**Results Use Survey Malawi**

**General**

In May 2012, a total of 303 farmers in five districts have been surveyed for the Use Survey in Malawi. The number of surveyed farmers was approximately equal in Dedza, Dowa and Salima. In Ntcheu and Lilongwe districts, the sample sizes were smaller (Table 1). In all districts, more female than male farmers participated in the survey. Generally, few lead farmers participated in the survey. Except for Dedza, the majority of participating lead farmers were female. In all districts, female farmers formed a majority among the surveyed satellite farmers (Table 2). On average, female farmers were about seven years younger than male farmers. Lead farmers were about three years older than satellite farmers (data not shown).

Table 1. Overview of farmers participating in the use survey.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| District | No. of farmers | % lead | % satellite | % male | % female |
| Dedza | 83 | 18% | 81% | 41% | 57% |
| Dowa | 73 | 5% | 95% | 33% | 67% |
| Lilongwe | 29 | 24% | 76% | 38% | 62% |
| Ntcheu | 38 | 21% | 76% | 34% | 66% |
| Salima | 80 | 6% | 94% | 30% | 70% |
| *All districts* | *303* | *13%* | *86%* | *35%* | *64%* |

Table 2. Overview of lead and satellite farmers.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| District | No. of lead farmers | % male | % female | No. of satellite farmers | % male | % female |
| Dedza | 15 | 67% | 33% | 67 | 36% | 61% |
| Dowa | 4 | 25% | 75% | 69 | 33% | 67% |
| Lilongwe | 7 | 43% | 57% | 22 | 36% | 64% |
| Ntcheu | 8 | 38% | 63% | 29 | 34% | 66% |
| Salima  *All districts* | 5  *39* | 40%  *49%* | 60%  *51%* | 75  *262* | 29%  *33%* | 71%  *66%* |

The average farm size of surveyed farmers was 1.41 ha. With 1.89 ha, farmers in Salima generally had the largest farms. Farmers in Ntcheu, Dedza and Lilongwe had smaller farms, ranging from 1.08 ha to 1.14 ha (Figure 1). Lead farmers had larger farm sizes than satellite farmers. Although male farmers had on average larger farms than female farmers, the difference in farm size between being a lead or a satellite farmer was larger. In all cases, median farm sizes were smaller than average farm sizes, indicating that a few larger farms increased the average farm size.

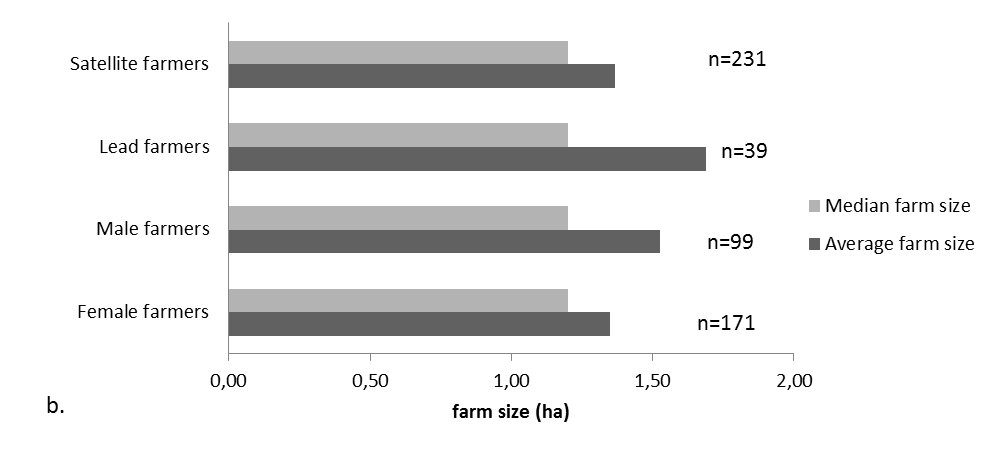
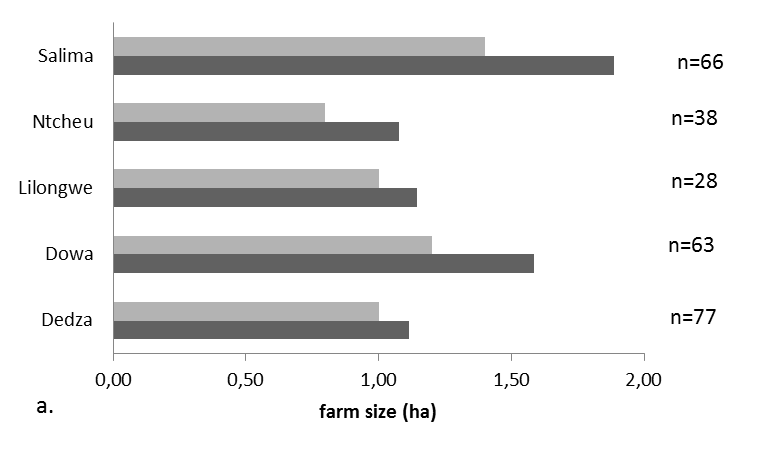


Figure 1. Average and median farm sizes per (a) district and (b) male/female farmers and lead/satellite farmers.

**Inputs received**

Although this is not the set-up of the project, almost all farmers indicated to have received an N2Africa package in both the 2010/2011 and the 2011/2012 season. 1% of the farmers in the 2010-2011 season and 8% of the farmers in the 2011-2012 season did not indicate to have received any package. In both seasons, soybean was the most commonly disseminated legume (Table 3). A few farmers indicated to have received multiple legumes in one season. 60% of all farmers receiving a package in 2011-2012 received the same crop as they had received before with their 2010-2011 package (data not shown).

Whereas 86% of the farmers indicated to have received fertilizer from N2Africa in the 2011-2012 season, only 55% indicated to have received fertilizer in the 2010-2011 season. This might be coincidence, or it might imply that farmers did not record receiving fertilizer from previous years. Although all soybean farmers were supposed to also receive inoculants, recorded receipt of inoculant was only 16% in 2010-2011 and 14% in 2011-2012.This issue is being investigated at the moment.

Sympal and NPK (32:21:0 + 4S) were the most commonly disseminated fertilizers. Compound D and TSP were also regularly disseminated and CAN only to a few farmers. Whereas fertilizer was provided with all crops, the majority of the inoculants were provided with soybean packages. In 2011-2012, according to farmers’ recording, 39% of the soybean packages, 6% of the groundnut packages and 1% of the common bean packages included inoculants. In the season before, 30% of the soybean packages, 17% of the cowpea packages, 3% of the common bean packages and 2% of the groundnut packages received by farmers included inoculants (data not shown, or included in table 3).

Table 3. Inputs received in the N2Africa package by the surveyed farmers.

|  |  |  |
| --- | --- | --- |
|  | 2010-2011 | 2011-2012 |
| Cowpea | 4% | 5% |
| Groundnut | 19% | 23% |
| Soybean | 49% | 37% |
| Common bean | 24% | 23% |
| Combination | 2% | 2% |
| No package | 1% | 8% |
| Unknown | 2% | 1% |
|  |  |  |
| Fertilizer | 55% | 86% |
| Inoculants | 16% | 14% |

**Legume cultivation**

*Areas and cropping systems*

Bambara nut, climbing beans and pigeon pea were cultivated by very few farmers; bambara nut and climbing beans only in Dowa and Lilongwe districts. Groundnut was the most popular legume, cultivated by the majority of farmers in all districts, but mostly in Lilongwe. The percentage of farmers cultivating common beans varied highly among districts from 75% in Dedza to 1% in Salima. Cowpea was grown by 20-24% of farmers in Lilongwe, Ntcheu and Salima and by 8% of farmers in Dedza and Dowa. Although more variable across districts, soybean seemed to be the second most popular legume in terms of numbers of farmers cultivating it. Soybean was most cultivated in Salima and least in Dedza (Table 4).

Table 4. Overview of farmers cultivating legumes, probably including the N2Africa plots.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| District | n | Bambara nut | Climbing Bean | Common bean | Cowpea | Groundnut | Pigeonpea | Soybean |
| Dedza | 83 | 0% | 0% | 75% | 8% | 66% | 1% | 36% |
| Dowa | 73 | 4% | 0% | 53% | 8% | 62% | 8% | 70% |
| Lilongwe | 29 | 7% | 3% | 34% | 24% | 86% | 3% | 52% |
| Ntcheu | 38 | 0% | 0% | 16% | 21% | 66% | 5% | 61% |
| Salima | 80 | 0% | 1% | 1% | 20% | 59% | 1% | 73% |

In Dedza, Dowa and Lilongwe, the average total area under legumes was around 0.47 ha per farm (Figure 2). With 0.23 ha per farm, farmers in Ntcheu cultivated the smallest legume areas. Looking at the share of legumes in the total cultivated area, farmers in Ntcheu and Salima both had 21% of their cultivated area allocated to legumes. Although farmers in Dedza, Dowa and Lilongwe had on average approximately equal legume areas, with 29% the share of legumes in the total cultivated area was smaller in Dowa (Table 5).

Satellite farmers had slightly larger legume areas than lead farmers and male farmers had larger legume areas than female farmers. Whereas the percentage of the cultivated area allocated to legumes remained approximately equal for male (31%) and female farmers (29%), satellite farmers allocated more land to legumes than lead farmers also in relative terms (31% vs. 23%) (data not shown).

Besides being the most popular legume in terms of the number of farmers cultivating it, groundnut also had the largest total average area compared to the other grain legumes (Figure 2). Although soybean was cultivated by more farmers than common bean, the total average area under soybean was not definitely larger than the area under common bean, implying that soybean was often cultivated on smaller plots (possibly N2Africa plots). Looking at both numbers of farmers cultivating it and the total average they comprise, bambara nut, climbing bean and pigeonpea only play a minor role in the farming systems in the surveyed areas. (Pigeon pea plays a more important role in the dryer South of Malawi.)

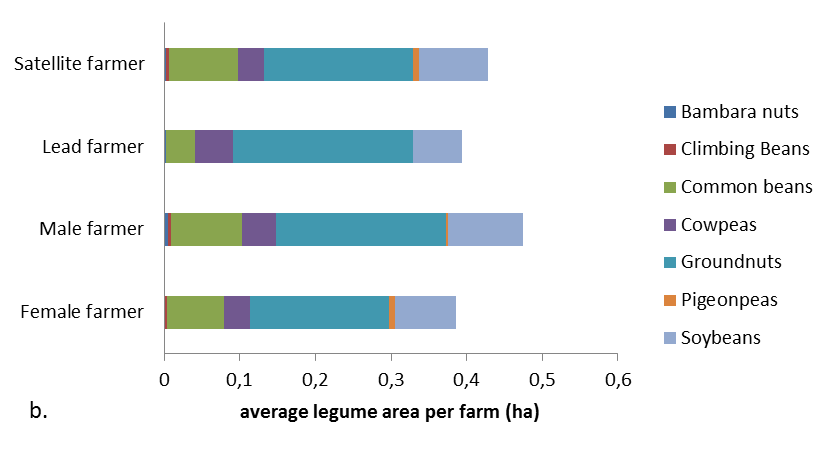
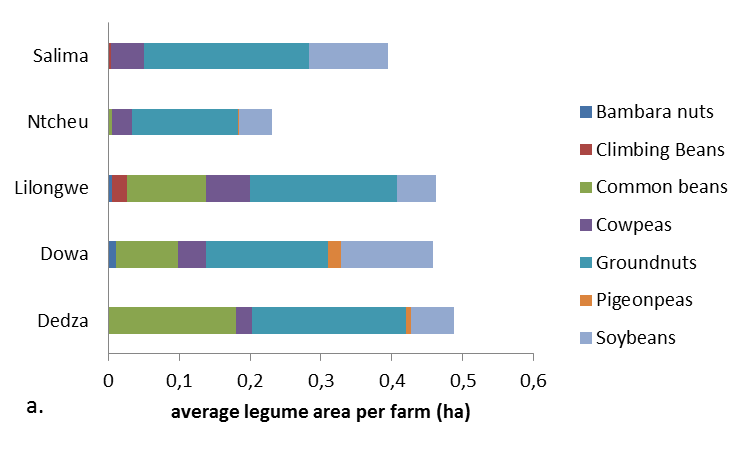


Figure 2. Average legume areas per farm, categorised per district (a) and per type of farmer (b). (16 cases where the sum of legume area was much larger than the indicated farm size were not included in the analysis.)

Table 5. Share of legumes in the cultivated area.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Dedza | Dowa | Lilongwe | Ntcheu | Salima |
| Share of legumes in farm | 44% | 29% | 40% | 21% | 21% |

The majority of farmers did not intercrop legumes with other crops. Less than 1/3 of the common bean and cowpea fields and only 6% of the groundnut and soybean fields were intercropped with other crops. When fields were intercropped, common beans, soybean and cowpea were usually accompanied by maize and sometimes by tobacco or groundnut. In addition, cowpea was also intercropped with cotton or soybean. Groundnut was often intercropped with beans, soybean, or maize. Intercropping practices differed spatially. Whereas 22% of the legume fields were intercropped in Dedza, in Salima this was only 2%.

Table 6. Number of legume fields and percentage of fields in which legumes are grown as intercrops and with which crops. Intercrops are given in order or frequency.

|  |  |  |  |
| --- | --- | --- | --- |
|  | n | % intercropped | With |
| Bambara nuts | 5 | 0% |  |
| Bush Beans | 5 | 60% | Maize, groundnut |
| Climbing Beans | 2 | 50% |  |
| Common beans | 135 | 29% | Maize, tobacco, groundnut |
| Cowpeas | 46 | 28% | Maize, cotton, soybean, groundnut, tobacco |
| Groundnuts | 229 | 6% | Beans, soybean, maize |
| Pigeonpeas | 11 | 55% | Maize |
| Soybeans | 203 | 6% | Maize, groundnut, tobacco |

Table 7. Percentage intercropped legume fields per district.

|  |  |  |
| --- | --- | --- |
|  | N | % legume fields intercropped |
| Dedza | 181 | 22% |
| Dowa | 166 | 14% |
| Lilongwe | 67 | 19% |
| Ntcheu | 77 | 9% |
| Salima | 145 | 2% |

*Inputs*

With 22% of the legume fields being inoculated, the highest rate of inoculation was found in Salima. In Dowa, only in 4% of legume fields inoculation was used. Synthetic fertilizer was used more often than organic fertilizer. The highest proportion of fields targeted with synthetic fertilizer was found in Ntcheu (56%), the lowest in Dowa (27%) (Table 8).

Looking at targeting inputs to different crops, inoculation was mainly used with soybean, and in very few cases with common beans, cowpea and groundnut. Inoculation of other crops could be erroneous data since inoculants were not provided or promoted by N2Africa for other crops than soybean. However, it might also be possible that farmers inoculated other legumes due to e.g. misunderstanding, sharing inoculants, using left overs on other crops, etc. Inoculation rates of soybean fields were a little lower than the percentage of farmers who had received a package with soybean and inoculants. However, field observations suggest that farmers very much like inoculants. Unfortunately, viable soybean inoculants are not available in Malawi.

Organic fertilizer was generally targeted equally, but rarely, to common beans, cowpea and soybean, even less to groundnut and pigeonpea and not at all to climbing beans and bambara nut. Whereas the majority of soybean fields (57%) were targeted with synthetic fertilizer, only 16% of the groundnut fields and even 0% of the Bambara nut fields received this nutrient input (Table 9).

On 60% of the fields additional N2Africa technologies were used. These numbers were somewhat higher in Dowa and Ntcheu and somewhat lower in Lilongwe. On soybean fields, generally more other N2Africa techniques were used than on fields with other legumes. These other techniques referred in the majority of cases to ‘how to plant’ and plant and/or row spacing.

Table 8. Use of inputs on legume fields, per district.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | n | Inoculants | Organic fertilizer | Synthetic fertilizer | Other N2A technology |
| Dedza | 181 | 6% | 10% | 46% | 55% |
| Dowa | 166 | 4% | 5% | 27% | 67% |
| Lilongwe | 67 | 15% | 12% | 31% | 40% |
| Ntcheu | 77 | 19% | 9% | 56% | 70% |
| Salima | 145 | 21% | 21% | 44% | 63% |
| *All districts* | *636* | *12%* | *11%* | *40%* | *60%* |

Table 9. Use of inputs on legume fields, per legume type.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | n | Inoculants | Organic fertilizr | Synthetic fertilizer | Other N2A technology |
| Bambara nuts | 5 | 0% | 0% | 0% | 20% |
| Climbing Beans | 2 | 0% | 0% | 50% | 0% |
| Common beans | 135 | 2% | 16% | 56% | 63% |
| Cowpeas | 46 | 2% | 15% | 43% | 52% |
| Groundnuts | 229 | 1% | 6% | 16% | 54% |
| Pigeonpeas | 11 | 0% | 9% | 55% | 55% |
| Soybeans | 203 | 33% | 14% | 57% | 69% |

Considering gender and role of the farmer in the previous season, there are some differences in use of technologies by farmers of these different groups. Although still few, satellite farmers seem to use organic fertilizer more often than Lead Farmers. On the other hand, Lead Farmers use synthetic fertilizer and other N2Africa techniques more often than Satellite Farmers. Male farmers use synthetic fertilizers more often than female farmers. However, the difference is small and male and female farmers do not score differently on the other categories. Use of inoculants did not seem to be affected by type of farmer.

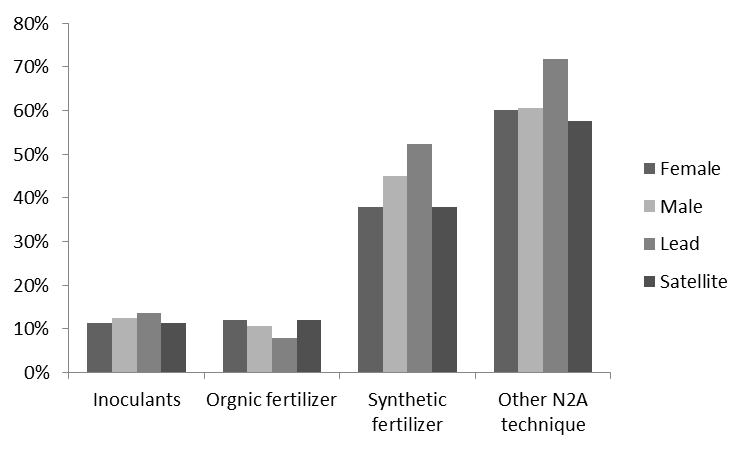


Figure 3. Percentages of Female, Male, Lead and Satellite farmers that applied a technique.

**Awareness and use of inoculants**

The majority of the farmers did have an opinion about root nodules; 30% of all farmers thought that they were beneficial, 18% did have no opinion and some farmers were not certain about root nodules. There were also a substantial number of farmers that thought root nodules were useless or even harmful, probably because Malawian farmers have been taught that root knot nematodes – which similarly result in round lumps on roots – are harmful, due to the long history of tobacco cultivation. Hence only those farmers who really understood and/or were properly informed about rhizobia nodules know the difference between these and root knot nematodes.

Table 10. Farmers’ opinion about root nodules.

|  |  |
| --- | --- |
| Opinion | % farmers |
| Blank | 20% |
| Beneficial | 30% |
| Harmful | 13% |
| No influence/impact | 3% |
| No opinion | 18% |
| Uncertain | 7% |
| Useless | 9% |

On average, 52% of the farmers indicated to have heard about inoculants. This percentage was substantially higher in Ntcheu and lower in Dedza (Table 11). Corresponding with awareness of inoculants, the highest proportion of farmers using inoculants was found in Ntcheu and the lowest proportion was found in Dedza. Soybean was the only crop inoculated by farmers. In this part if the survey, in general, 25% of all soybean farmers indicated to have used inoculants.

Table 11. Percentage of farmers that heard about inoculation and used inoculants on soybean.

|  |  |  |
| --- | --- | --- |
| District | Heard about inoculation | Used inoculants |
| Dedza | 36% | 11% |
| Dowa | 52% | 23% |
| Lilongwe | 55% | 28% |
| Ntcheu | 74% | 39% |
| Salima  *All districts* | 56%  *52%* | 34%  *25%* |

Of the 76 farmers who indicated to have used inoculants, the majority received the inoculants from the project. Some farmers used inoculants that were given to them by other farmers (Dowa and Salima), and some used inoculants from the previous year (Ntcheu). Very few farmers bought it from an agro-dealer or shop (Ntcheu). It was not clear whether the inoculants originating from Chitedze research station were bought there by the farmers themselves or provided through the project.

However, the data show that 20% of the farmers who received a package with inoculants did not use it. On the other hand, 13% of the farmers who did not indicate to have received inoculants indicated that they inoculated seeds. In addition, there were 10 farmers who received inoculants the previous season but not the current season. 29% of them still inoculated seeds (data not shown). This percentage is higher than that of farmers who had never received a package with inoculants.

Table 12. Origin of used inoculants.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Origin | Average | Dedza | Dowa | Lilongwe | Ntcheu | Salima |
| *n* | *76* | *9* | *17* | *8* | *15* | *27* |
| Blank | 8% | 11% | 18% |  |  | 7% |
| Bought from agro-dealer/shop | 1% |  |  |  | 7% |  |
| Chitedze research station | 13% |  |  | 25% | 20% | 19% |
| Donated by project | 67% | 89% | 76% | 75% | 53% | 59% |
| From government | 1% |  |  |  |  | 4% |
| Given by fellow farmers | 5% |  | 6% |  |  | 11% |
| Previous season | 4% |  |  |  | 20% |  |

34% of the farmers that used inoculants had them stored at their farms, usually in a cool place, e.g. on wet sand or a wet sac. One farmer stored them in the refrigerator. However, there were a few farmers who stored their inoculants in a particular warm place, e.g. on warm sand (Lilongwe) or covered with warm glass (Salima). Others did not store them in a particularly warm or cool place. 97% of the farmers that gave an indication about how long the inoculant was stored, used it within one month. The other 3% used it between one and two months of storage (data not shown).

Table 13. Storing methods of inoculants used by farmers.

|  |  |
| --- | --- |
| Storing methods | % farmers |
| Covered with warm glass | 4% |
| Dry sand and warm cloth | 4% |
| In a cupboard | 4% |
| In a plastic bag (in the house, attached to pot) | 11% |
| On wet and cool sand/sac/cloth/place | 71% |
| Kept in a carton in the house | 4% |
| Refrigerator | 4% |

80% of the farmers used an adhesive (sugar) for mixing the inoculants with the seeds. The highest percentage of farmers who did not use adhesive was found in Dedza (40%). In the other districts, farmers that did not use adhesive varied between 13 and 25 % (data not shown). After mixing the inoculants with the seeds, the majority of the farmers planted immediately. Some planted later that day, and very few planted the next day.

Table 14. Planting time of farmers after mixing the inoculants with the seeds.

|  |  |
| --- | --- |
| Time after mixing | % farmers |
| Planted immediately | 74% |
| One to two hours | 14% |
| Two to four hours | 4% |
| More than 6 hours same day | 4% |
| Planted next day | 4% |

Comments from farmers on the growth of inoculated soybean were various. Most of the farmers indicated that soybean grew better or had a higher yield with inoculation. Some farmers thought that inoculation protects the seeds from diseases, others thought the crop did become disease resistant in general or due to strong leaves in particular. One farmer mentioned that more nodules were formed with inoculation. A few farmers mentioned that they did not observe any change, or that the crop did not grow as expected due to too much sunlight, referring to drought impact.

Table 15. Farmers’ comments on the question whether inoculation affected (soybean) growth.

|  |  |
| --- | --- |
| Comment | % farmers giving the comment (n=46) |
| Inoculated Soybeans grows well/has strong leaves | 37% |
| High yield/increase productivity | 24% |
| Disease resistant (due to strong leaves) | 9% |
| It acted as fertilizer (and led to high yield) | 4% |
| It helps in nitrogen fixation | 4% |
| Did not do as expected because of (too much) sunlight | 4% |
| Protect seed from diseases | 4% |
| There was no change | 4% |
| It results into quality Soybeans | 2% |
| It speeds up germination | 2% |
| The plant produced more nodules | 2% |
| Did well but climate changes affected them | 2% |

The majority of farmers who gave a reason why they did not use inoculants indicated that this was because they did not receive inoculants. Others mentioned that they were not growing soybeans (and probably therefore did not receive inoculants). A smaller percentage of farmers mentioned lack of money as a reason. Of the farmers that were supposed to have received an input package with inoculants but indicated they did not use them, three said that had not received inoculants and gave that as the reason for not using them. The others did not give a reason.

Table 16. Farmers’ reasons for not using inoculants.

|  |  |
| --- | --- |
| Reason for not using inoculants | % farmers mentioning this reason (n=89) |
| Did not receive the inoculants | 46% |
| Not growing soybeans/Inoculants are only for soybeans | 21% |
| Not available in the area/was not available | 12% |
| Lack of money to buy the inoculants | 7% |
| Lack of knowledge about the inoculant/did not know about it | 3% |
| Did not access the inoculant at the right time/inoculant came late | 3% |
| Too dry when accessing/receiving the inoculants | 2% |
| Laziness/lot of work | 2% |
| Doesn't have a partner for this season | 1% |
| Difficult to access | 1% |

**Reasons for adoption**

From the data it was not clear which farmers had really adopted a technology, since most farmers had received N2Africa input packages in both seasons. However, the data were valuable to evaluate farmers’ opinions about different techniques and varieties. The majority of farmers indicated that, for all crops, a reason for using fertilizer is higher yields. Although a smaller proportion, for inoculation (of soybean), a majority also indicated that yields would be higher. However, using these techniques would not save labour according to the farmers nor would it have any effect on grain quality and taste of the grain.

Although improved plant and row spacing increased yield according to 80% of the farmers, no-one thought it saved labour. However, only 10 farmers mentioned these practises in this part of the questionnaire.

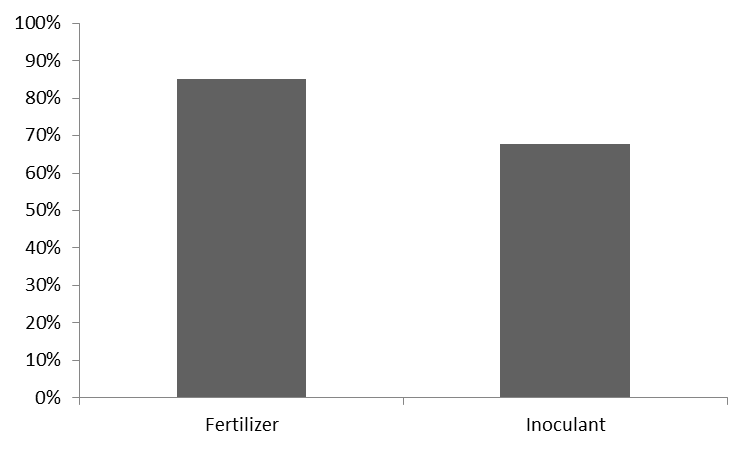


Figure 4. Proportion of farmers giving increased yields as a reason for using fertilizer and inoculants.

Farmers evaluated legumes and different varieties in terms of yield, grain quality, market demands, taste and easiness of cooking. Proportionally more farmers valued cowpea for having high yields than they did with common beans, groundnut or soybean. Although cultivated by fewer farmers than Sudan, the local cowpea variety scored higher on having better yields and good grain quality.

Many farmers recognized and appreciated better yield in the different bean varieties. The majority of the common bean farmers used the variety Kholophete. This variety scored highest on yield, but not on grain quality. Variety Napilira was valued by some farmers for its better taste. According to the farmers, both most of the different common bean and cowpea varieties did not have particular market demands and were not easier to cook than others.

The most commonly grown groundnut variety was CG7. Although not many farmers indicated especially good grain quality for all groundnut varieties, CG 7 still scored highest. However, Chalimbana was valued higher with respect to its yield and market demand.

Makwacha was the most grown soybean variety. However, Solitaire was more highly valued with respect to its yield.

Table 17. Farmers’ opinion about common (bush) bean, cowpea, groundnut and soybean in general and about different varieties of these legumes. Percentages are based on the total number of respondents and reflect numbers of farmers who agreed with the statement. Varieties which were cultivated by very few farmers were not included in this table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Crop | Variety | No. Of respondents | Better yield | Grain quality | Demand from markets | Better taste | Easier cooking |
| Common bean | - | 111 | 76% | 24% | 6% | 8% | 0% |
| Common bean | Kholophete | 40 | 80% | 30% | 5% | 5% | 0% |
| Common bean | Napilira | 21 | 57% | 33% | 5% | 19% | 0% |
| Common bean | Maluwa | 16 | 75% | 25% | 6% | 13% | 0% |
| Common bean | Nanyati | 9 | 67% | 33% | 11% | 11% | 0% |
| Common bean | Kalima | 8 | 50% | 38% | 0% | 0% | 0% |
|  |  |  |  |  |  |  |  |
| Cowpea | - | 33 | 85% | 21% | 6% | 9% | 0% |
| Cowpea | Sudan | 14 | 79% | 14% | 14% | 0% | 0% |
| Cowpea | Local | 3 | 100% | 67% | 0% | 0% | 0% |
|  |  |  |  |  |  |  |  |
| Groundnut | - | 176 | 77% | 23% | 10% | 6% | 1% |
| Groundnut | CG 7 | 88 | 66% | 31% | 11% | 5% | 0% |
| Groundnut | Nsinjiro | 56 | 79% | 18% | 7% | 9% | 2% |
| Groundnut | Chalimbana | 11 | 91% | 9% | 27% | 0% | 0% |
|  |  |  |  |  |  |  |  |
| Soybean | - | 190 | 70% | 25% | 11% | 8% | 1% |
| Soybean | Makwacha | 86 | 79% | 29% | 6% | 6% | 0% |
| Soybean | Nasoko | 44 | 70% | 25% | 9% | 2% | 0% |
| Soybean | Solitaire | 7 | 100% | 0% | 14% | 0% | 0% |

The majority of farmers who did not use a technology gave reasons for not doing so. The main reason for not using fertilizer or inoculants was unavailability of the product, followed by it being too expensive. Not using specific bush bean, groundnut or soybean varieties was caused by a combination of unavailability of the particular varieties and farmers thinking that those varieties are not particularly better yielding.

Table 18. Reasons for not using a technology. Percentages represent the number of farmers who indicated that reason for not using a technology.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | N | Not available | Too expensive | No yield response | Other1 | No answer |
| Fertilizer | 139 | 47% | 36% | 6% | 1% | 11% |
| Inoculant | 50 | 62% | 26% | 0% | 0% | 12% |
| Bush bean varieties | 5 | 40% | 0% | 40% | 0% | 20% |
| Groundnut varieties | 22 | 32% | 9% | 45% | 5% | 9% |
| Soybean varieties | 22 | 50% | 5% | 32% | 5% | 9% |

1 Other includes ‘too much labour’, ‘no market’, ‘not liked in the households’ and ‘attracts insects’.

**Conclusions**

Determining which N2Africa technologies are likely to be adopted was not possible from the data obtained from this survey, because the majority of farmers received a package in both the previous season and the survey season. However, the data gave some insights in legume cultivation and farmers’ opinions about different techniques and varieties.

All farmers who participated in this survey cultivated legumes, on an average of 0.41 ha per farm or 30% of the farm area (since sample sizes for districts were not equal, this was calculated as average from averages from district, rather than an average of the total sample). However, there were regional differences and probably also the N2africa test-plots were included. Groundnut was the most popular legume, both in terms of number of farmers growing it and the area it was grown on. Farmers used organic fertilizers only on a small part of the legume fields. Synthetic fertilizers were used more often, with the exception of groundnuts. For many years, government extension services have discouraged farmers from using fertilizer on groundnuts. In general, the majority of farmers thought that using fertilizer increases yield. Although the majority of farmers also thought that inoculation increases yields, it was used only by a small proportion of farmers. The main reason for not using inoculants was that farmers did not receive it from the project (and probably that it is not available otherwise). Many farmers practiced other N2Africa techniques such as row and plant spacing. Although they thought this did increase yields, it did not save labour.

Although it was not possible to distinguish for all techniques whether farmers practiced any particular one because they had received a N2Africa package (including training) or that they already practiced it ‘themselves’, some information on for example inoculation could be distilled from comparing the content of a package and farmers’ practice. There were some farmers who did not receive inoculants in the package, but nevertheless inoculated their soybean. However, there were also farmers who received inoculants but did not seem to have used it. 29% of the farmers who received inoculants the previous season but not the current season still continued inoculating soybean. Although this is based on a small number of farmers, this is more than twice as high as the percentage of farmers that inoculate without ever having receiving inoculants in a package (13%). However, it could be possible that farmers did not give correct responses regarding the content of their received package(s). Therefore, no conclusions can be drawn from these observations.