Resource Material for Homestead Food Gardeners

Chapter 2: Handouts (English)

1. Farmer Experimentation

In farming, we will face new problems all the time and we need to try different ways of solving them. We may also want to try out new ideas. We need to try these new ideas without taking risks and without making more problems or difficulties for ourselves. We can do this by experimenting.

An experiment is a test to see if an idea or a solution works. When we have worked out what our problem is and the causes of this problem, we can come up with ideas or solutions to this problem. We can then do an experiment to see if our ideas really do work. We do the experiment on a small scale at first, in case the experiment does not work, and the whole crop is ruined.

Here is an example of Mrs Ngobese from KwaHlongwa (Umzumbe, South Africa). She decided to experiment with methods of controlling aphids on her cabbage crop. She has heard of two things she could try. The first was to put ash on the leaves of her cabbages, and the other was to spray chilli-soap on her cabbages. These were solutions to aphid control that she could try by herself, without spending a lot of money.

Mrs Ngobese took a small piece of her garden (1/10th) as the experimental plot. She divided the plot into 3 sections and marked them out very carefully.

1. On the first one she sprinkled ash on her cabbages.
2. On the second one she did a control. This means she did not try out one of her solutions here because she was trying to see if her solutions really worked. In other words, she wanted to make sure that the solution was better than doing nothing
3. On the third one she sprayed a chilli-soap solution.

Then she monitored and looked at her experiment. Every week she checked her cabbages and wrote down how many aphids the cabbages had. She did this so that she could remember exactly what happened, and at the end she could decide which method was better.

Here are her results:

Week	**1** **Ash**	**2** **Control**	**3** **Chilli-soap**
1, 2 and 3	No aphids	No aphids	No aphids
4	Sprinkled ash when aphids appeared	Aphids appeared; about 10 on each plant. Only some plants have aphids	Sprayed chilli-soap when aphids appeared
5	Still some aphids, about 5 per plant	Now aphids on all the leaves; about 100 per plant	Aphids seem to have disappeared
6	More aphids. Aphids appearing on plants that did not have them before. Sprinkled ash again	Aphids on the plants that did not have aphids before	More aphids. Aphids appearing on plants that did not have them
7	Fewer aphids. Some plants free of aphids. Hot weather, leaves look scorched. Was it the ash?	Aphid infestation now on all the plants. Hot weather, no scorching	Fewer aphids, some plants free of aphids. Hot weather, no scorching
8	The scorched/burnt leaves have been pulled off and plants are still growing - few aphids	Plants not growing well. Aphids seem to move from here onto the ash and chilli-soap plots.	Few aphids, but increasing
9	Aphids increased slowly after heavy rain. Did not use more ash	Decided to pull out the control plants, as they were not growing and they were	Aphids increased rapidly after heavy rain. Sprayed again.

		infesting the other two plots	
10	Some aphids on all plants, but not too many		Very few aphids. Plants are starting to head
11	Suddenly more aphids. Difficult to use ash with plants now heading, but did try to sprinkle some		More aphids. Plants are starting to head. Sprayed again.
12	Harvest		Harvest
RESULTS	Some aphids, heads now have ash on them and some do not look that good.	No heads. Plants destroyed by aphids	Very few aphids on plants, good heads on them.

She thought that another way of checking to see whether her experiment had worked was to weigh some cabbages at the end of the experiment. She weighed 10 cabbages from each section.

She wrote down her results in the table below.

WEIGHT IN KGs PER CABBAGE	**Ash**	**Control**	**Chilli-soap**
	Cabbage number	Cabbage number	Cabbage number
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	0.85kg 0.56kg 0.55kg 0.81kg 0.33kg 0.76kg 0.54kg 0.59kg 0.62kg 0.88kg	1- 2- 3- 4- 5- 6- 7- 8- 9- 10-	0.75kg 0.82kg 0.59kg 0.62kg 0.86kg 0.88kg 0.45kg 0.73kg 0.55kg 0.65kg
TOTAL	6.49kg	0	6.90kg

At the end she wrote down what she thought about each method: Which way of controlling aphids worked best for her. This was her final outcome. From this experiment Mrs Ngobese knows which method of aphid control works best for her. In future, she will use this method on all of her cabbages, not just a few of them

Ash	Control	Chilli-soap
What do I think: There is still some ash on the cabbage heads, as some ash got into the folds of the leaves. I think that the ash might have scorched the cabbage leaves. Also the ash gets washed off in the rain, and I have to apply it again.	**What do I think:** There were so many aphids that I had to take out all the cabbages in the control section, and so they cannot be weighed. I think they would not even have formed heads. Using ash or chilli-soap is definitely better that doing nothing at all.	**What do I think:** The cabbages from this plot look the best and weigh the most. I had to spray the solution every two weeks, especially if it had rained. Chilli-soap seems to kill the aphids, which is good because then they cannot go on to other plants. I will use chilli-soap in future.

Let's think more about what Mrs Ngobese did. You can use her example to plan experiments in your garden.

We will use this picture to help you with your experiments.

Whenever you see this picture, it will be time to think about how you can experiment in your garden to get better results.

In doing her experiment, Mrs Ngobese asked herself some questions, and then answered them

1. **First of all, she asked what her problem was.** The answer is that she had aphids on her cabbages and she thought this was bad.

2. **What is a solution to this problem?** Mrs Ngobese thought one solution was to sprinkle ash on her cabbages, and another solution was to spray her cabbages with chilli-soap mixture.

3. **Why will this solution solve the problem?** Mrs Ngobese thought that these solutions would get rid of the aphids

4. **How will I test this solution?** Mrs Ngobese put ash on some cabbages, and chilli-soap on other cabbages, and did nothing at all on the rest of her experimentation plot. She then counted the number of aphids.

5. **How will I check my results?** What will I look for? Mrs Ngobese checked the number of aphids on her cabbages every week, and she wrote down what she found. She found that her control plot had many, many aphids and that with ash and chilli-soap she could reduce the number of aphids, as long as she applied this every two weeks.

6. **How else will I check my results?** What will I measure? Mrs Ngobese weighed 10 cabbages from each section at the end of the experiment at harvest time. She found that the 10 cabbages with ash treatment weighed 6.49 kilograms and the 10 cabbages with chilli-soap treatment weighed 6.9kg. This means the cabbages treated with chilli-soap weighed more. She did not keep her control cabbages to weigh.

7. **How will I measure the results or outcomes?** The cabbages with the fewest aphids or the cabbages that weigh the most will be the best.

8. **How will I compare my experiment to my usual way of farming?** Mrs Ngobese's usual way of farming was to do nothing about aphids, like she did on her control section. From this experiment, she has seen that both ash and chilli-soap mixture reduces the number of aphids on her plants. She has seen that she needs to re-apply both, especially when it rains. Now she thinks that chilli-soap mixture is the best way of controlling aphids on her cabbages.

In the following table you will find the questions for planning your experiments, and space to write your answers.

Small scale experimentation plan	
1. What is the problem?	
2. What is a solution to this problem?	
3. Why will this solution solve the problem?	
4. How will I test this solution?	
5. How will I check my results.What will I look for?	

6. How else will I check my results.What will I measure?	
7. How will I measure the results or outcomes?	
8. How will I compare my experiment to my usual way of farming?	

When doing experiments it is important that you can measure your results, and judge whether the experiment has worked or not. If you try too many things at once, without thinking about how you can measure the results, you might not know which solution has worked. This is what happened in the following story

THE BACKACHE

END OF THE BACKACHE STORY

The same thing would have happened to Mrs Ngobese if she had sprinkled ash and sprayed chilli-soap on her cabbages at the same time. She would not have known which method was better at controlling aphids.

One good thing about doing experiments is that you can share your knowledge with your friends and neighbours, and this might help them. If they do experiments, they can also share their knowledge with you, so that you do not have to do the experiment yourself. In this way your community can decide what is best practice, and everyone can use that method of farming.