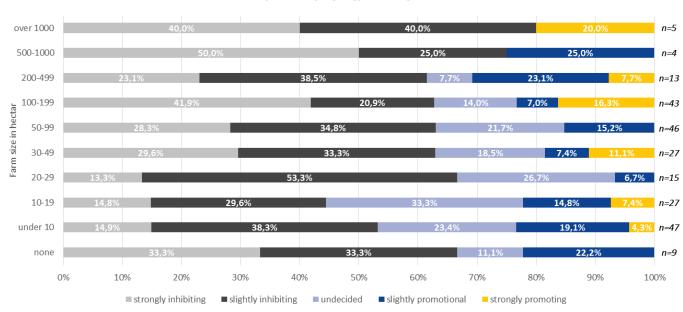


Figure 160: Survey results combined in total – Question 8.2 and Farm size

Mixed farm 14,3% type (no... Vegetable n=7 farm Permanent n=88 Cash crop farm... 10,3% n=68 Forest n=13 Processing or n=13 fattening... Forage n=26 production... 0% 20% 60% 100%

Compatibility of different systems

Figure 161: Survey results combined in total - Question 8.2 and Main farm focus

■ slightly promotional

■ slightly inhibiting ■ undecided

■ strongly inhibiting





2.8.3. Operation costs

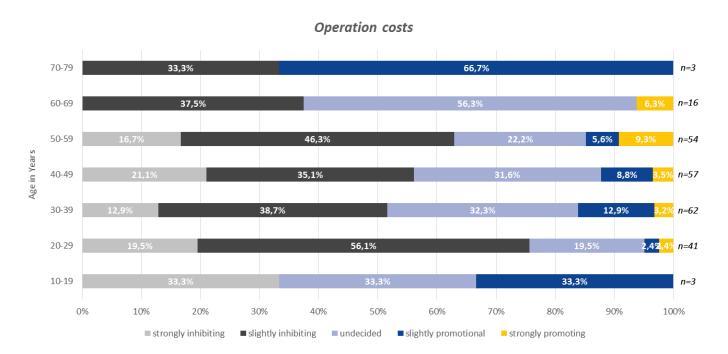


Figure 162: Survey results combined in total - Question 8.3 and Age

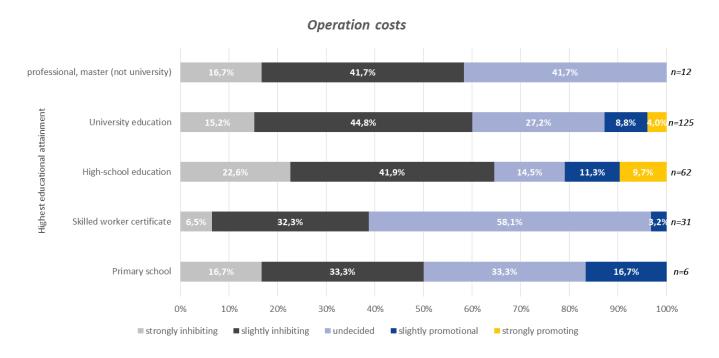


Figure 163: Survey results combined in total - Question 8.3 and Education





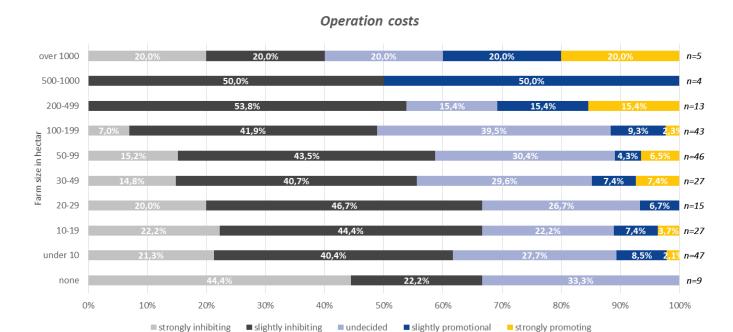


Figure 164: Survey results combined in total – Question 8.3 and Farm size

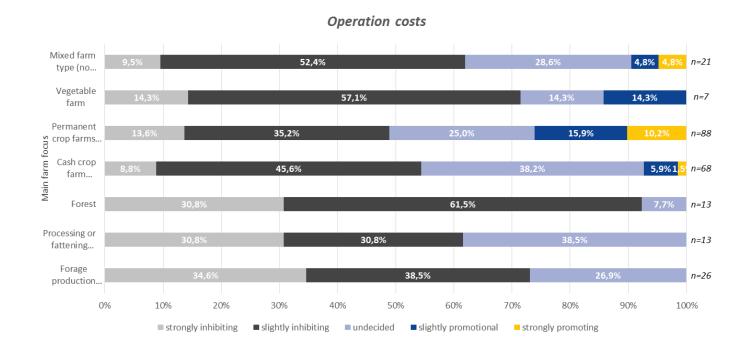


Figure 165: Survey results combined in total - Question 8.3 and Main farm focus





2.8.4. Manufacturer service

Manufacturer service 70-79 60-69 n=16 50-59 n=54 Age in Years 40-49 n=57 30-39 5 n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% strongly inhibiting ■ slightly inhibiting undecided ■ slightly promotional strongly promoting

Figure 166: Survey results combined in total - Question 8.4 and Age

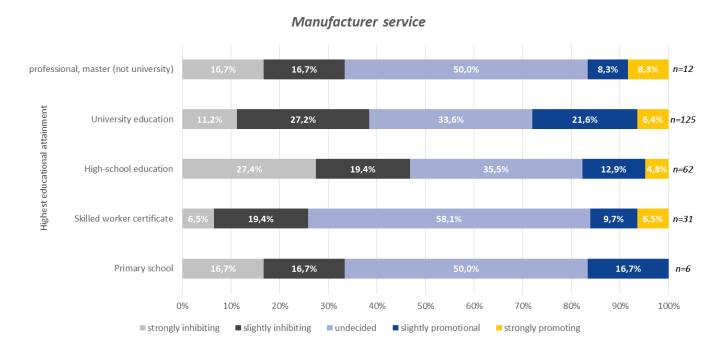


Figure 167: Survey results combined in total - Question 8.4 and Education





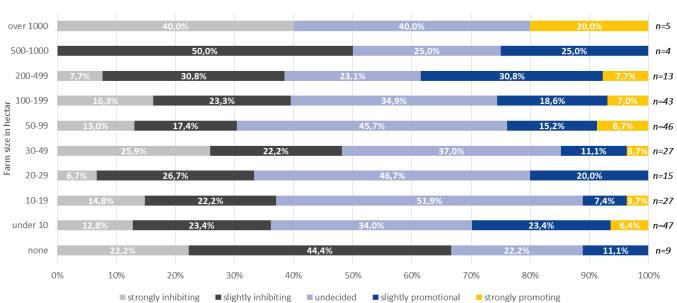


Figure 168: Survey results combined in total – Question 8.4 and Farm size

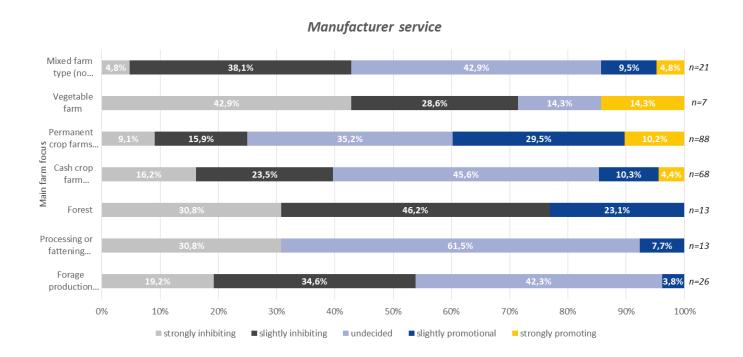


Figure 169: Survey results combined in total - Question 8.4 and Main farm focus





2.8.5. User-friendliness

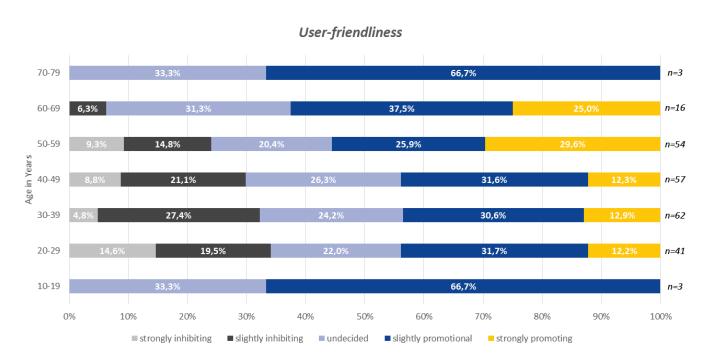


Figure 170: Survey results combined in total – Question 8.5 and Age

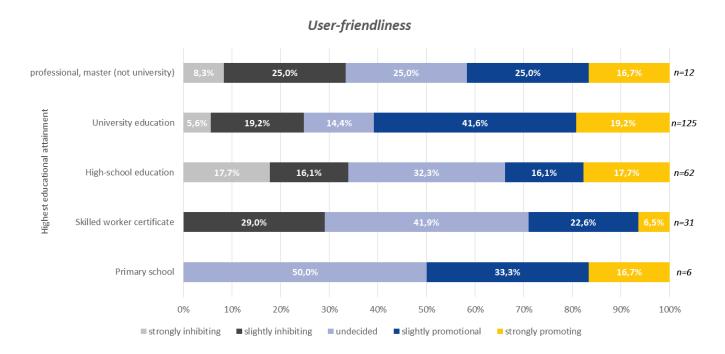


Figure 171: Survey results combined in total – Question 8.5 and Education



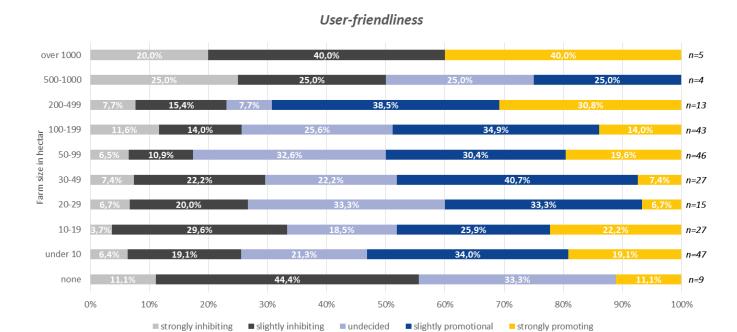


Figure 172: Survey results combined in total – Question 8.5 and Farm size

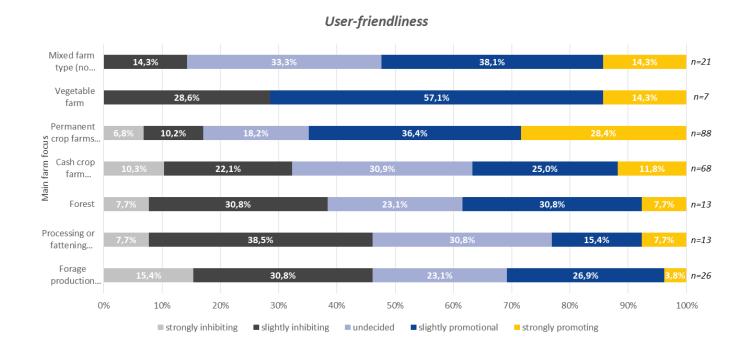


Figure 173: Survey results combined in total - Question 8.5 and Main farm focus





2.8.6. Reliability of the systems

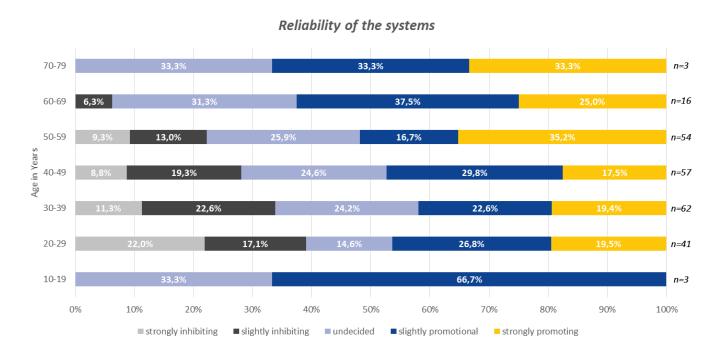


Figure 174: Survey results combined in total - Question 8.6 and Age

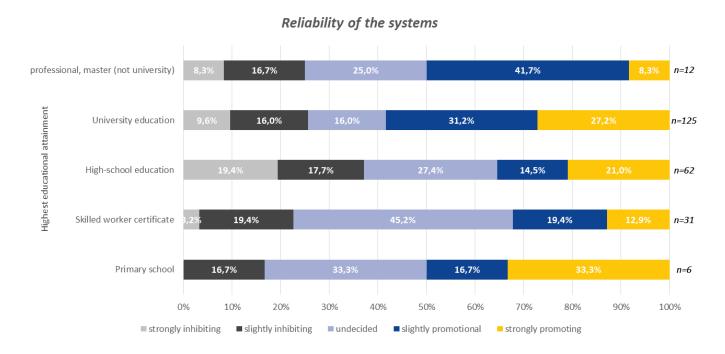


Figure 175: Survey results combined in total - Question 8.6 and Education





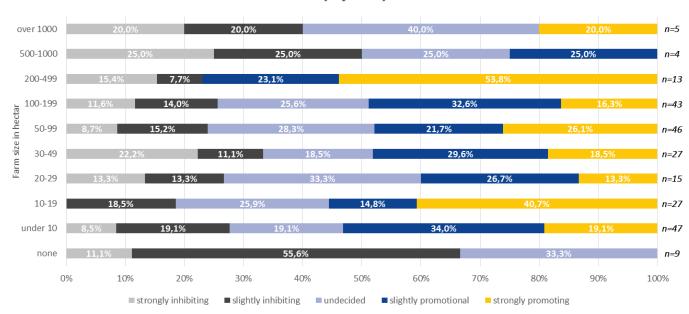


Figure 176: Survey results combined in total – Question 8.6 and Farm size

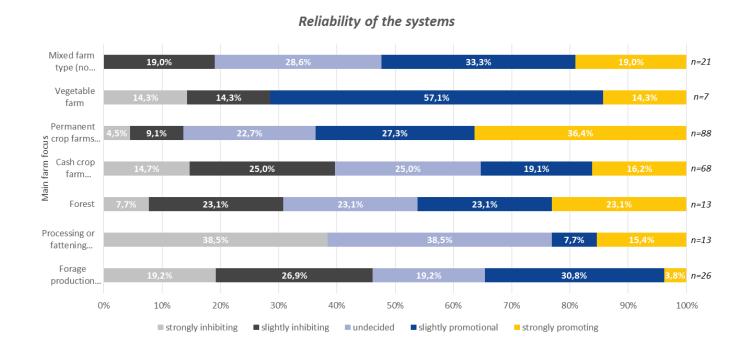


Figure 177: Survey results combined in total - Question 8.6 and Main farm focus





2.8.7. Data handling

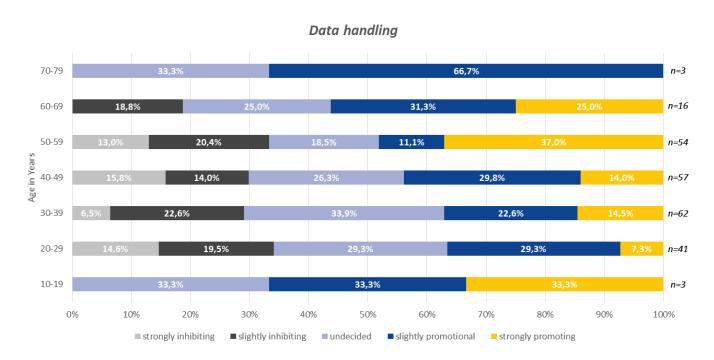


Figure 178: Survey results combined in total - Question 8.7 and Age

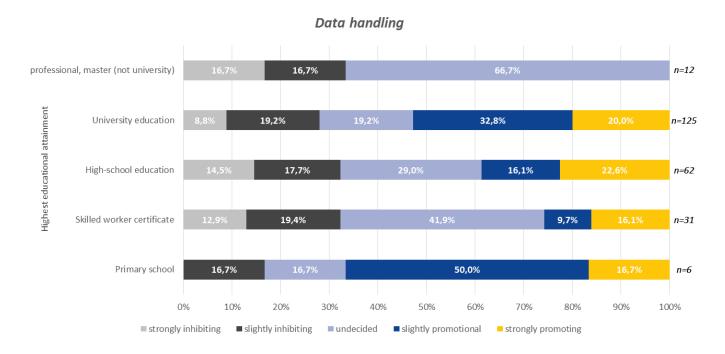


Figure 179: Survey results combined in total - Question 8.7 and Education





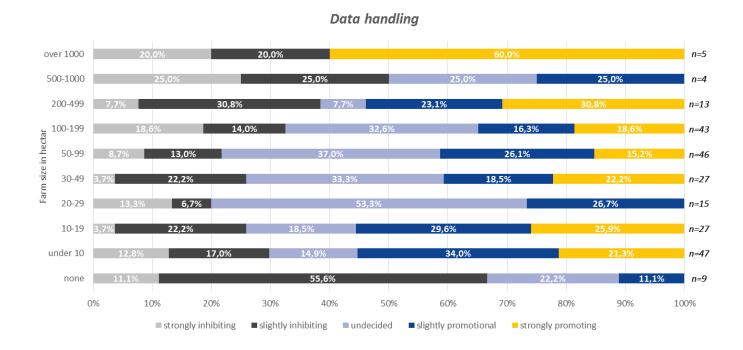


Figure 180: Survey results combined in total – Question 8.7 and Farm size

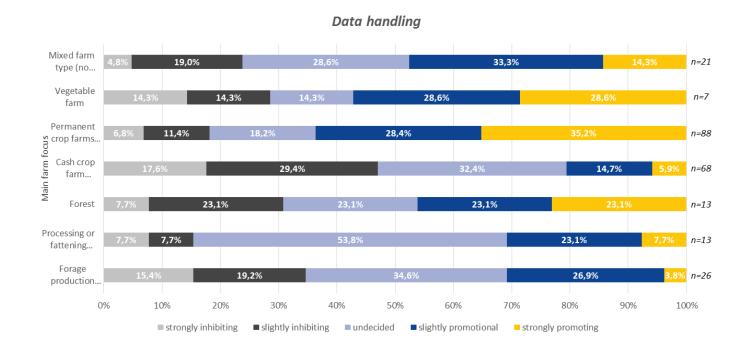


Figure 181: Survey results combined in total - Question 8.7 and Main farm focus





2.8.8. Traceability of working processes

strongly inhibiting

Traceability of working processes 70-79 n=3 60-69 n=16 n=54 Age in Years 40-49 38,6% n=5730-39 40,3% n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 50% 70% 80% 90% 100% 60%

undecided

■ slightly promotional

strongly promoting

Figure 182: Survey results combined in total - Question 8.8 and Age

■ slightly inhibiting

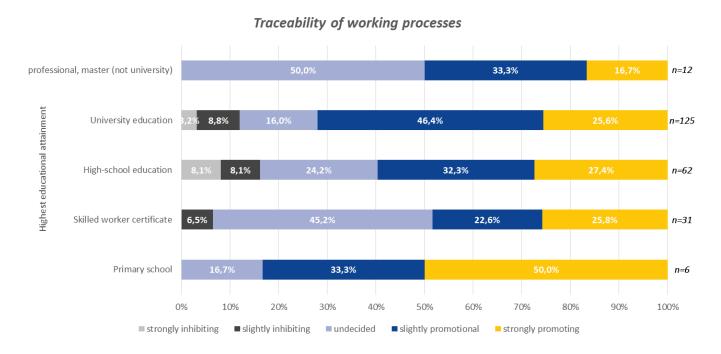


Figure 183: Survey results combined in total - Question 8.8 and Education



Forest

Processing or

fattening... Forage

production..

0%

■ strongly inhibiting



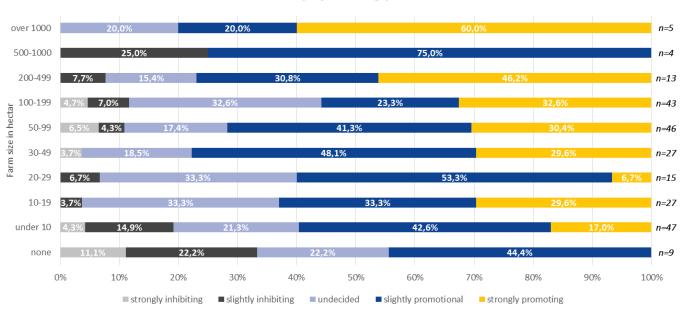


Figure 184: Survey results combined in total – Question 8.8 and Farm size

Mixed farm type (no... Vegetable 71,4% farm Permanent Cash crop farm...

Traceability of working processes

30,8%

■ slightly promotional

Figure 185: Survey results combined in total - Question 8.8 and Main farm focus

■ slightly inhibiting ■ undecided

n=21

n=7

n=88

n=68

n=13

n = 13

n=26

100%





2.8.9. Facilitation of documents

Facilitation of documents 70-79 60-69 n=16 50-59 29,6% n=54 Age in Years 40-49 n=5730-39 38,7% n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% strongly inhibiting ■ slightly inhibiting undecided ■ slightly promotional strongly promoting

Figure 186: Survey results combined in total - Question 8.9 and Age

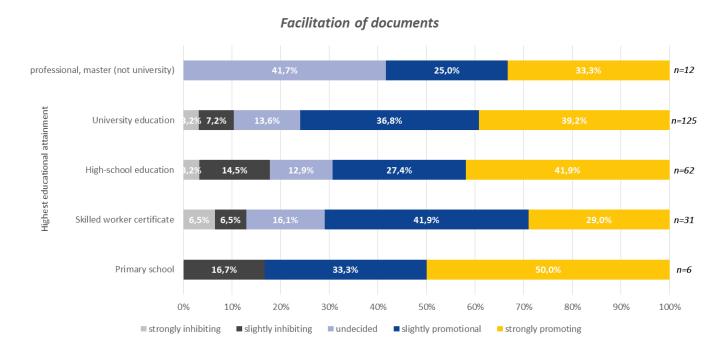


Figure 187: Survey results combined in total - Question 8.9 and Education





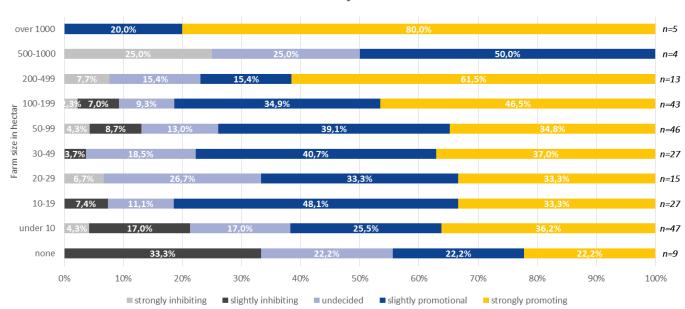


Figure 188: Survey results combined in total – Question 8.9 and Farm size

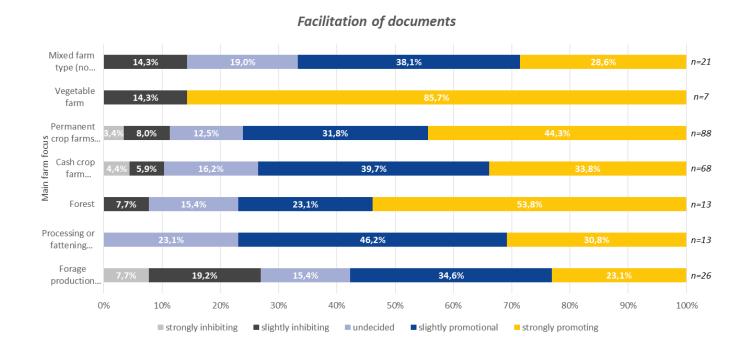


Figure 189: Survey results combined in total - Question 8.9 and Main farm focus





2.8.10. Improving the quality of work

strongly inhibiting

Improving the quality of work 70-79 66,7% n=3 60-69 n=16 n=54 Age in Years 40-49 n=5730-39 40,3% n=62 20-29 n=41 10-19 n=3 0% 10% 20% 30% 40% 50% 60% 70% 90% 100% 80%

undecided

■ slightly promotional

strongly promoting

Figure 190: Survey results combined in total – Question 8.10 and Age

■ slightly inhibiting

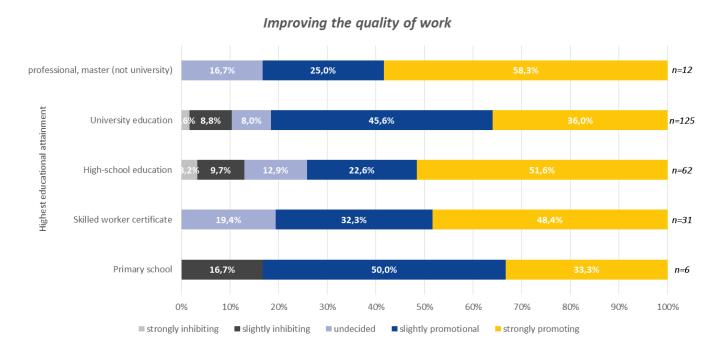
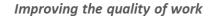


Figure 191: Survey results combined in total - Question 8.10 and Education





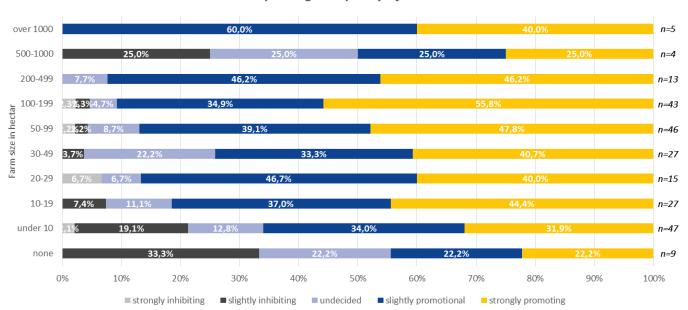


Figure 192: Survey results combined in total – Question 8.10 and Farm size

Improving the quality of work Mixed farm type (no... Vegetable n=7 farm Permanent n=88 Cash crop farm... 39,7% n=68 n=13 Processing or 46,2% n = 13fattening... Forage n=26 production... 0% 20% 90% 100% ■ strongly inhibiting ■ slightly inhibiting ■ undecided ■ slightly promotional

Figure 193: Survey results combined in total - Question 8.10 and Main farm focus





2.8.11. Reduced workload

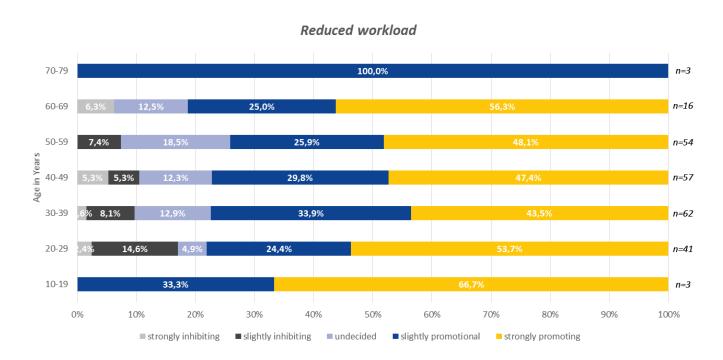


Figure 194: Survey results combined in total – Question 8.11 and Age

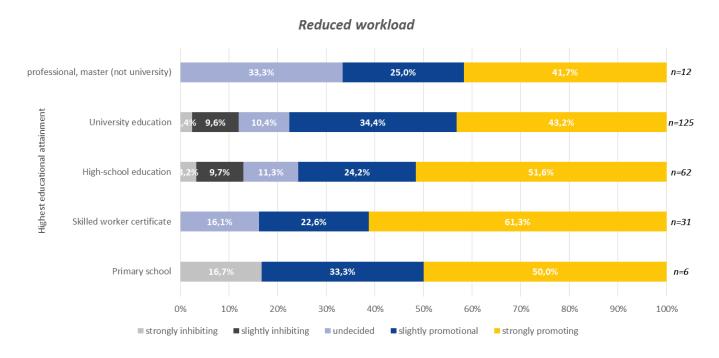


Figure 195: Survey results combined in total - Question 8.11 and Education



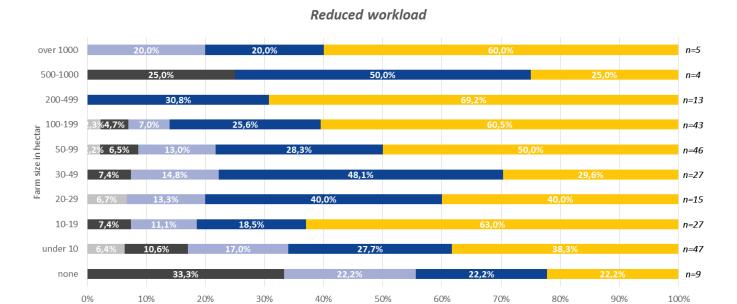


Figure 196: Survey results combined in total – Question 8.11 and Farm size

undecided

■ slightly promotional

■ slightly inhibiting

■ strongly inhibiting

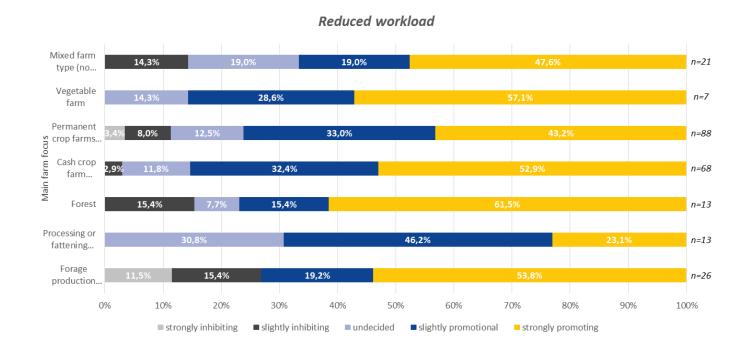


Figure 197: Survey results combined in total - Question 8.11 and Main farm focus





2.9. Question 9: For whom do you see more need for action to make PF technologies more widely accepted in practice? (multiple-response)

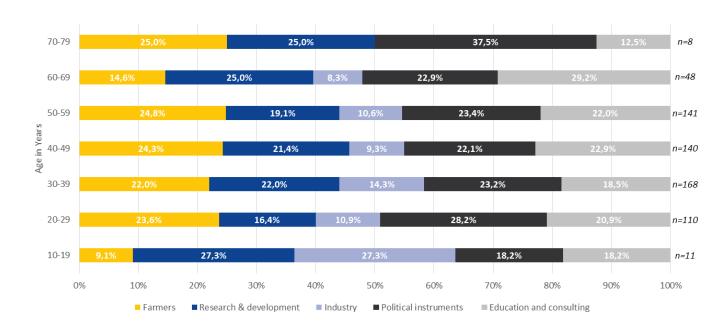


Figure 198: Survey results combined in total - Question 9 and Age

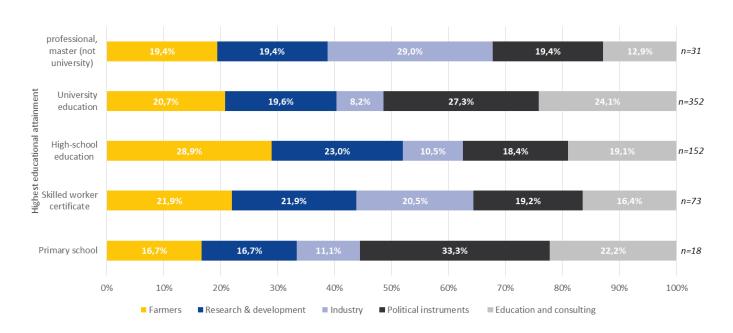


Figure 199: Survey results combined in total - Question 9 and Education



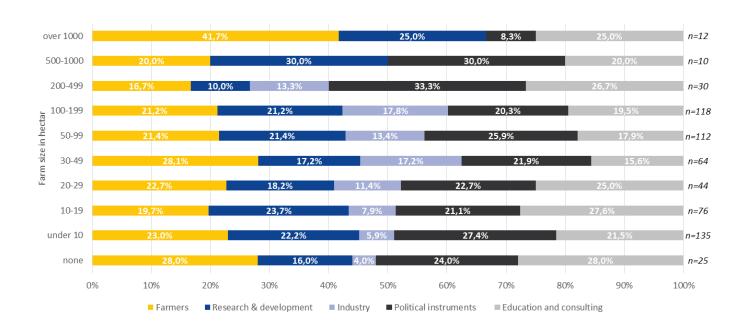


Figure 200: Survey results combined in total – Question 9 and Farm size

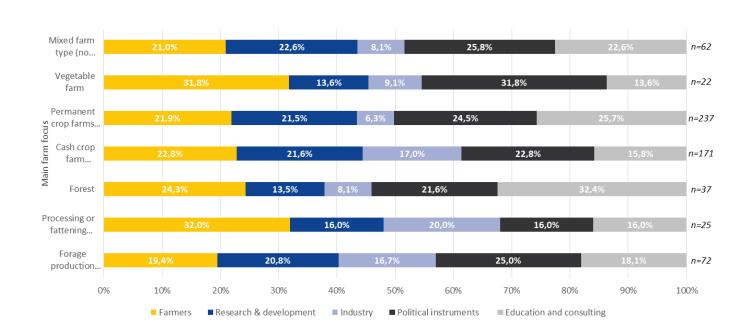


Figure 201: Survey results combined in total - Question 9 and Main farm focus





2.10. Question 10: In which way do you keep updated about PF and new PF equipment? (multiple-response)

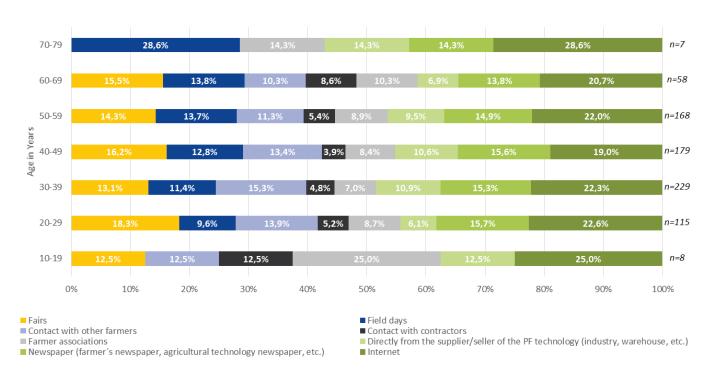


Figure 202: Survey results combined in total - Question 10 and Age

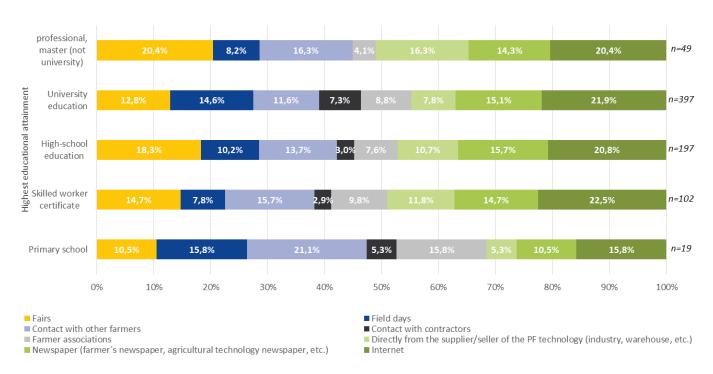


Figure 203: Survey results combined in total – Question 10 and Education



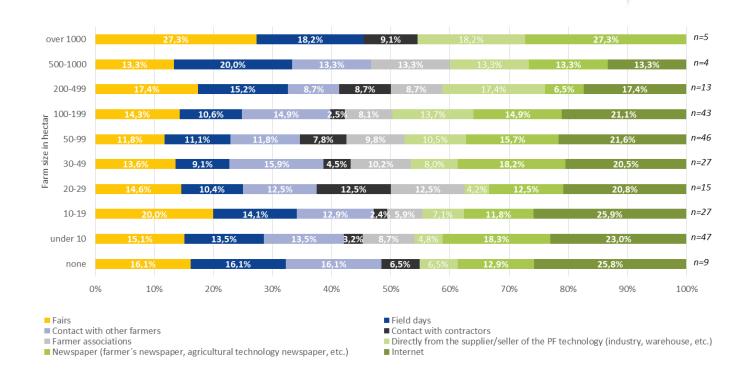


Figure 204: Survey results combined in total - Question 10 and Farm size

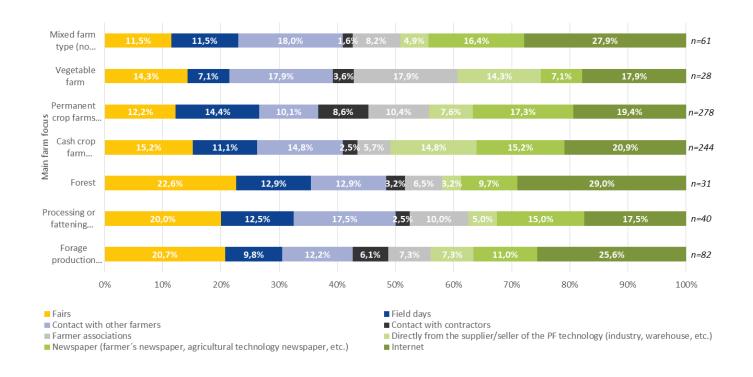


Figure 205: Survey results combined in total - Question 10 and Main farm focus





2.11. Question 11: Who do you currently contact for questions and needs in the field of PF? (multiple-response)

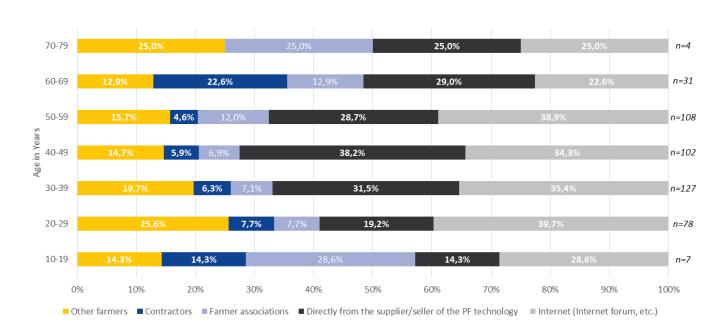


Figure 206: Survey results combined in total – Question 11 and Age

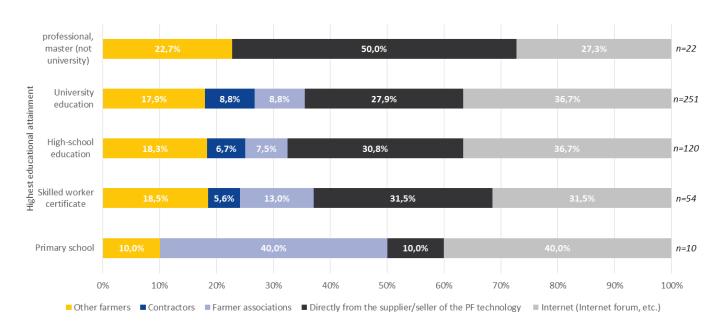


Figure 207: Survey results combined in total - Question 11 and Education



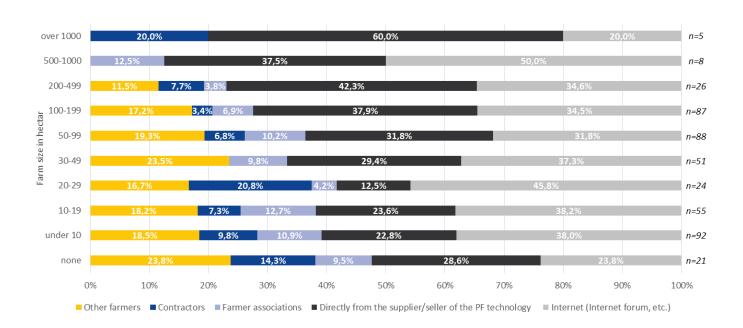


Figure 208: Survey results combined in total – Question 11 and Farm size

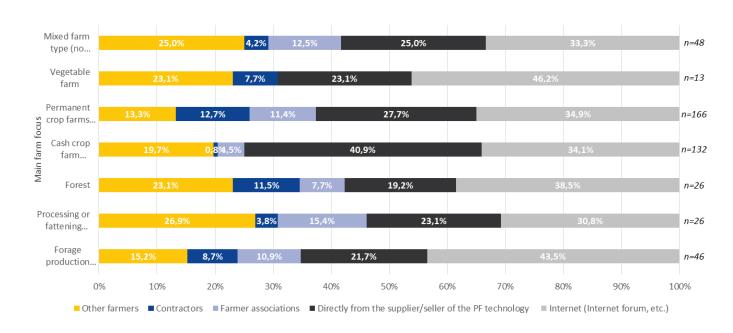


Figure 209: Survey results combined in total – Question 11 and Main farm focus





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