

# Pack 104, Item 10

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**Farmer makes his own biopesticide with neem**

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**Notes to broadcaster**

Dealing with pests is one of the facts of a farmer’s life. Insects and other kinds of pests not only swallow a farmer’s crop, but a farmer’s income too. Pests reduce yield and reduce the quality of the crop, which reduces income.

There are many ways to deal with pests. Many cultural practices, including crop rotation, planting “trap crops,” planting pest-resistant varieties, and hand-picking pests are designed to manage pests in the field, and to keep pest populations small enough that the damage they cause is minimal.

Sometimes, farmers might need to use pesticides. There are many types of pesticides, but the most common types are herbicides, insecticides, and fungicides, which control weeds, insects, and fungal diseases. Another way to categorize pesticides is to divide them into chemical pesticides and biological pesticides, also called *biopesticides*.

Biopesticides can be as effective as chemical pesticides, though they are usually less persistent in the environment, and farmers need to reapply them. They are usually less expensive and they are much less damaging to human health and the environment. Indeed, they provide the insects and other creatures who prey on or parasitize crop pests with a better environment than chemical pesticides, whose effectiveness can be limited by pest resistance and weather conditions.

This script tells the story of a farmer from Cameroon who learned to make his own biological pesticide by using different parts of the neem tree, whose scientific name is *Azadirachta indica*.

The farmer gives details on how to make and use his neem-based insecticide to control insect pests in his vegetable crops.

You might choose to present this script as part of your regular farming program, using voice actors to represent the speakers. If so, please make sure to tell your audience at the beginning of the program that the voices are those of actors, not the original people involved in the interviews.

You could also use this script as research material or as inspiration for creating your own programming on using alternatives to chemical pesticides for managing pests.

Talk to farmers, extension agents, and researchers. You might ask them:

* What are the main pest problems in your area and how do farmers usually address them? Are there farmers in your area who have used natural or biological pesticides to manage pests? What were the results? What were the successes, and what were the challenges?
* How is using a biological pesticide different from using a chemical pesticide?

Estimated running time for this item is 15-20 minutes, including intro and outro.

**SIGNATURE TUNE**

**HOST: Good morning, dear listeners. Today, we will talk about biological pest control. In Maroua, a town in the Far North Region of Cameroon, farmers use an innovative method to control pests. It is a biological insecticide, or biopesticide, made from neem, a tree which grows everywhere in the area. The neem tree was introduced to Maroua ten years ago during a tree planting campaign conducted as part of the struggle to fight desertification. At first, people planted the tree for shade. But as time went by, they discovered that all parts of the neem tree have valuable qualities and functions.**

**Today, we are with a farmer who uses neem, Mal Awal Birni. Can you introduce yourself to our listeners?**

**MAL AWAL BIRNI: Hi, my name is Mal Awal Birni. I am 43, and I farm in Maroua. I also raise animals and sell chickens and farm produce every Sunday.**

**HOST: Do you know this tree called neem?**

**MAL AWAL BIRNI: Yes. In my native language *Massa*, we call it *nimma*. But neem is commonly called. When you say “neem,” many farmers don’t know exactly what you are talking about. In my area, neem is called *gayne*.**

**HOST: You use neem as a biopesticide. Can you tell us more about this?**

**MAL AWAL BIRNI: Yes. I use neem as an insecticide. I make it myself and have used it for five years. I am satisfied with the results.**

**HOST: Since you make the insecticide yourself, we will go with you to see how you make it.**

**MAL AWAL BIRNI: OK, let’s go. I work in the backyard.**

**SFX: FOOTSTEPS MOVING AWAY. PAUSE. SOUND OF FLOWING WATER.**

**HOST: We are in Mal Awal Birni’s backyard. He is getting ready to make a biopesticide with neem. Right now, he is gathering all the tools he needs. Mal Awal Birni, can you explain to us what you are doing?**

**MAL AWAL BIRNI: I am going to prepare an insecticide by using neem bark. At the end of the process, I will get a kind of liquid, which I spray on my cabbage and my tomatoes.**

**First, I collect neem bark. Today, I will make the insecticide without using measuring tools. But, to make five litres of neem solution, you need one or two small branches.**

**HOST: What do you do with the bark?**

**MAL AWAL BIRNI: You simply let the bark soak in water for two or three days. Then, you use the solution to spray your vegetables. In this case, you use it only as a precaution before the plants have been attacked. You can use the solution once a week.**

**HOST: What should you do if the plants have already been attacked?**

**MAL AWAL BIRNI: When the plants have already been attacked by pests, you need to prepare a thicker solution, with more neem, but with neem leaves this time. You should soak about one kilogram of neem leaves in five litres of water. One kilogram of neem leaves is about five double handfuls for a person with big hands. If you have smaller hands, like many women, it might be six double handfuls.**

**HOST: Can you show us how to make this thicker neem leaf solution?**

**MAL AWAL BIRNI: Of course! We crush the leaves in a mortar before mixing them with the water. Then, we let the mixture steep until the next day. Later, we filter the liquid to remove the leaf residues. Then, we divide the solution into two equal parts and add 50 litres of water and a handful of grated household soap to each part. We pour as much of the mixture into a spray bottle as possible, and the insecticide is ready. We refill the spray bottle as necessary.**

**So you need five litres of water and one kilogram of neem leaves to produce 100 litres of biopesticide. I should tell you that the soap has no impact on the effectiveness of the solution. The soap only helps makes it easier to use.**

**HOST: How much crop area can you treat with 100 litres of the neem solution?**

**MAL AWAL BIRNI: Usually, 100 litres is sufficient to spray one hectare once. You spray the tops and undersides of the leaves, plus the stems, the soil, and the area around each plant.**

**HOST: Which pests do the neem solutions effectively manage?**

**MAL AWAL BIRNI: It is effective for all the crops I grow. For example, pests often used to eat the inside of the cabbage without us noticing it. Then one day, we discovered that the cabbage plants were rotting. Also, pests chewed on developing seedlings, which died later. There are also diseases which attack leaves. Some leaves are pierced, others dry out.**

**From experience, I have noticed that the neem solution is effective for French beans, tomatoes, cabbage, carrots—and vegetable crops in general. We spray the solution every ten days or once every two weeks. This is what we use after the plants have been attacked.**

**HOST: What other purposes does neem have as an insecticide?**

**MAL AWAL BIRNI: I use neem leaves to keep insects out of the grain warehouse.**

**HOST:** How does it work?

**MAL AWAL BIRNI: I add dry leaves to every corner of the store and also between bags of grain.**

**HOST:** And this protects your seeds?

**MAL AWAL BIRNI: Yes, the seeds are protected. But for it to work, I must clean the seeds first. Neem leaves do not kill insects; they just repel them. First, you must dry the grain well, and make sure you remove all mouldy grain before putting the good grain in storage bags.**

**HOST:** Can we see?

**SFX:** SOUND OF FOOTSTEPS. A DOOR OPENS.

**HOST: We are in Mal Awal Birni’s warehouse. Many bags are piled on top of one another. An aisle separates each pile of bags. (TO MAL AWAL BIRNI) Can you explain to us why you have arranged the bags this way?**

**MAL AWAL BIRNI: The store must be ventilated. This is why we left an aisle between each pile of bags. And people must be able to move around among the piles in order to clean and place dry neem leaves in every corner of the store. I can store grains for one year without being afraid of losing anything. But neem is not effective for long, so it’s important to keep an eye on the storage bags, and repeat the neem treatment regularly every few weeks.**

**HOST:** Where did you learn all these tips?

**MAL AWAL BIRNI: I attended a training seminar with other farmers five years ago. Every year, various types of pests threaten our crops. So they trained us how to use neem to control these pests. In turn, those who were trained taught other farmers. This is how we shared the techniques.**

**HOST:** So you train other farmers?

**MAL AWAL BIRNI: Yes, I share my knowledge with others. I have already trained a lot of people. Some of them completed their training later through other workshops, and are now capable of producing other types of insecticides, such as those made with neem oil.**

**HOST: Dear listeners, we will now meet someone who was trained by Awal. This person has tested the biopesticide for two years.**

**SFX:** SOUND OFFOOTSTEPS, PAUSE, THEN SOUND OF WOMEN SINGING.

**HOST: We are in a courtyard where seven women are working and singing. Mal Awal Birni talks with one of them for a few seconds, then introduces me to her.**

**MAL AWAL BIRNI: This is Aissatou Koloba. She chairs a commercial interest group, made up of female farmers. The members of the group are producing neem oil.**

**HOST: Good morning, Aissatou. Can you explain to us what you are doing?**

**AISSATOU KOLOBA:** Hello, everybody. We are making neem oil. We make it with neem seeds.

**HOST:** Please explain how you make it.

**AISSATOU KOLOBA:** We dry neem seeds in the shade for about three weeks. To avoid any kind of contamination, it’s important to not dry seeds in the sun or on the ground. We dry them on a mat, which is why it takes three weeks to get fully-dried seeds. When they are dry, we crush them in a mortar to remove their shells before drying them once again. After the second drying, we grind the seeds in a mill, for example, a maize mill. Once we get powder, we add water and press the paste to extract the oil you see now.

**HOST: (TO LISTENERS) Indeed, we can see women pressing the paste, rolling it up, then pressing it once again with their hands. As they continue pressing the paste, drops of oil start to appear. (TO AISSATOU KOLOBA) Once you have the oil, how do you use it?**

**AISSATOU KOLOBA:** To produce 15 litres of neem oil solution, you put one litre of water in a container, add a spoonful of grated soap, and mix vigorously with your hands until the water starts foaming. Then, you add 50 millilitres of neem oil to the mixture. If you don’t have a measuring spoon that measures millilitres, you can just add five tablespoons of the neem oil. You stir the mixture again and then add 14 litres of water— and your solution is ready.

**HOST:** What surface area can 15 litres of neem oil treat?

**AISSATOU KOLOBA:** Fifteen litres can treat one-and-a-half hectares of a crop. We decided to use 15 litres because most household containers here are 15-litre buckets.

**SFX:** SOUND OF WATER BEING SPRAYED

**AISSATOU KOLOBA:** Once you mix it with water, it is important to use neem oil within five hours at the latest. You just spray the mixture on the underside and tops of the leaves, on the stems, and on the soil near the plants and the soil around the plants.

**HOST:** When is the right time to use the neem oil spray?

**AISSATOU KOLOBA:** As a preventive method, it’s best to start spraying the day after sowing. If you do that, you can spray again once every three weeks. If you start spraying later because you notice something unusual in the crop or you suspect that the plants are under attack, then you must use the solution once every ten days.

**HOST: How effective is this product? Can you share your experience?**

**AISSATOU KOLOBA:** When you start spraying the day after sowing, the solution is effective at protecting the plants. Last year, I did not have problems like I did in previous years. Two years ago, I lost almost all my cabbage crop. All the leaves had been eaten and some had dried out. That happened within only a few days. I went to my sister’s for three days because she had lost a relative, and when I came back, I didn’t recognize my field. More than half of the cabbage plants were under attack.

The only inconvenience with the neem oil is that you must apply it from sowing to harvest. We learned that neem does not kill pests. It just repels them. So, as soon as the active ingredient completely evaporates, pests come back. This is why you need to repeat the sprays every few weeks.

**HOST: What is the benefit of using neem oil? Why did you choose neem oil instead of leaves or soaked branches?**

**AISSATOU KOLOBA:** Oil can be stored longer before it is mixed with water to make a solution, for many weeks. You need to use a solution made with branches or leaves within eight hours.

Besides, you can use neem oil in daily life. For example, you can use neem oil for farming, caring for newborns, for diaper rash, or to treat children’s scalps when they have ringworm. So the oil is more useful for us.

**HOST: Now that we learned about the various ways that a farmer can use neem in farming, we need to understand what makes this plant so effective at controlling pests.**

**We will meet Mrs. Carine Mala Poaka, a research teacher at the University of Maroua. She works on some programs with the Institute of Agricultural Research for Development, or IRAD, which is part of the Ministry of Scientific Research in Cameroon.**

**Mrs. Mala Poaka, what can you tell us about using various neem solutions for pest control?**

**CARINE MALA POAKA:** Using insecticides made with neem is an old practice, which is more and more promoted with farmers.

**HOST: Farmers say that neem does not kill pests, but only repels them. So, do you need to spray regularly?**

**CARINE MALA POAKA:** Yes, neem contains an active ingredient called azadirachtin, pronounced a-zad-i-rak-tin. This substance doesn’t kill insects. Instead, it interferes with their hormones and prevents them from developing normally.

**HOST:** Does sun change the effectiveness of neem? We heard that it is recommended to dry neem seeds in the shade rather than in the sun.

**CARINE MALA POAKA:** First, it is important to collect seeds when they are well-ripened, and preferably when they are yellow. At this stage, their azadirachtin content is highest. Azadirachtin is very sensitive to sunlight, which reduces its effects. This is why you must dry seeds in the shade.

**HOST: What types of pests does neem manage?**

**CARINE MALA POAKA:** It is effective for a wide range of pests, especially leaf-eating insects like caterpillars, locusts, and weevils, as well as stem borers, pod borers, small fruit flies, scale insects, aphids, and thrips.

Neem insecticide is effective for pests which attack, among other things, greens, vegetable crops, cotton, seed crops such as sunflower and sesame, rainfed crops like millet and sorghum, some species of palm oil trees, and even some pests of stored grain.

**HOST: What is its impact on human health and the environment?**

**CARINE MALA POAKA:** Neem insecticide is entirely biological, even if some chemicals are added to it from time to time, and it is less harmful than chemical pesticides. There are no side effects on human health or the environment. It is quite the opposite. Indeed, it has numerous benefits both for human health—there is no risk of poisoning—and the environment, as neem cake can be used to improve the soil.

**To sum up, I would say that insecticides made with neem, regardless of the type of mixture or whether you use neem seeds, bark, leaves, or roots, are effective for protecting growing crops and stored crops.**

**A biopesticide made with neem can be used as a precaution or a remedy because it deters pests from feeding on treated plants, it prevents larvae from developing, and it repels pests and prevents them from growing.**

**Because it doesn’t persist long in the environment, it is recommended that farmers apply the appropriate dose many times during a season, every few weeks.**

**HOST: Dear listeners, we are at the end of our program. Today, we talked about biopesticides made with various parts of the neem plant.**

**We learned how to make a biopesticide to control pests which invade fields. Farmers can use neem bark and leaves to prepare a liquid which is sprayed on plants. You can also make neem oil with neem seeds and dilute the oil with water to spray plants. Neem oil has the benefit of lasting longer and having many household uses.**

**You can use neem insecticide to protect plants from attack, or use it after plants have been attacked. Remember that neem insecticide does not kill pests; it only repels them. So, when it evaporates, you must spray it again, every few weeks. It is safe and it is effective against a wide variety of pests.**

**For more information on making and using neem insecticides, contact your local extension agent.**

**Thanks for listening, and we hope you learned a lot. See you soon!**

## Acknowledgements

Contributed by: **Anne Mireille Nzouankeu, Cameroon**

Reviewed by: Carine Mala, Assistant Professor, University of Maroua, Cameroon

**Sources of information**

**Interviews:**

**Mal Awal Birni, February 22, 2016**

Aissatou Koloba, February 23, 2016

Carine Mala Poaka, March 28, 2016

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