

EVALUATION OF SOYBEAN CULTIVATION PRACTICES IN EGYPT



OBJECTIVE OF THE STUDY

Despite initiatives undertaken by some national and international organizations towards creating an enabling environment for soybean smallholders, most of such initiatives have been deficient in evaluating proper and improper current farming practices, which could have contributed to further reforming of this cultivation. Therefore, CARE International adopted the idea of preparing a study to measure and evaluate practices of soybean cultivation in the governorates of Minya, Beni Suef and Dakahliya, focusing on the following:

- Clean agriculture practices.
- Increasing protein and oil practices.
- Lean production practices.
- Post-harvest soybean trading practices.
- Storage of soybean.
- Green grain reduction practices.
- Quality of irrigation.
- Using high-value production inputs.
- Agricultural Agenda



By using criteria and indicators of the reality and specificity of the soybean sector in Egypt, helping monitor and measure the form and degree of practices in order to identify problems, in such practices, suffered by smallholders and to find solutions that best suit them.



METHODOLOGY

CARE International followed the following methodology in the preparation of such evaluation: 1) reviewing, international and local principles and frameworks on best practices of soybean cultivation; 2) focusing on understanding and studying nine types of practices in the soybean cultivation sector, in view of the multiplicity of good agricultural practices and with a view to producing specific and tangible outcomes; 3) formulating an integrated matrix consisting of types of practices including sub-practices which in turn are divided into a set of indicators reflected in the form of sub-indicators that are measured directly from the data collected from the field; 5) preparing the form of "Evaluation of Agricultural Practices" to collect field data; and 6) collecting evaluation data in Beni Suef, Minya and Dakahliya. Data of evaluating practices in the governorates were collected as follows:

- Beni Suef from a sample of 89 forms from Al-Fashn and Baba.
- Minya from a sample of 200 forms from three areas: Abu Qirgas, Minya and Matai.
- Dakahliya from a sample of 149 forms from El Sinbillawain.

The total sample is representative of the total project target, which is 3000 farmers. The questionnaire was conducted based on the presence of farmers in their place of work at the time of such questionnaire, taking into consideration the distribution of the project target to the three governorates.

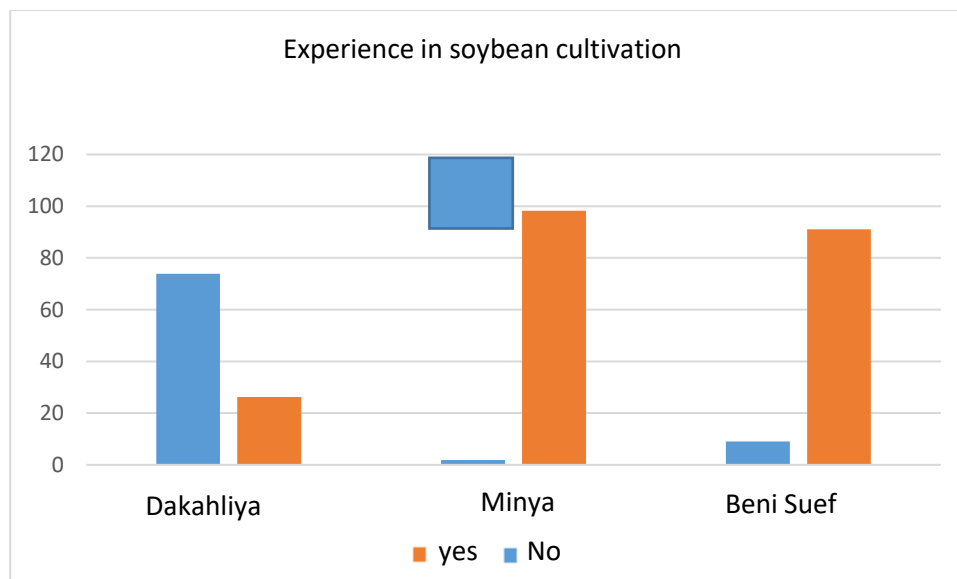
The questionnaire aims at monitoring practices of soybean cultivation among smallholders so that the project can design and determine technical training according to the needs of the farmers (target of the project).

Note:

Data were collected by a trained and specialized team because the majority of farmers are illiterate and data were then randomly verified.

RESULTS ANALYSIS OF BASELINE DATA:

Experience in soybean cultivation		
	No	Yes
Dakahliya	74%	26%
Minya	2%	98%
Beni Suef	9%	91%

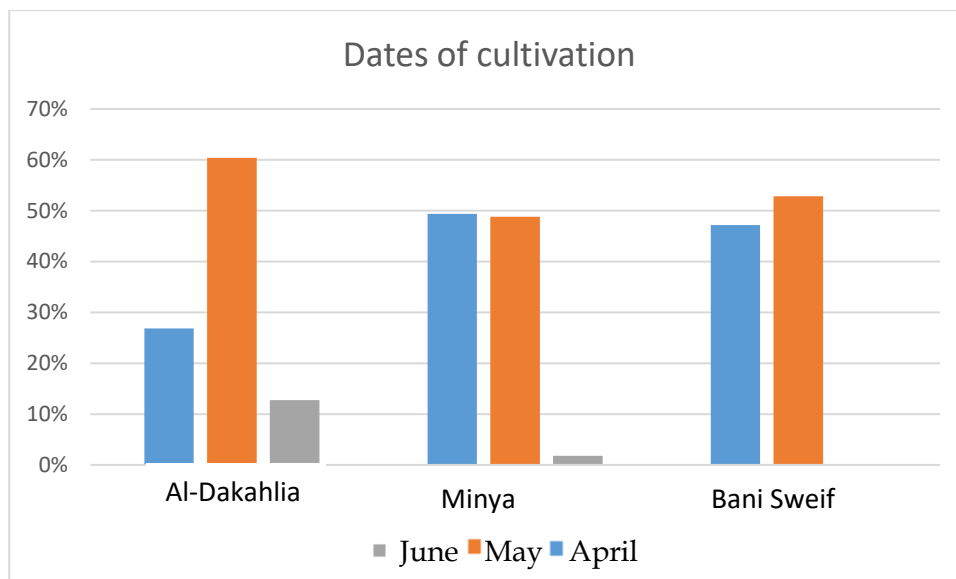


The high level of experience in soybean cultivation in Minya and Beni Suef governorates does not reflect sound practices since experience reflects only long years of soybean cultivation only.

First: Clean Cultivation Practices

1/1 Cultivation at the recommended times avoids the emergence of diseases.

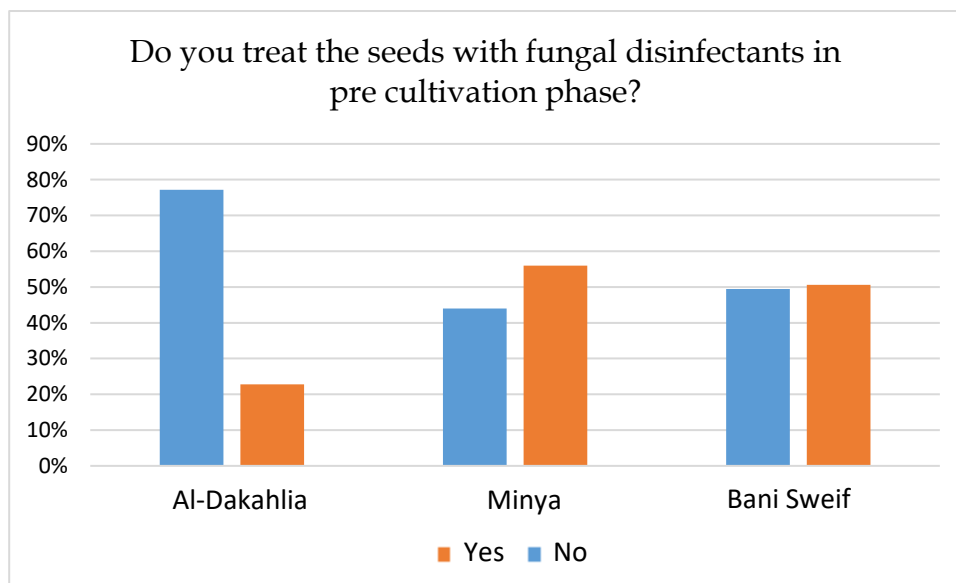
Dates of cultivation			
	April	May	June
Al-Dakahlia	27%	60%	13%
Minya	49%	49%	2%
Bani Sweif	47%	53%	0%



The most suitable time for the recommended soybean cultivation is May. It has been noticed that many farmers in Minya and Beni Suef are farming in April so that they can catch up the cultivation of wheat or potatoes. While agriculture in May, is very late and will lead to shortage of crops.

1/2 Treatment of seeds with fungal disinfectants

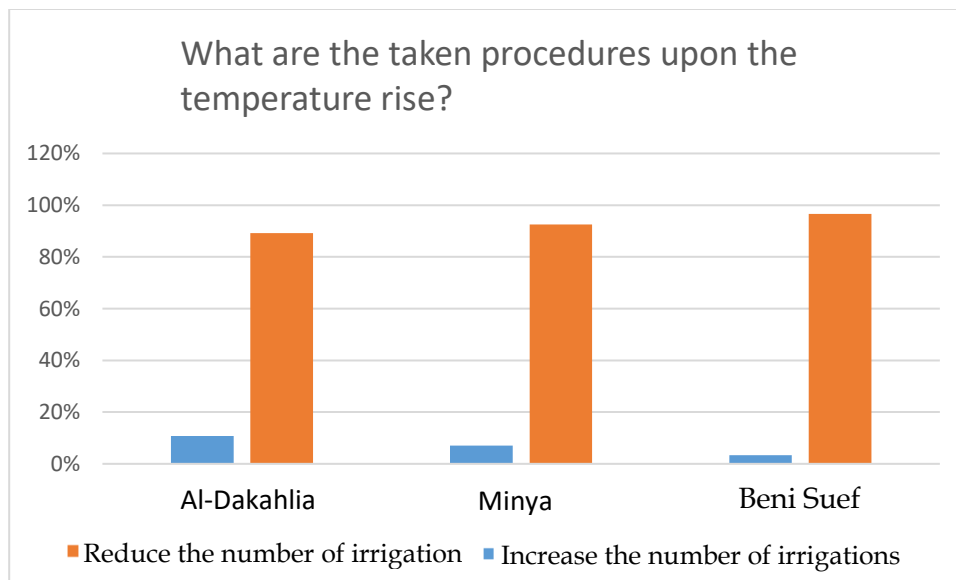
Do you treat the seeds with fungal disinfectants in pre cultivation phase?		
	No	Yes
Al-Dakahlia	77%	23%
Minya	44%	56%
Beni Suef	49%	51%



The treatment of soybean Seeds with fungal disinfectants is important to prevent the death of seedling and avoid root rot, but many farmers do not use it and the statement is untrue in Beni Suef and Minya but it is true in Dakahlia.

1/4 observing irrigation periods especially at high temperatures with non-thirsting

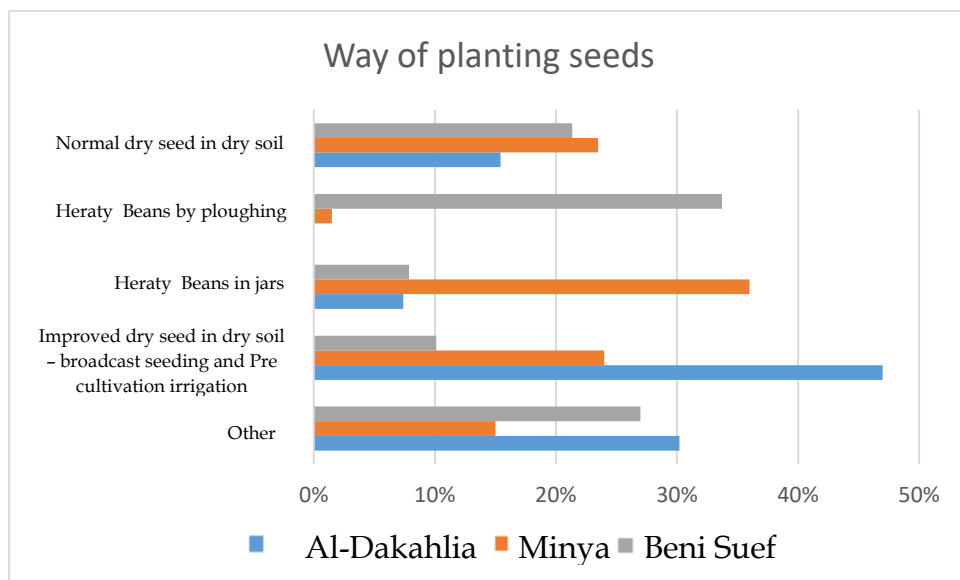
What are the taken procedures upon the temperature rise?		
	Reduce the number of irrigations	Increase the number of irrigations
Al-Dakahlia	11%	89%
Minya	7%	93%
Beni Suef	3%	97%



Farmers are aware of climate change, since when temperatures rise, we must increase the number of irrigation for plants.

1/5 Observing the seeds cultivation when soil moisture is suitable.

way of planting seeds	Al-Dakahlia	Minya	Beni Suef
Other	30%	15%	27%
Improved dry seed in dry soil –and Pre cultivation irrigation	47%	24%	10%
(Heraty) cultivating in moisture soil (in jars)	7%	36%	8%
(Heraty) by ploughing	0%	2%	34%
Normal dry seed in dry soil	15%	24%	21%

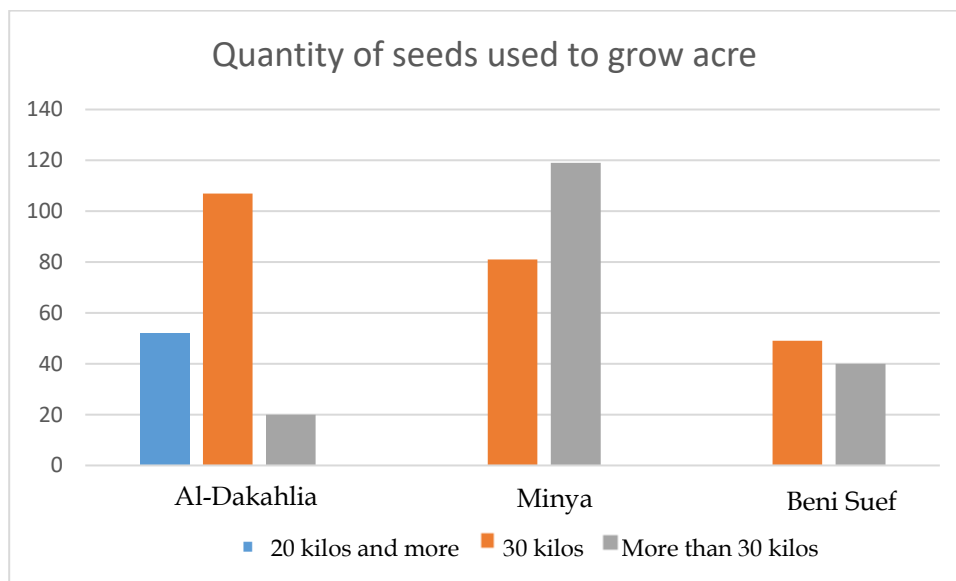


Herati by ploughing is an old traditional method consuming large quantities of seeds and its plant density affects the quality of the crop. It is done by farmers who using the (Clark Seeds) as they are cheap. However, in case of using recommended seeds, improved dry seed in dry soil and pre cultivation irrigation should be utilized where moisture soil helps to the buds to appear.

1/6 Plants should not be cultivated in high density because they are susceptible to some diseases.

The required quantity of seeds to grow one acre:

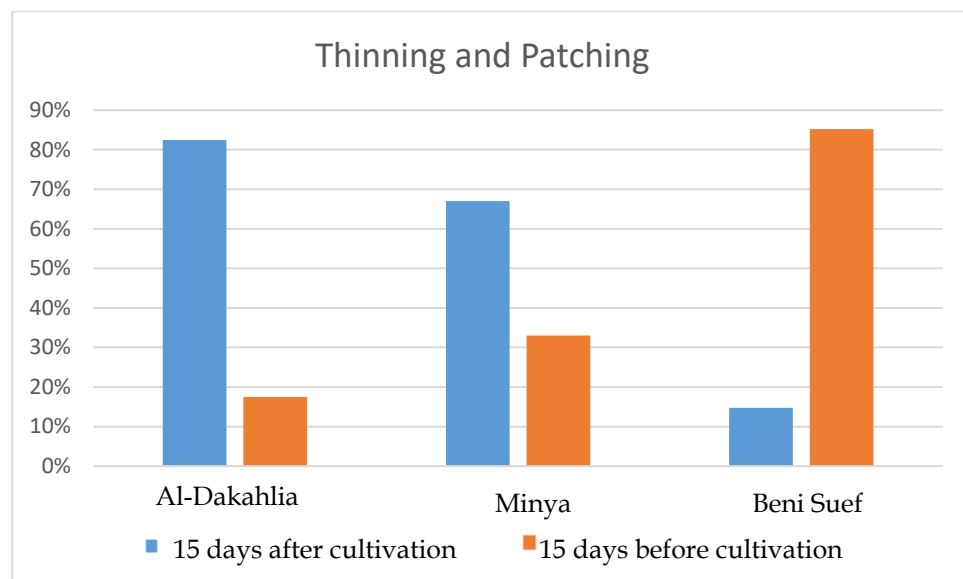
Quantity of seeds used to grow acres	Al-Dakahlia	Minya	Beni Suef
20 kilos and more	52	0	0
30 kilos	107	81	49
More than 30 kilos	20	119	40



This also depends on the type of seeds and this indicates that the Minya and Beni Suef have used broken seeds in large quantities where germination rates are weak and grown in large quantities to reach a good germination in line with the selected seeds.

Thinning and Patching:

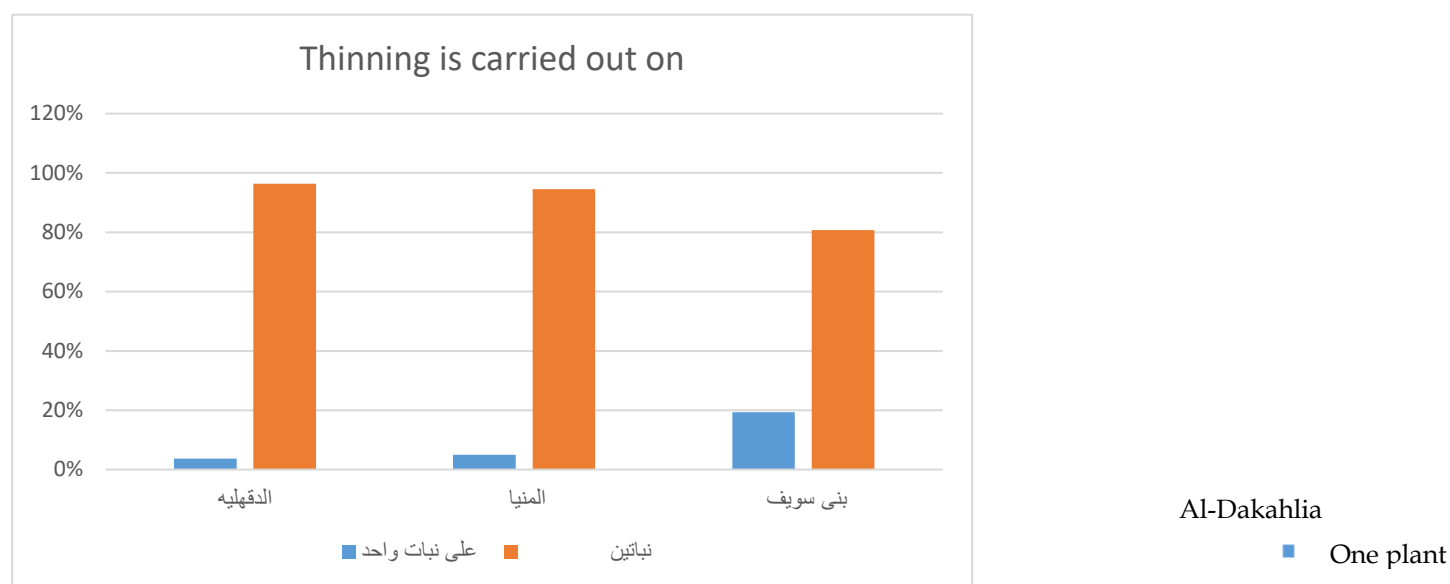
Thinning and Patching	Al-Dakahlia	Minya	Beni Suef
15 days after cultivation	82%	67%	15%
15 days before cultivation	18%	33%	85%



Thinning should be carried out after 15 days of cultivation where most seeds are germinated. It is noted that Beni Suef governorate has carried out the thinning process 15 days before cultivation and this has a negative effect on the crops.

Thinning is carried out on two plants or one plant.

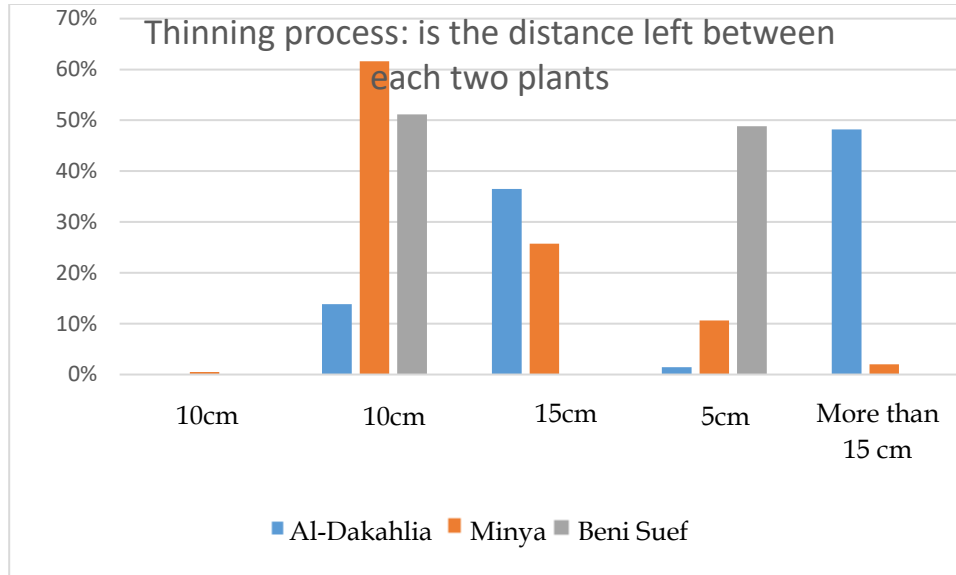
Thinning occurs on	Al-Dakahlia	Minya	Beni Suef
one plant	4%	5%	19%
two plants	96%	95%	81%



Thinning on two plants is the best practice as it is observed at high rates, which reflects farmers' awareness of this fact.

Thinning process: is the distance left between each two plants, 5 cm, 10, 15 cm and more than 15 cm.

Thinning process: is the distance left between each two plants	Al-Dakahlia	Minya	Beni Suef
10cm	0%	0%	0%
10cm	14%	62%	51%
15 cm	36%	26%	0%
5 cm	1%	11%	49%
More than 15 cm	48%	2%	0%

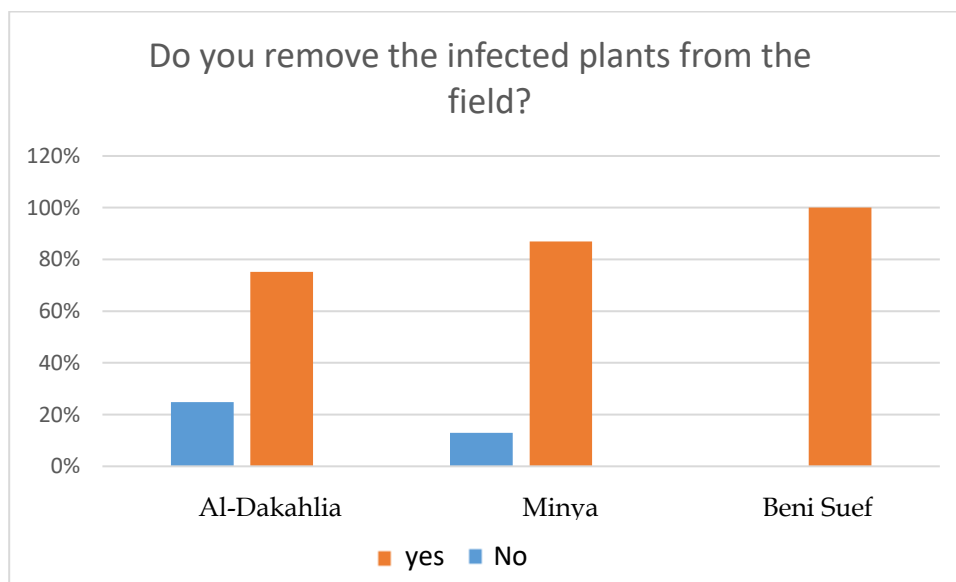


The distance varies according to the method of agriculture. If the cultivation is a spacing, the distance is 5 cm. and incase of other methods it increases to 10 cm. any other increase shall reflect on the plant density in the land and the crops will be reduced accordingly.

1/7 Removing infected plants of the field to avoid producing infected seeds.

Do you remove the infected plants of the field?

Do you remove the infected plants of the field?	Al-Dakahlia	Minya	Beni Suef
No	25%	13%	0%
Yes	75%	87%	100%

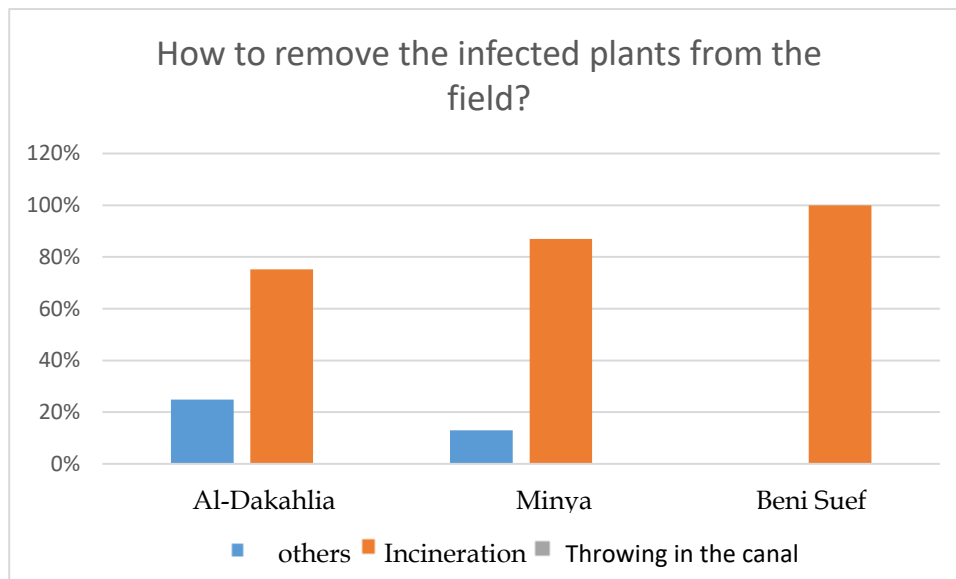


This is a good practice and it is noted that most farmers implement it.

How do you get rid of infected pods and plants? Incineration, throwing in the canals
others

How do you get rid of infected pods and plants?	Al-Dakahlia	Minya	Beni Suef
Other	21%	15%	0%
incineration	60%	80%	100%
Throwing in the canals	19%	5%	0%

The practice percentage must be carried out 100% through incineration, as it is done in Beni Suef, where other methods of disposal other than incineration lead to diseases reemerging, either in the same field or in adjacent fields. Dakahlia, needs of more awareness of this practice.

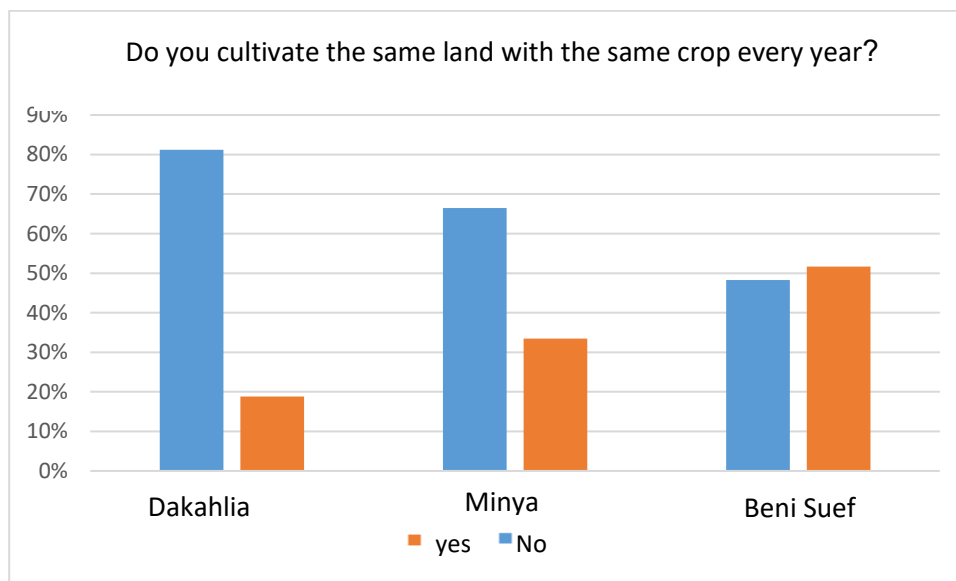


1/8 Following a specific cultivation cycle in the heavily infected areas.

Do you cultivate the same land with the same crop every year?

Do you cultivate the same land with the same crop every year?	Dakahlia	Minya	Beni Suef
no	81%	67%	48%
yes	19%	34%	52%

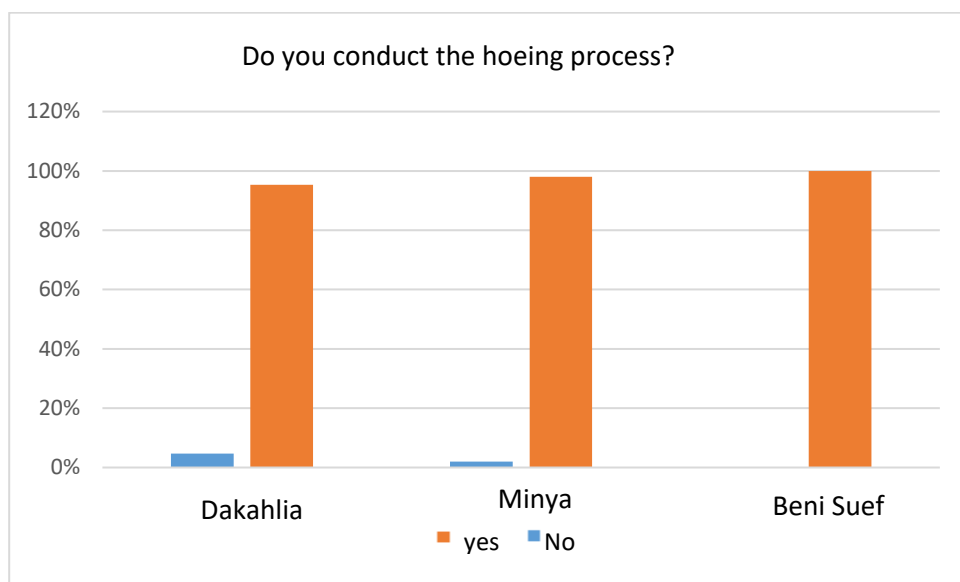
Following cultivation cycles is very important so, the farmer should follow such cycles and they should be reminded to do so. Cycles of cultivation do not weaken the land and increases the crop, so it has to be followed 100%. It is noticed that Dakahlia is the most area that follow cycles of cultivation because they are cultivating vegetables vastly which makes their lands vulnerable to impaired fertility. Cultivating corps like soybean and Egyptian beans enriching the soil fertility.



1/8 Cleaning canals, waterways, furrows, and getting rid of weed.

Do you conduct the hoeing process?

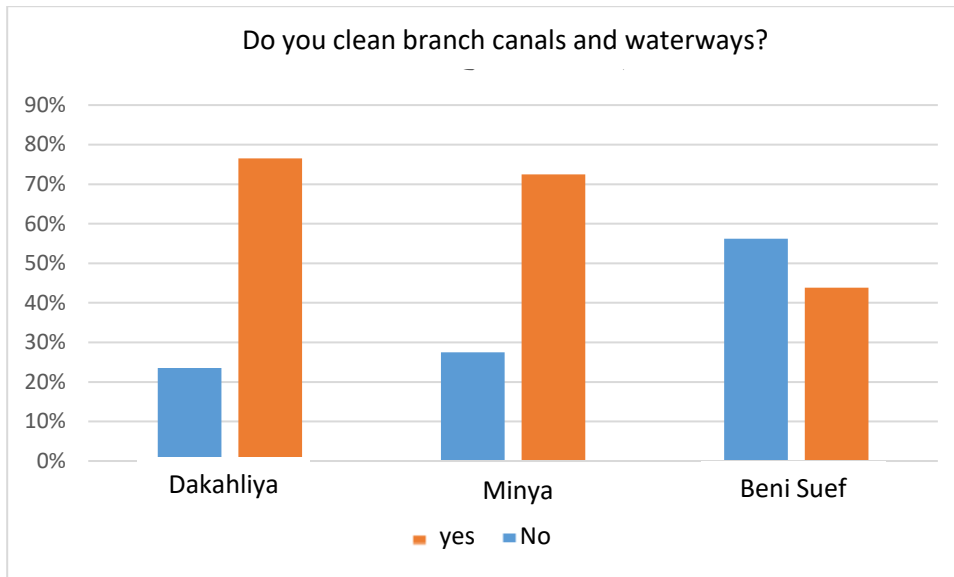
Do you conduct the hoeing process?	Dakahliya	Minya	Beni Suef
No	5%	2%	0%
Yes	95%	98%	100%



The main canals are cleaned by the Ministry of Irrigation on an ongoing and regular basis; however, the problem is arising out from the branch canals since many farmers do not disinfect such canals, which increases the amount of waste water and the growth of exotic weeds that may expose crops to diseases. It is necessary to intervene to develop mechanisms or ways to make farmers disinfect these canals and to work on lining them up as well.

Do you clean branch canals and waterways?

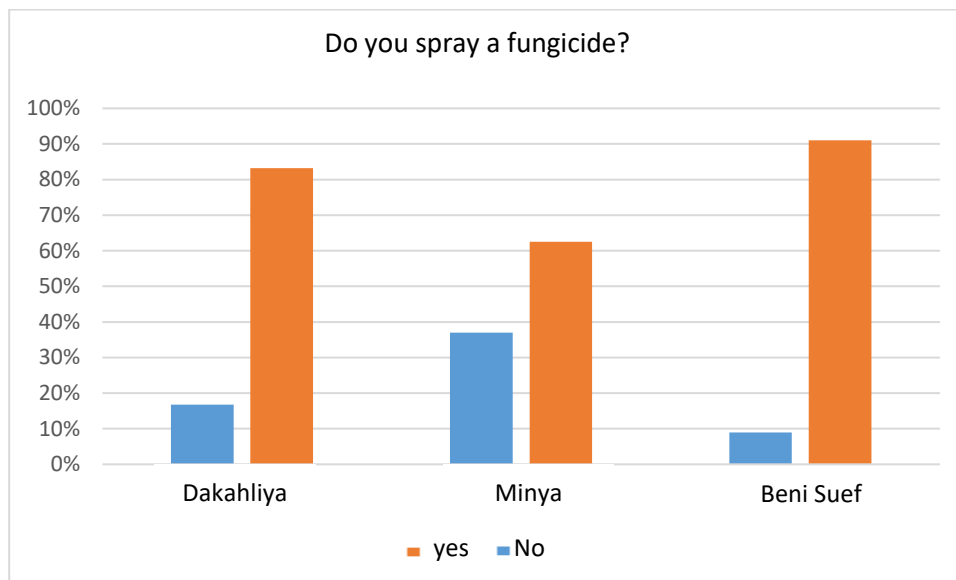
Do you clean branch canals and waterways?	Dakahliya	Minya	Beni Suef
No	23%	28%	56%
Yes	77%	73%	44%



1/9 When spraying is required, it is necessary to spray fungicides between the period seedpod formation and it fullness.

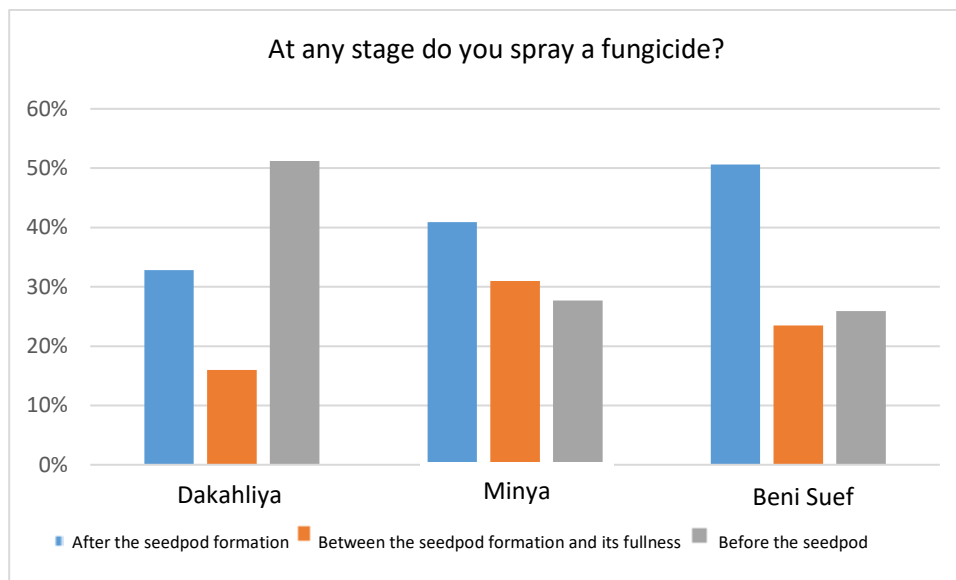
Do you spray a fungicide?

Do you spray a fungicide?	Dakahliya	Minya	Beni Suef
No	17%	37%	9%
Yes	83%	63%	91%



At any stage do you spray a fungicide?

At any stage do you spray a fungicide?	Dakahliya	Minya	Beni Suef
After the seedpod formation	33%	41%	51%
Between the seedpod formation and its fullness	16%	31%	23%
Before the seedpod formation	51%	28%	26%

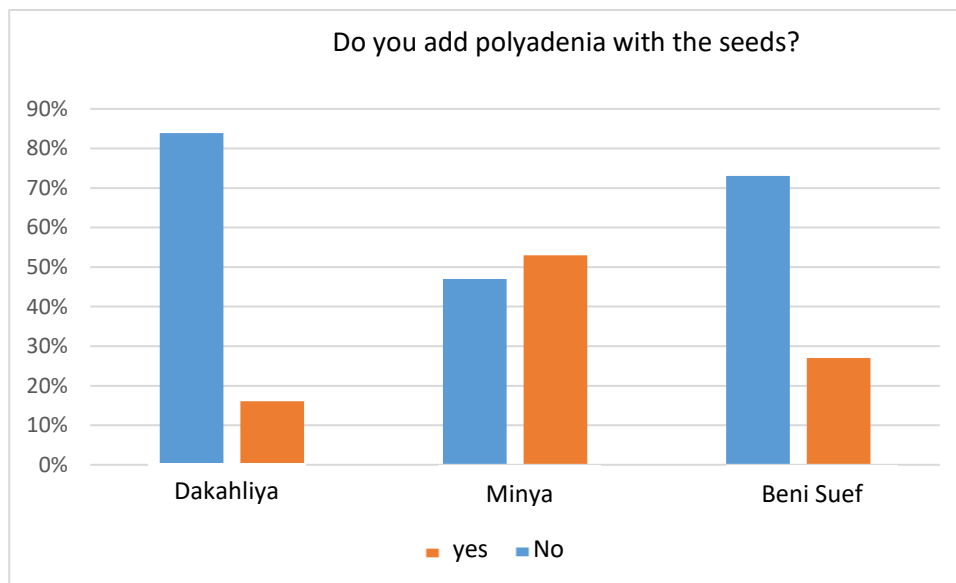




1/10 Avoiding overusing nitrogen fertilization and focusing on potassium fertilization.

Do you add polyadenia with the seeds?

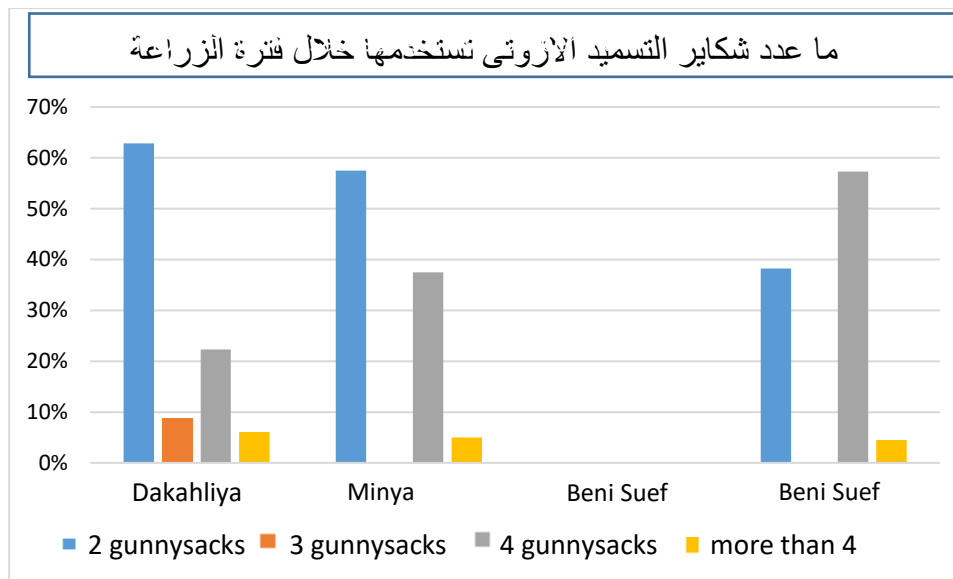
Do you add two polyadenia with the seeds?	Dakahliya	Minya	Beni Suef
No	84%	47%	73%
Yes	16%	53%	27%



Adding polyadenia with the seeds is a significant practice which fixes nitrogen; reduces the use of nitrogen fertilizers; and improve the quality if the crop. It is strange to find that whether the proportion of those who did not use the polyadenia, having a technical awareness, in the new Dakahliya governorate, regarding the cultivation of soybeans, and also Beni Suef, is it not available or what?

How many gunnysacks of nitrogen fertilizers are used during cultivation period?

How many gunnysacks of nitrogen fertilization are used during cultivation period?	Dakahliya	Minya	Beni Suef	Beni Suef
2	63%	58%	0%	38%
3	9%	0%	0%	0%
4	22%	38%	0%	57%
More than 4	6%	5%	0%	4%

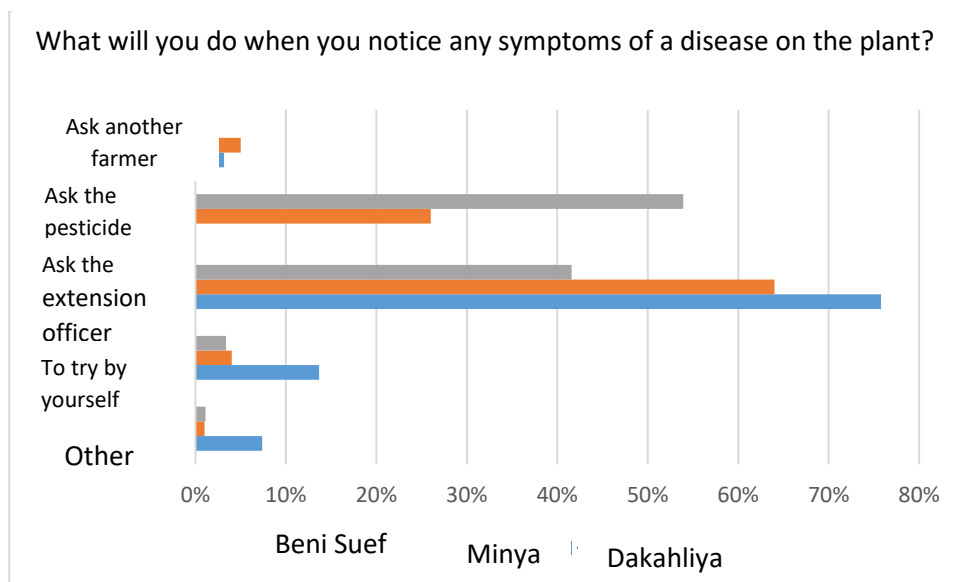


Recommendations indicate that the number of gunnysacks ranges from 1.5 to 2 nitrogen fertilizers; however, it illogical that a governorate like Dakahliya, which does not use polyadenia, uses only 2 gunnysacks in the majority and the plant needs more than that. In Beni Suef, although there is a large number of farmers using polyadenia, they use 4 gunnysacks, which is expensive and illogical. Excessive use of nitrogen fertilizers helps increase vegetable growth than fruit growth.

Excessive use or the possibility of using an unapproved pesticide:

What will you do when you notice any symptoms of a disease on the plant?

What will you do when you notice any symptoms of a disease on the plant?	Dakahliya	Minya	Beni Suef
Other	7%	1%	1%
To try by yourself	14%	4%	3%
Ask the extension officer	76%	64%	42%
Ask the pesticide dealer	0%	26%	54%
Ask another farmer	3%	5%	0%



It is noted that the role of guidance is very weak in Beni Suef where traders play a substantial role in raising awareness of farmers. Hence, it is necessary to pay a great attention to raising the awareness of traders themselves and the role of guidance is clear in Dakahliya. Therefore, it is necessary to pay attention to their training.



Second: Increasing Protein or Oil Practices

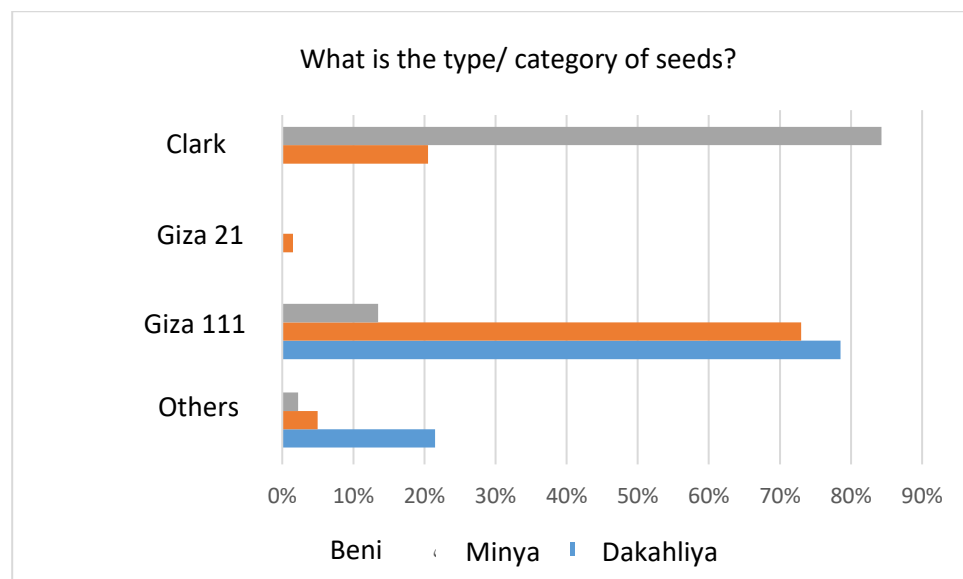
There is an inverse relationship between the ratio of protein and oils. If the objective of cultivation is to obtain oils, it is necessary to do the following:

2/1 Date of cultivation: Early: to increase the oil Late: for the purpose of producing seeds:
Question 1/1

2/2 Choosing a recommended category:

-What is the type/ category of seeds?

What is the type/ category of seeds?	Dakahliya	Minya	Beni Suef
Others	21%	5%	2%
Giza 111	79%	73%	13%
Giza 21	0%	2%	0%
Clark	0%	21%	84%





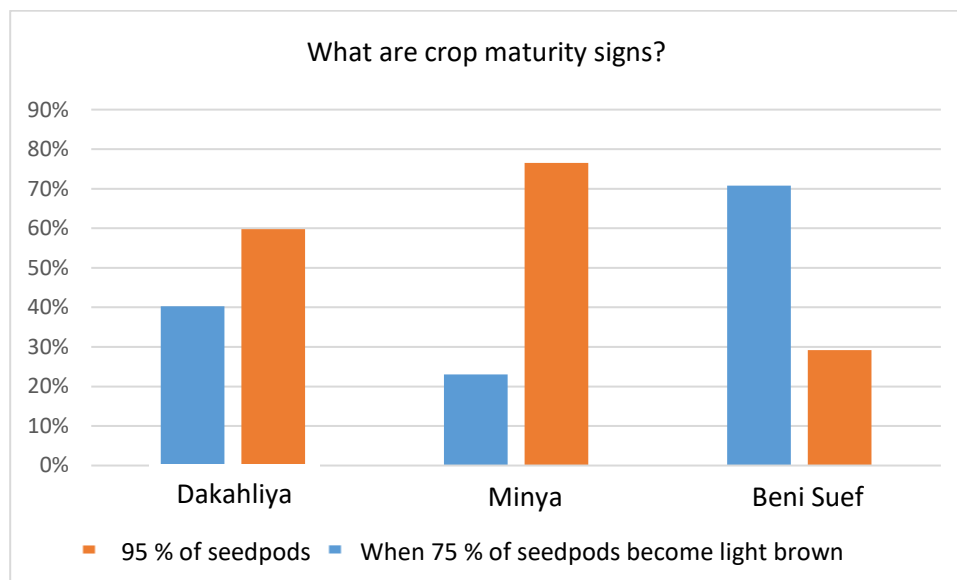
It is noted that the governorate of Beni Suef uses the category limited to farmers, which is the Clark, and this is due to the limited period of such category, which takes only 90 days and this according to the quantity and quality of the crop. Therefore, it is necessary to intervene more to influence farmers to cultivate certified categories such as Giza 111.

Third: Lean Production Practices

3/1 Determination of crop maturity signs accurately

What are crop maturity signs?

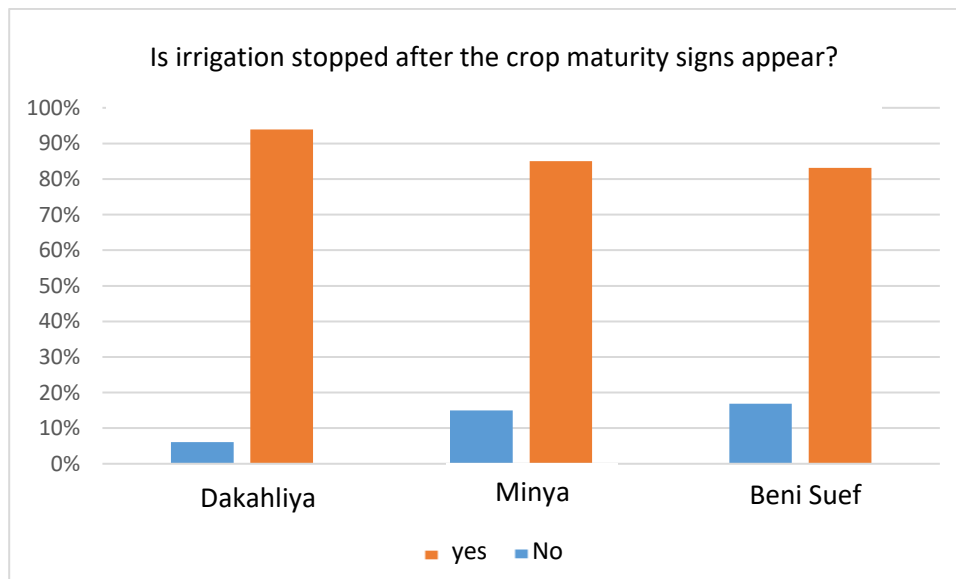
What are crop maturity signs?	Dakahliya	Minya	Beni Suef
95 % of seedpods	40%	23%	71%
When 75 % of seedpods become light brown	60%	77%	29%



95% is the right practice. It is clear that Minya and Dakahliya need to increase knowledge of crop maturity signs.

Is irrigation stopped after the crop maturity signs appear?

Is irrigation stopped after the crop maturity signs appear?	Dakahliya	Minya	Beni Suef
No	6%	15%	17%
Yes	94%	85%	83%

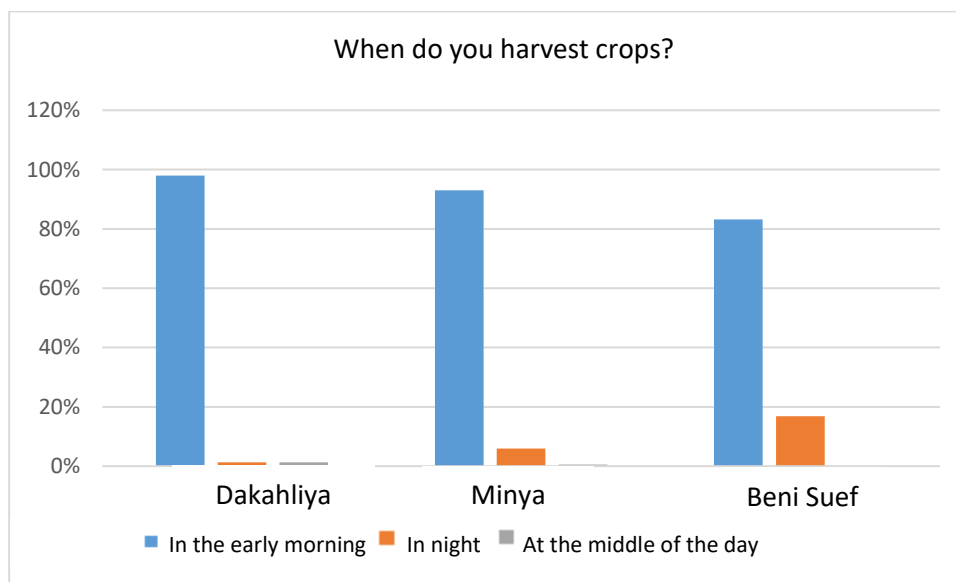


Most farmers have a good knowledge regarding the prevention of irrigation from 90 to 100 days of plant life, when the color of seedpods changes and leaves become yellow.

3/2 Harvest at the early morning

When do you harvest crops?

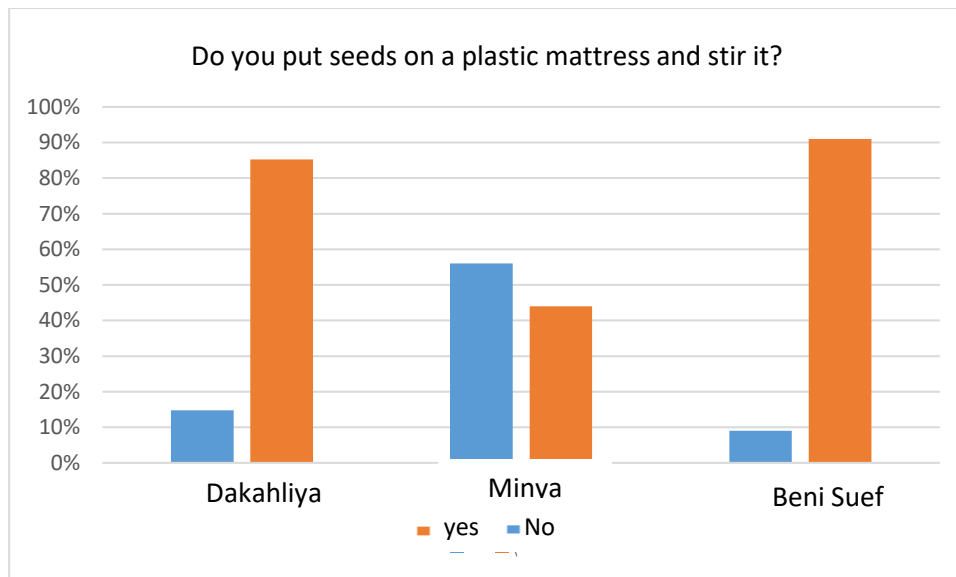
When do you harvest crops?	Dakahliya	Minya	Beni Suef
In the early morning	98%	93%	83%
In night	1%	6%	17%
At the middle of the day	1%	1%	0%



3/3 Putting seeds on a plastic sheets; stirring it; and protecting it from birds

After harvest, do you put seeds on a plastic mattress and stir it?

Do you put seeds on a plastic sheets and stir it?	Dakahliya	Minya	Beni Suef
No	15%	56%	9%
Yes	85%	44%	91%

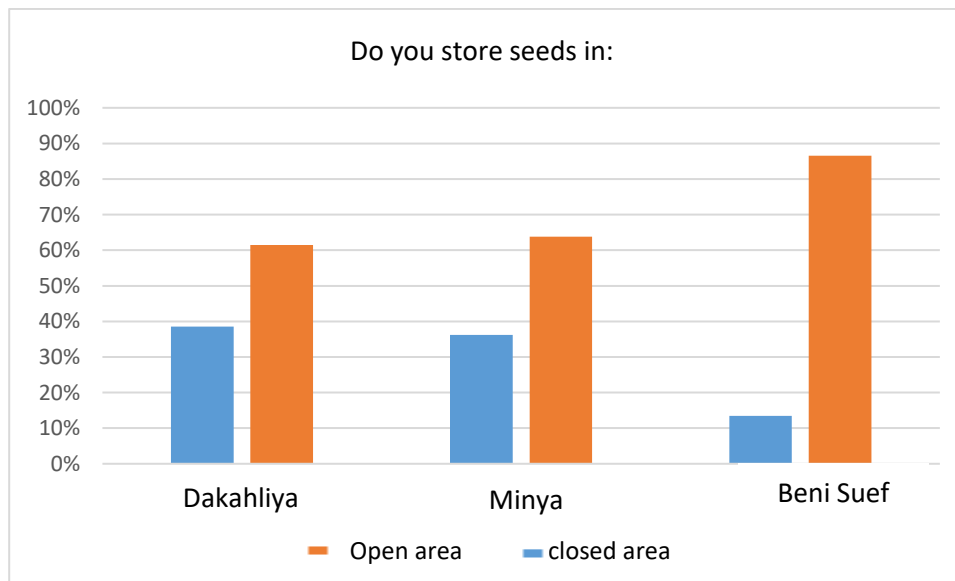


A good practice that helps increase the quality of and reduce the percentage of lean production.

Such practice is conducted by putting seeds on a plastic sheets after harvest. Minya needs to increase awareness of this.

Do you store seeds in:

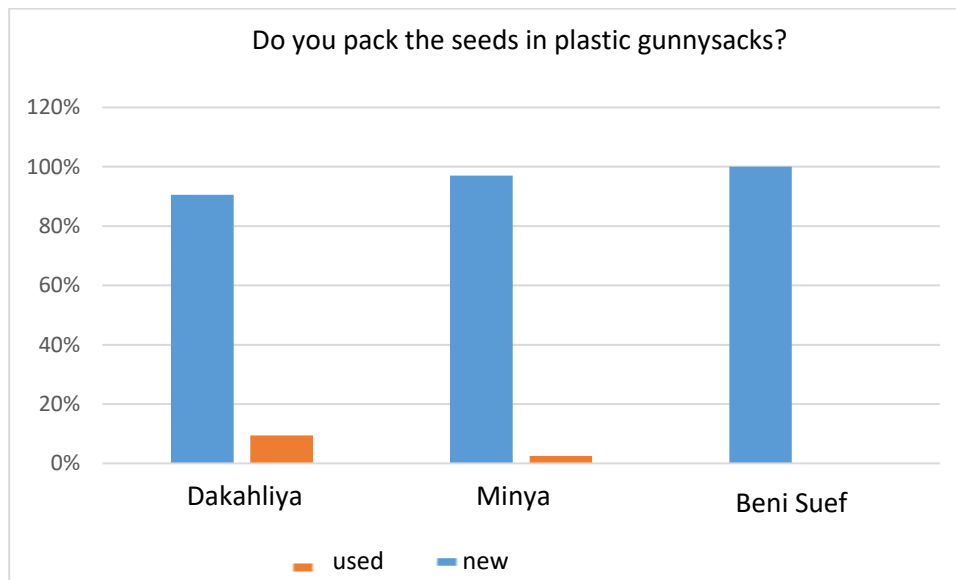
Do you store seeds in:	Dakahliya	Minya	Beni Suef
Closed area	39%	36%	13%
Open area	61%	64%	87%



It is noted that there are no closed areas in the storage of seeds in the provinces and this depends on the period of storage; if such period is long, seeds must be stored in a closed area to avoid the sun, weather factors and rain, which can expose the crop to corruption and can be eaten by birds and thus affects its quality and also increases the percentage of lean production.

3/4 The crop is placed in small piles, not large ones.

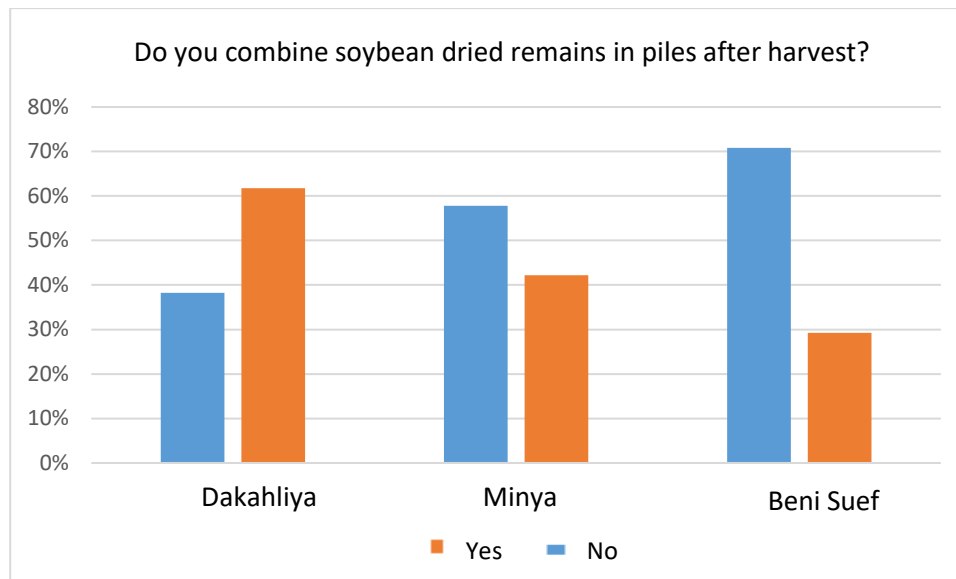
Do you pack the seeds in plastic gunnysacks?	Dakahliya	Minya	Beni Suef
New	91%	97%	100%
Used	9%	3%	0%



Of course, the new gunnysacks is the best and this affects the quality of the crop significantly and also reduces lean production.

3/5 Packing seeds of soybeans in proper plastic gunnysacks

Do you combine soybean dried remains in piles after harvest?	Dakahliya	Minya	Beni Suef
No	38%	58%	71%
Yes	62%	42%	29%



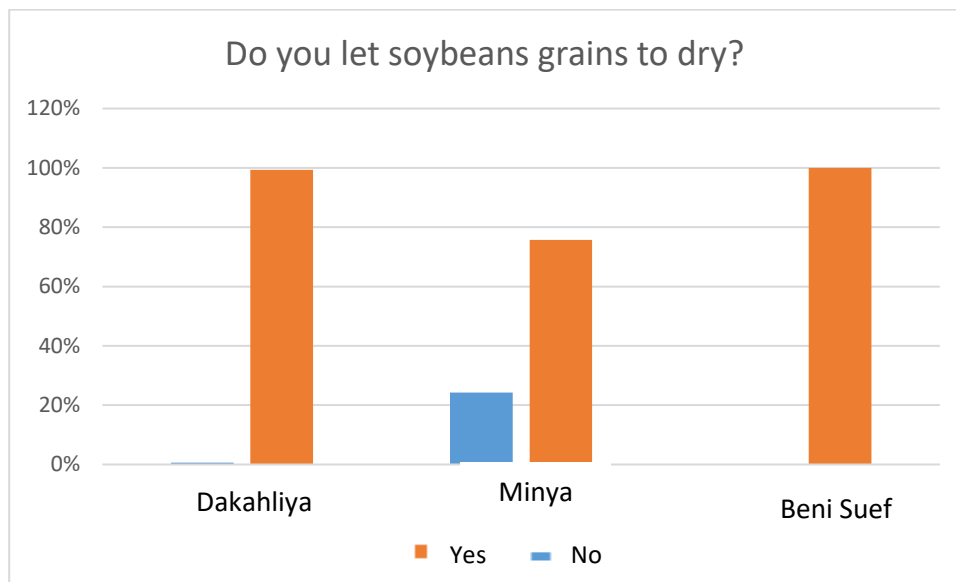
This practice, which is combining, helps reduce the lean production significantly. There are no mechanical mowers to combine soybeans straw and few farmers are combining piles, which is illogical in terms of actual implementation or knowledge only.

Fourth: Post-Harvest Soybean Trading Practices

4/1 Soybeans **dried remains** should be assembled after maturity date in small piles.

Do you attach soybean dried remains in piles post-harvest?

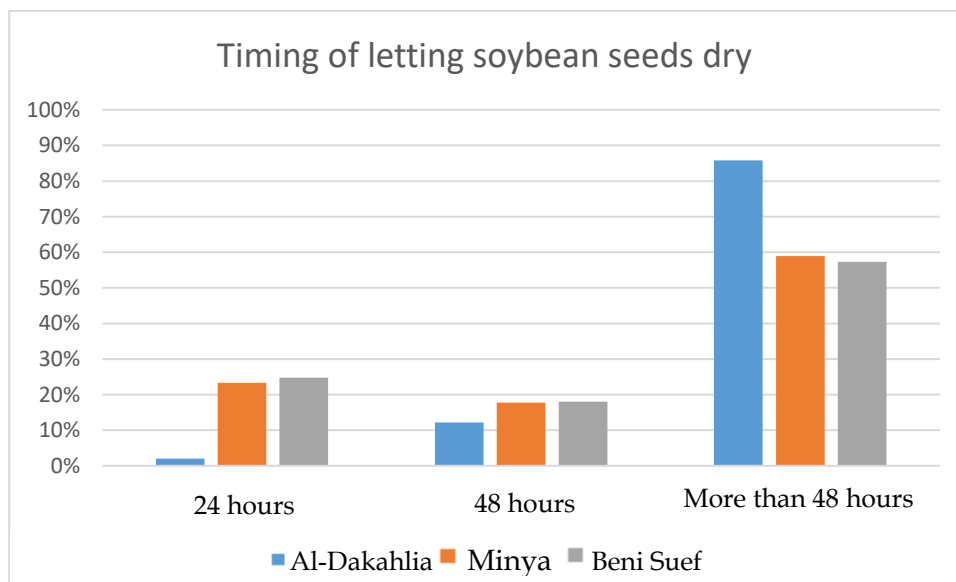
Do you let soybean grains to dry?	Al-Dakahlia	Minya	Beni Suef
No	1%	24%	0%
Yes	99%	76%	100%



Piles should be left after harvesting for some time to reduce the moisture level, but not for a long period, it is harmful to the crop and it is clear that the farmers have a great knowledge of this practice.

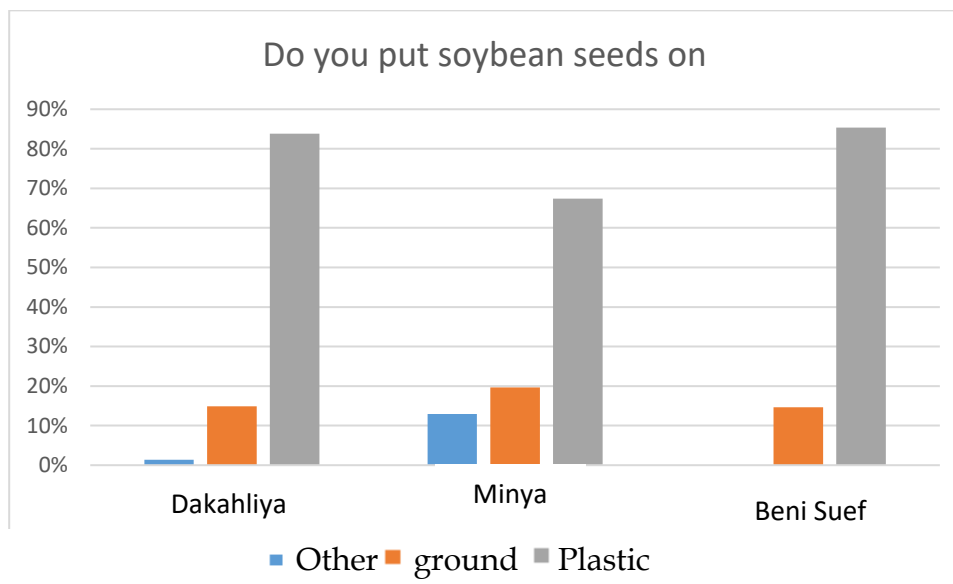
4/2 Let soybeans dry for 48 hours.
Do you let soybeans dry?

Timing of letting soybean seeds dry	Al-Dakahlia	Minya	Beni Suef
24 hours	2%	23%	25%
48 hours	12%	18%	18%
More than 48 hours	86%	59%	57%



Do you put soybean seeds on:

Do you put soybean seeds on	Al-Dakahlia	Minya	Beni Suef
Other	1%	13%	0%
ground	15%	20%	15%
Plastic	84%	67%	85%

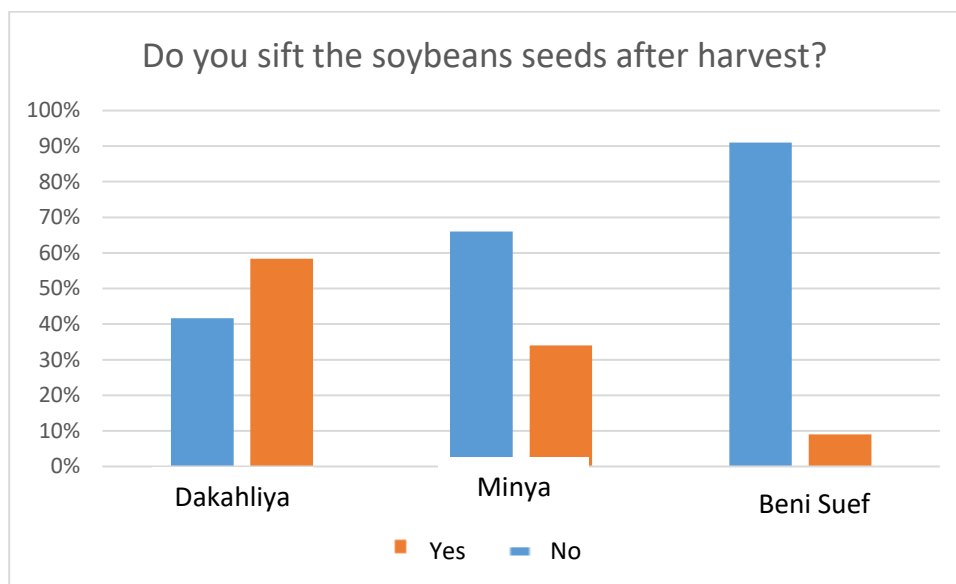


As mentioned earlier, putting soybean seeds on plastic reduces the loss and increases the quality.

4/3 Grains can be sifted to separate whole grains from broken ones, clay blocks and small plant stalks.

Do you sift the soybeans seeds after harvest?

Do you sift the soybeans seeds after harvest?	Al-Dakahlia	Minya	Beni Suef
No	42%	66%	91%
Yes	58%	34%	9%



The sifting is a good practice that farmers should do to increase the quality of the crop, but most of them do not do so to avoid production cost increase. The statement of Dakahlia and Minya is reconsidered, which helps to avoid sifting. In addition, traders do not care whether the crops is sifted or not, farmers sell their crops in one price, whether the crop sifted or not. Therefore, the farmer refrain from doing this process.

4/4 Packing grains in a clean plastic gunny sacks: Question 3/5

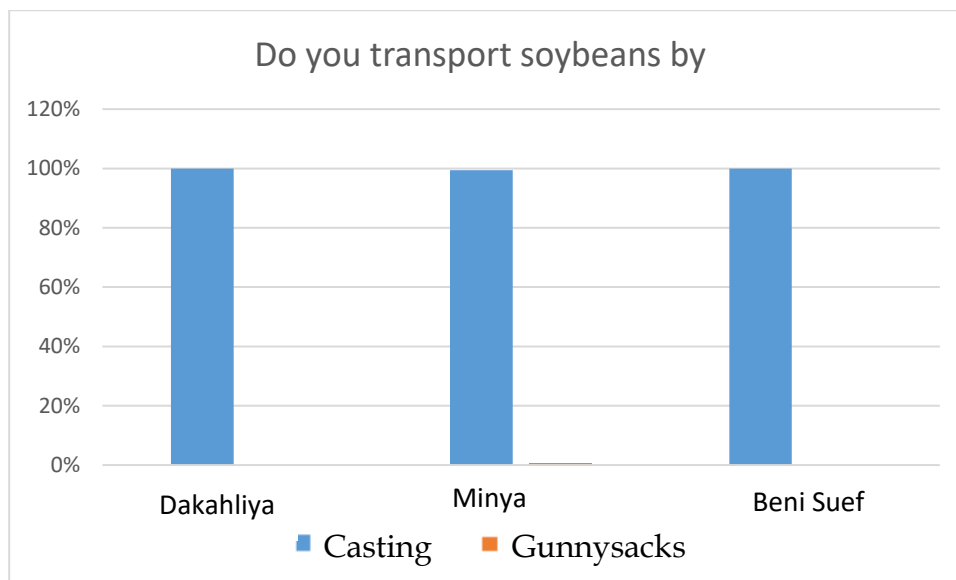


4/5 Way of soybeans carriage.

Do you carry soybeans by:

Do you carry the soybeans seeds by	Al-Dakahlia	Minya	Beni Suef
Gunny sacks	100%	99%	100%
Casting	0%	1%	0%

This is logical because most farmers sell the crop to the trader who needs the seeds in the gunny sacks for easy storage, while casting is for companies only.



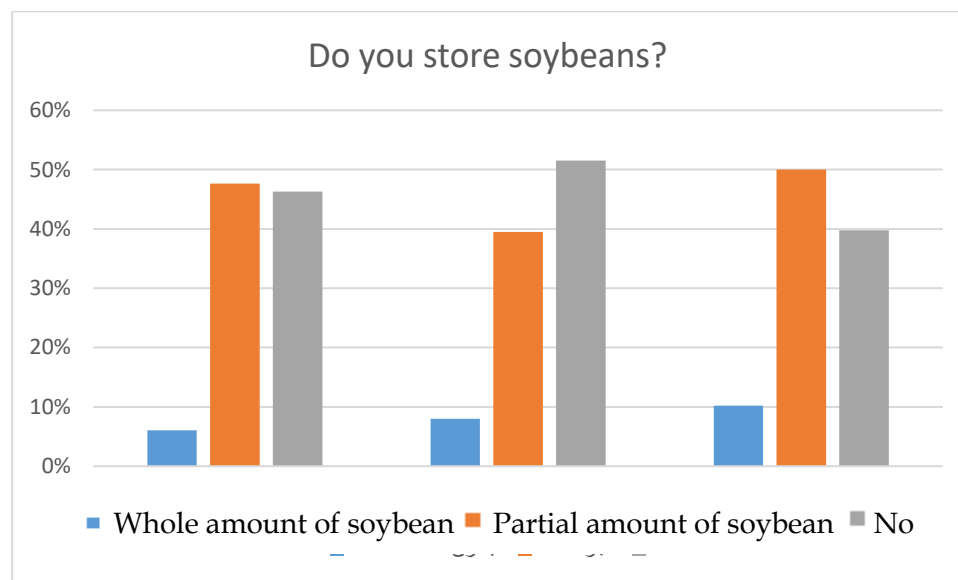
Fifth: Soybean Storage

5/1 Capacity of soybean storage.

Do you store soybeans?

Do you store soybean crop?	Al-Dakahlia	Minya	Beni Suef
Whole amount of soybean	6%	8%	10%
Partial amount of soybean	48%	40%	50%
No	46%	52%	40%

This is a good indicator as most farmers store half of their output to get a higher price but more importantly how to store it and it is not clear whether they store it properly.

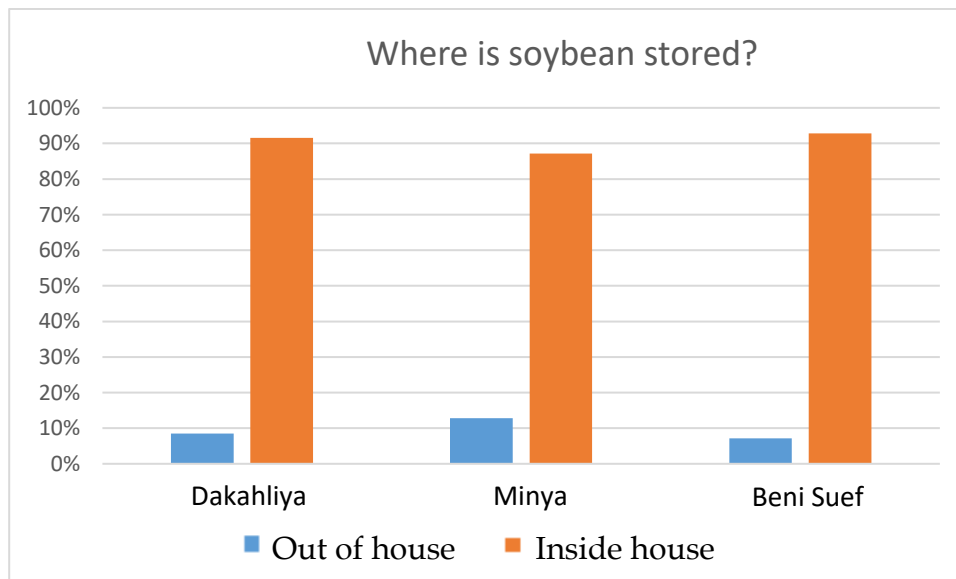




Where do you store soybean?

Where is soybean stored	Al-Dakahlia	Minya	Beni Suef
Out of house	8%	13%	7%
Inside house	92%	87%	93%

Inside house storage, it is safe and this is a good and proper indicator.

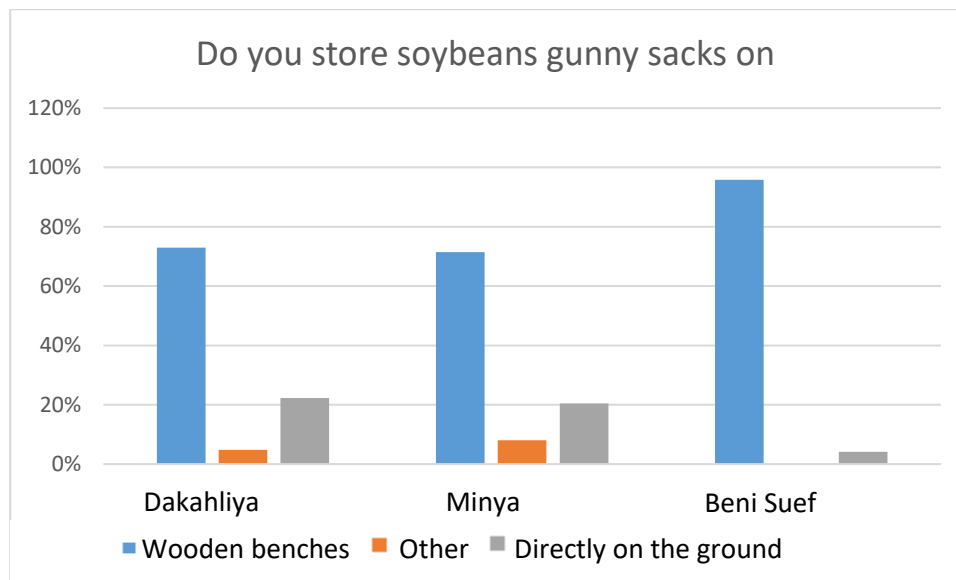


5/2 Storage methods

Do you store soybeans gunny sacks on:

Do you store soybeans gunny sacks on	Al-Dakahlia	Minya	Beni Suef
wooden benches	73%	72%	96%
Other	5%	8%	0%
On ground directly.	22%	20%	4%

Storage on wooden boards is a good practice where it keeps the seeds from moisture and water and does not affect the quality of the seed.

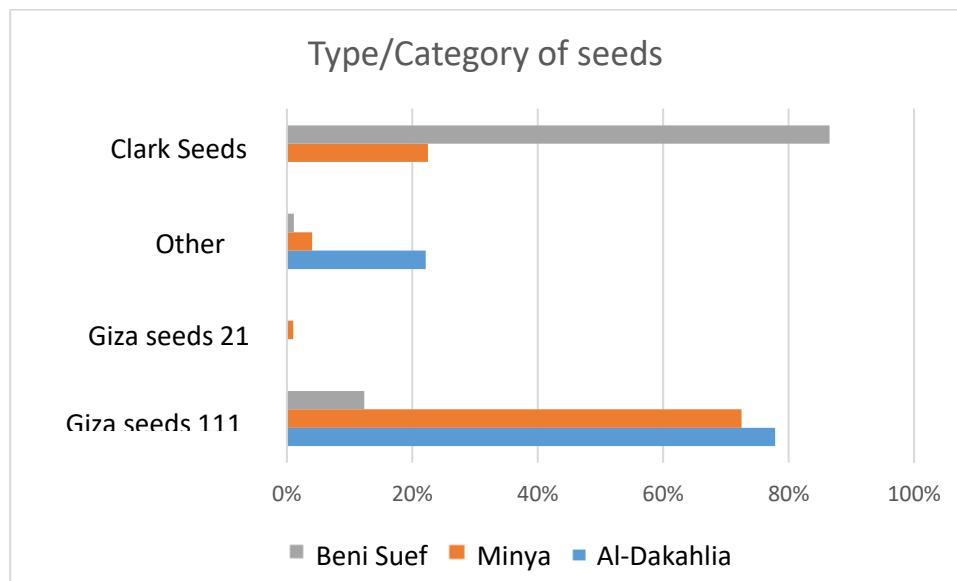


Sixth: Practices to Reduce the Percentage of Green Grains

1/6 Select approved seeds type

Type/Category of seeds:

Type/Category of seeds	Al-Dakahlia	Minya	Beni Suef
Giza seeds 111	78%	73%	12%
Giza seeds 21	0%	1%	0%
Other	22%	4%	1%
Clark Seeds	0%	23%	87%



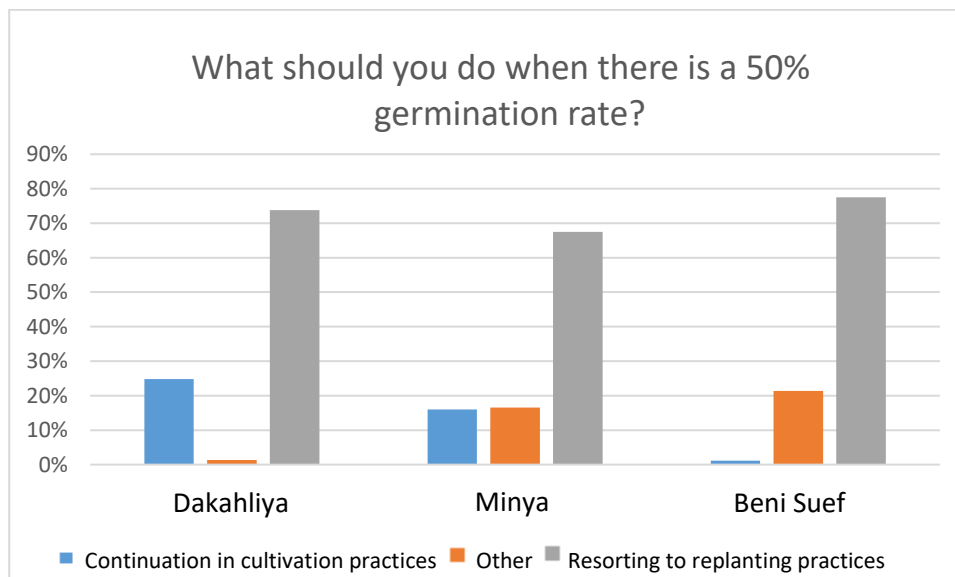
It is evident that Beni Suef needs an extensive and intensive awareness regarding the use of selected seeds over the local broken Seeds.

2/6 Upon noting that the rate of germination is weak, there should be no significant replanting not to result in an uneven maturity of pods.

What should you do when there is a 50% germination rate?

What should you do when there is a 50% germination rate?	Al-Dakahlia	Minya	Beni Suef
continuation in cultivation practices	25%	16%	1%
Other	1%	17%	21%
Resorting to replanting practices	74%	68%	78%

Discontinuing agriculture is a good practice because proper farming and replanting more than 50% results in difference in work and this affects the agricultural work, thus reduces the productivity and quality of the crop.

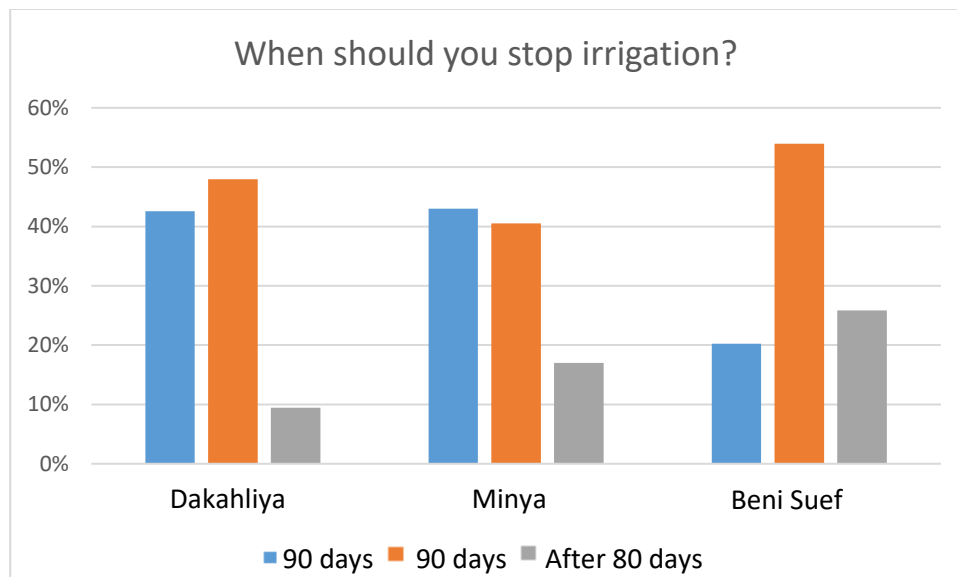


3/6 Observe maturity signs before harvest and stop irrigation completely.

When should I stop irrigation?

When should you stop irrigation?	Al-Dakahlia	Minya	Beni Suef
90 days	43%	43%	20%
100 days of plant life	48%	41%	54%
After 80 days	9%	17%	26%

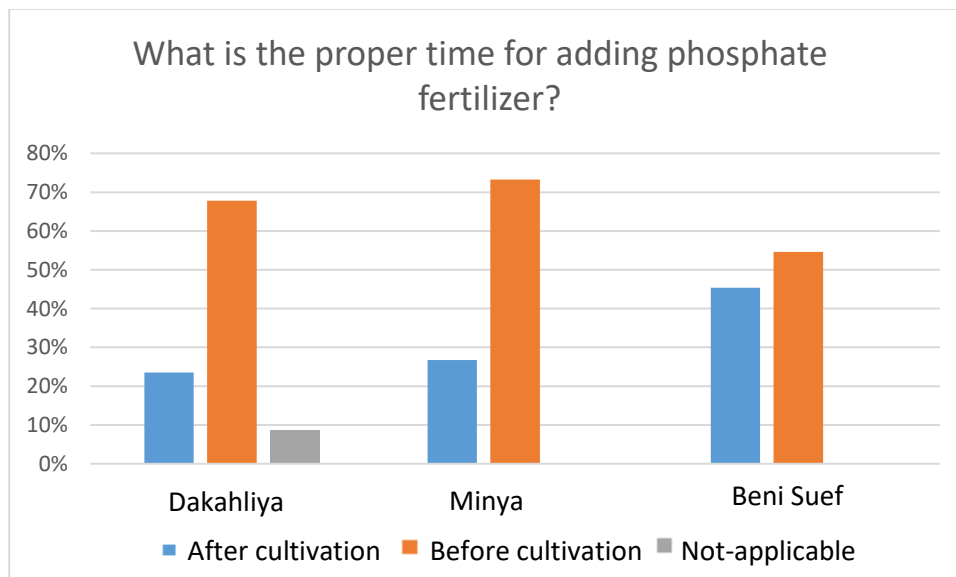
From 90 to 100 days is a good plant life, you should stop the irrigation thereafter not to affect the quality of the crops.



6/4 Ensure to apply the fertilization of superphosphate during the service.
 What is the proper time for adding superphosphate fertilizer?

What is the date of adding phosphate fertilizer?	Al-Dakahlia	Minya	Beni Suef
After cultivation	23%	27%	45%
Before cultivation	68%	73%	55%
N/A	9%	0%	0%

It is better for the farmer to add the phosphate fertilizer upon the service and preparing the land before planting to allow the plant to benefit better therefrom when growing and absorbed from the land.

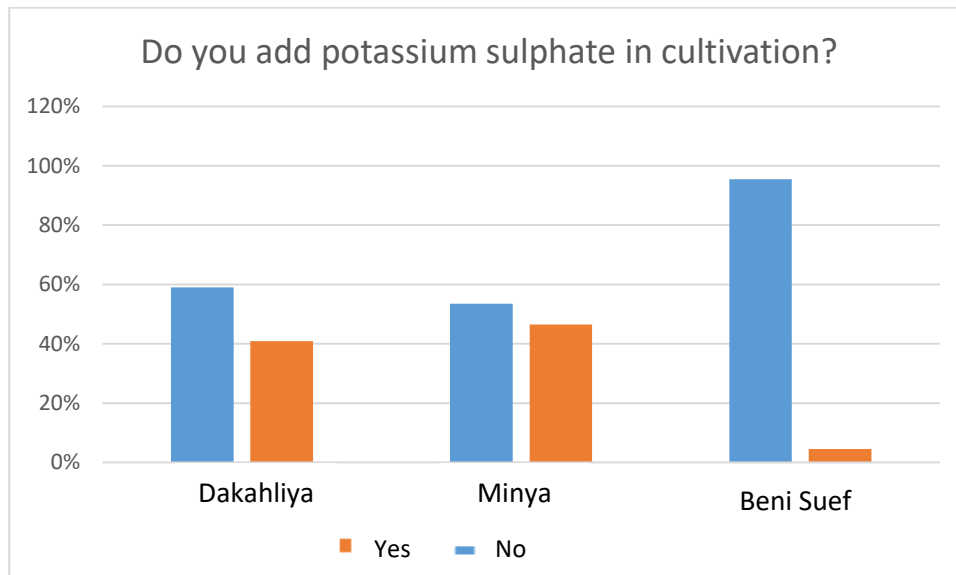


5/6 Potassium spraying

Do you add potassium sulphate in cultivation?

Do you add potassium sulphate in cultivation?	Al-Dakahlia	Minya	Beni Suef
No	59%	54%	96%
Yes	41%	47%	4%

This is one of the practices that should be followed by farmers, as it affects the quality of the seed, awareness should be raised in respect of this, as it works to increase the weight of the seed and protection of Etiella zinckenella.



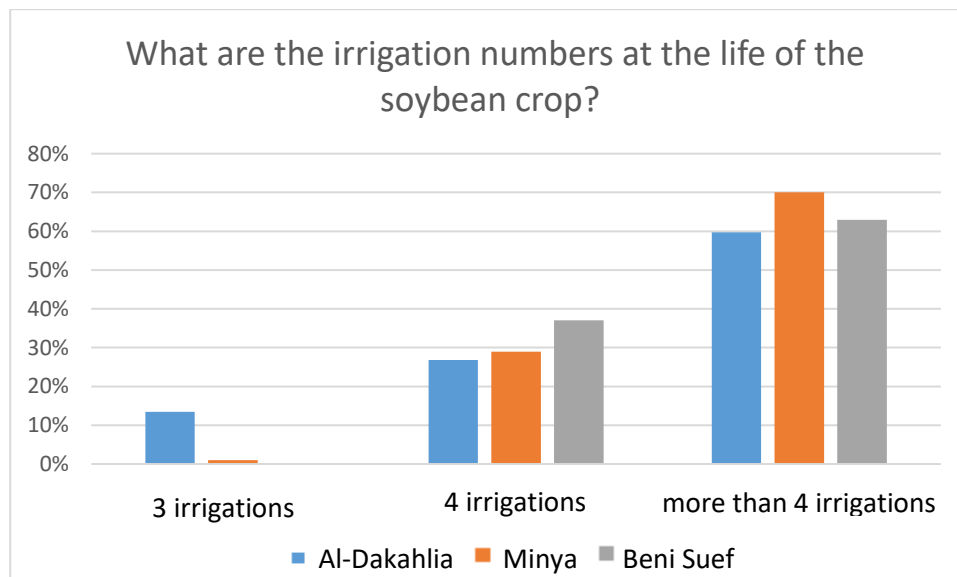
Seventh: Quality of Irrigation Methods

1/7 Avoid overuse of irrigation water.

What are the irrigation numbers in the soybean crop life span?

What are the irrigation numbers in the soybean crop life span?	Al-Dakahlia	Minya	Beni Suef
3 irrigations	13%	1%	0%
4 irrigations	27%	29%	37%
more than 4 irrigations	60%	70%	63%

The number of irrigations can be more than 4, in the case of high temperatures and not less than 4, as most farmers do so.

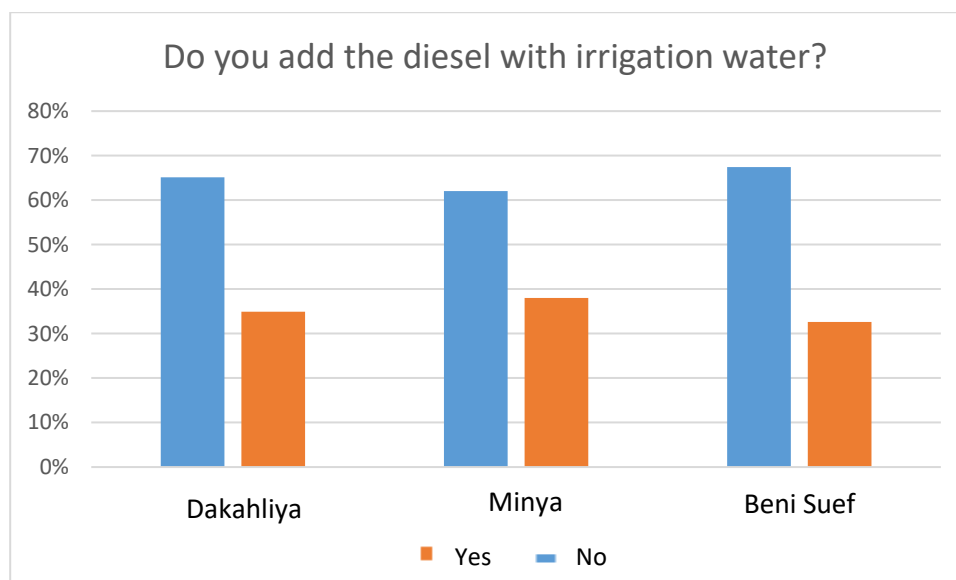


2/7 Cleaning processes of canal and sub canal increase the irrigation efficiency. Question 1/8

3/7 The use of diesel with irrigation water increases the efficiency of irrigation.
Do you add the diesel with irrigation water?

Do you add the diesel with irrigation water?	Al-Dakahlia	Minya	Beni Suef
No	65%	62%	67%
Yes	35%	38%	33%

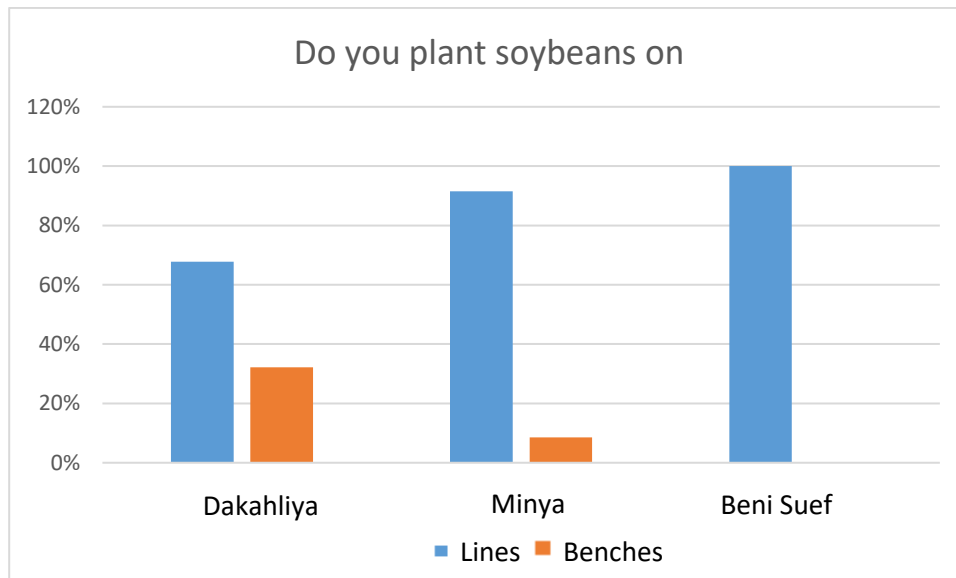
The use of diesel with irrigation water is a good practice, where it reduces the infection of *Spodoptera littoralis*, but many farmers do not use this practice due to the high price of diesel, but should a disease emerges, they will spend a lot over pesticides.



4/7 Methods of the irrigation water access to plants directly or by infiltration
 Do you plant soybeans on lines or benches?

Do you plant soybeans on lines or terraces?	Al-Dakahlia	Minya	Beni Suef
Lines	68%	92%	100%
Benches	32%	9%	0%

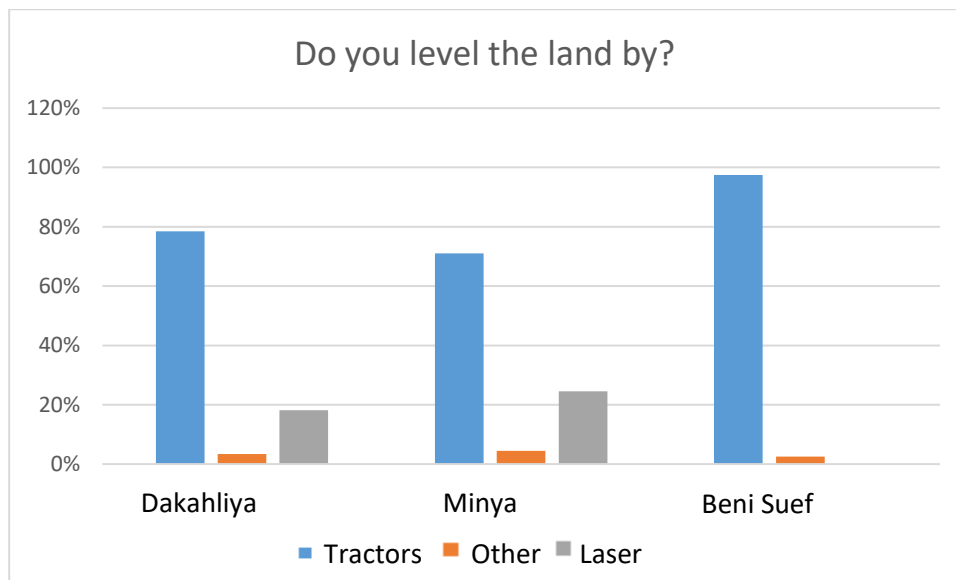
The cultivation on the benches is a new non-widespread and very important practice and it should be spread as it reduces almost 30% of the irrigation water consumption. Soybeans can be grown on wheat benches and therefore reduce the cost of processing the land as well.



5/7 Land processing for cultivation:
Do you level the land?

Do you level the land by	Al-Dakahlia	Minya	Beni Suef
Tractor	79%	71%	97%
Other	3%	5%	3%
Laser	18%	25%	0%

The laser land levelling should be disseminated, where 100% of the soil is level, thus reducing the loss of irrigation water and the levelling with tractor is a good practice but not like the laser leveling efficiency.

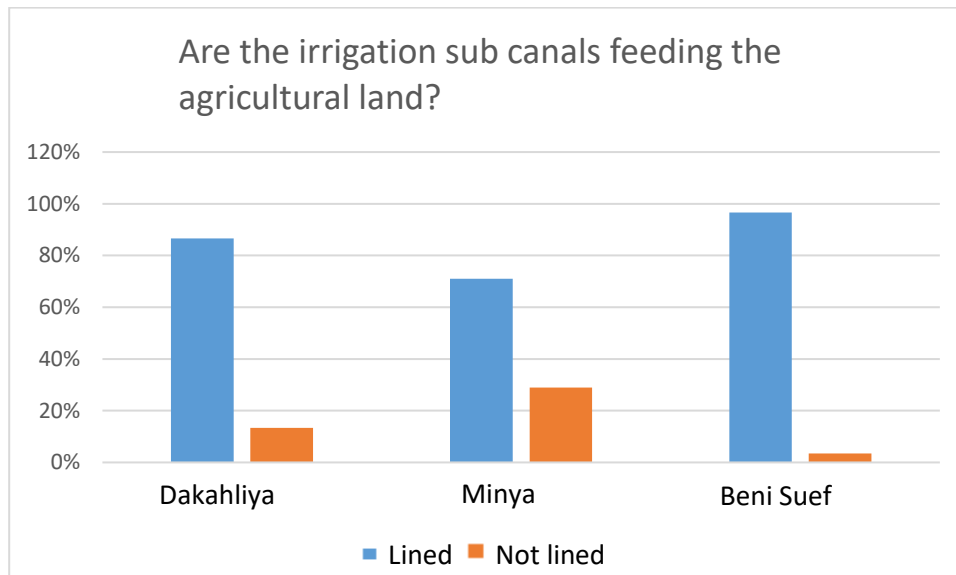


6/7 Irrigation Sub-canals:

Are the irrigation sub canals feeding the agricultural land?

Are the irrigation sub canals feeding the agricultural land	Al-Dakahlia	Minya	Beni Suef
Not lined	87%	71%	97%
Lined	13%	29%	3%

The lining of the sub-irrigation canals is very useful but needs large budgets but it helps greatly in rationalizing the irrigation water and also reduces the diseases resulting from the presence of weeds.



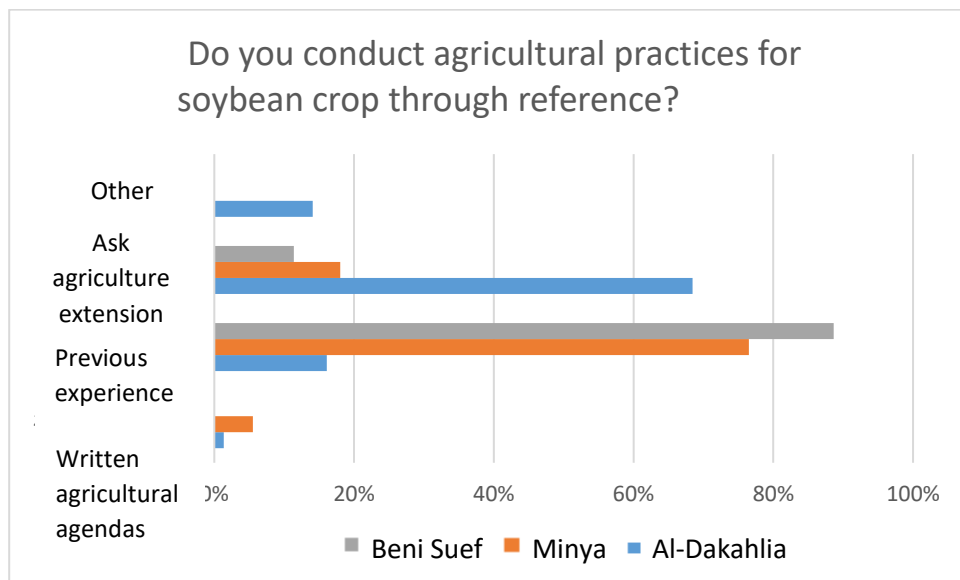
Eighth: Agricultural Agenda

1/8 Know the timing of agricultural practices for soybean crop.

Do you conduct agricultural practices for soybean crop through reference...

Do you conduct agricultural practices for soybean crop through reference	Al-Dakahlia	Minya	Beni Suef
Written agricultural agendas	1%	6%	0%
Previous experience	16%	77%	89%
Ask agriculture extension agent	68%	18%	11%
Other	14%	0%	0%

As mentioned earlier that the agriculture extension agent has a major role in Dakahlia than in other governorates. Furthermore, the handbook of growing soybeans should be distributed in other governorates to be the reference for them in the coming years.



KEY RECOMMENDATIONS:

First: Clean Cultivation Practices

- Cultivation at the recommended time avoids the emergence of diseases.
- Treatment of seeds with fungal disinfectants before cultivation.
- Avoid irrigation water overuse.
- Observing the periods of irrigation especially when the temperature rises and avoiding thirsting.
- Observing the Cultivation of seeds when soil moisture is appropriate.
- Non-cultivation of seeds in a shallow way in the soil.
- Non-cultivation of plants with high density because they are susceptible to some diseases.
- Remove the infected plants in the field so as not to produce infected seeds.
- Follow an agricultural cycle in areas known for its severe infection.
- The cleanliness of canals, waterways and furrows from weeds.
- Burning infected pods and plants after harvest.
- When spraying is required, it is necessary to spray fungicides between the period seedpod formation and it fullness.
- Avoid excessive use of nitrogen fertilization and pay attention to potassium fertilization.
- It is noted that the role of guidance is very weak in Beni Suef where the role of traders plays a large role in raising awareness of farmers, it should be paid attention to aware the same traders and the role of guidance shows clearly in Al-Dakahlia. Therefore, they should be trained well.

Second: Practices of Increasing Protein or Oil

- The cultivation date should be in early time.
- Choose recommended seeds.
- If the cultivation is for the production of seeds, the cultivation should be delayed to increase the proportion of protein over the oil.

Third: Loss Reduction Practices

- Determine the maturity markers of the crops accurately.
- Harvest in the early morning.
- Put the seeds on plastic sheets, mix it, and protect it from birds.
- Non-use of the thresher and use of the mechanical thresher with suitable sieve holes for seeding.
- The crops should be placed in small and not large piles.
- Soybeans should be covered with gauze designated for this when carriage in bulk.
- Fill the soybean seeds in proper plastic gunnysacks.

Fourth: Post-Harvest Soybean Handling and Storage Practices

- Storage on wooden boards is a good practice where it keeps seeds away of moisture and water and does not affect the quality of the seed.
- Soya bean dried remains should be assembled after maturity date in small piles.
- An appropriate torsion machine should be used for soybeans grains.
- Place the grain on a plastic sheets and be left to dry for 48 hours.
- Grains can be sifted to separate whole grains from broken, clay blocks and small plant stalks.
- Packing grains in clean plastic gunny sacks and store them in well ventilated areas.
- When requesting the carriage of soybeans in bulk without gunny sacks, appropriate transport vehicles should be selected and gunny sacks should not be placed on the floor of the vehicle.
- Soybeans should be covered with designated gauze when carriage in bulk.

Fifth: Green Grain Percentage Reduction Practices

- From 90 to 100 days is a proper life span, after which the irrigation shall be stopped not to affect the quality of the crops.
- It is better to add phosphate fertilizer when the service and processing of the land i.e. before the cultivation so that the plant benefits better when growing and absorbs it from the land.
- One of the practices that the farmer should follow, as this affects the quality of the seed, so awareness should be raised on this as it works to increase the weight of the seed and protect from *Spodoptera littoralis*.
- Select approved type seeds such as Seed C111.
- Upon noting that the rate of germination is weak, there should be no significant replanting where there is uneven maturity of pods.
- Ascertain the signs of maturity before harvest and stop irrigation completely.
- Ensure to apply the fertilization of superphosphate during the service.
- Potassium spraying.

Sixth: Quality of Irrigation Process

- The number of irrigations can be more than 4 in the case of high temperatures but not less than 4. Most farmers do so.
- The use of diesel with irrigation water is good practice, where it reduces the infection of *Spodoptera littoralis*, but many farmers do not use this practice due to the high price of diesel fuel, but if the disease will emerge, they will spend a lot over pesticides.
- The cultivation on the benches is a new non-widespread and very important practice and it should be spread as it reduces the irrigation water consumption by about 30%. Soybeans can be grown on wheat benches and therefore reduce the cost of processing the land as well.
- The laser land levelling should be disseminated, where 100% of the soil is level, thus reducing the loss of irrigation water and the levelling with tractor is a good practice but not like the laser leveling efficiency.
- The lining of the sub-irrigation canals is very useful but needs large budgets but it helps greatly in rationalizing the irrigation water and also reduces the diseases resulting from the presence of weeds.

Seventh: Agricultural Agenda

- The agriculture extension agent has a major role in Dakahlia than in other governorates. Furthermore, the handbook of growing soybeans should be distributed in other governorates to be the reference for them in the coming years.