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**Getting it right: The right way to apply fertilizer**

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**Notes to broadcasters**

Fertilizers provide essential nutrients needed by the soil for plants to be healthy and have vigorous growth. However, applying fertilizers effectively remains a challenge in Africa, and Ghana is no exception. This has contributed to the low productivity of crops over the years.

To help farmers, there have been many projects by governments, NGOs, and others in the agric sector to subsidize fertilizers to farmers in Ghana and to train them on best practices for applying them.

In this script, you will learn more about the 4Rs for applying fertilizers, which some small-scale farmers in northern Ghana have been trying. These methods, thankfully, have led to an appreciable increase in quality and yield of their crops.

The script includes interviews with farmers as well as some experts on the best ways to apply fertilizer.

You might choose to produce this script on your station, 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.

If you are creating your own programs on recommended practices for applying fertilizer, talk to agricultural experts, experienced farmers, and people who have experience with the 4R approach to fertilizer application. You may wish to ask them the following questions:

* What is the right source, time, rate, and placement of fertilizer for the most common crops grown in this area?
* What should farmers do when their preferred fertilizers are not available, easily accessible, or affordable?
* What practices can farmers use to ensure that fertilizers do not harm their own health or the natural environment?

Estimated duration with music, intro and extro, is 20 minutes.

**SFX:** Signature tune.

**HOST:** Hello, listener!! Welcome to another edition of the program for farmers, “Farm right.” Are you a farmer who has been experiencing low yields? Have you applied fertilizers to improve your yield but still not got the desired results? Could you be doing something incorrectly? Did you know that getting better yields from your harvest does not depend only on the size of your farmland?

**SFX:** Fade out Signature tune

**HOST:** Simply getting fertilizers into farmers’ hands is not enough. Rather, to increase yields, the solution is to show them the best way to apply fertilizers. The “4R” approach to fertilizer application is one recommended way of applying fertilizers. It has been successful in Canada, Mali, Niger, and Nigeria and has recently been introduced in northern Ghana. The approach includes using the “right source,” “right time,” “right rate,” and “right placement.” It’s about using fertilizers the right way to increase yields and minimize environmental harm.

Today, we will hear from experts and farmers in northern Ghana how they are getting increased and higher quality yields with the 4R approach to fertilizer application. Let’s get started with our first farmer, Mr. Bafani Moses. He is a small-scale farmer from Chamba in the Nanumba North Municipality of the Northern Region.

**HOST:** How long have you been a farmer?

**Mr. Bafani Moses:** I am a 46-year-old farmer with about 31 years’ experience in farming. I have a 10-acre maize farm, a 10-acre soyabean farm, and a 10-acre rice farm, as well as a three-acre groundnut farm, six acres for cassava, and a yam farm. Farming has been my only source of income to take care of my wife and seven children.

**HOST:** Could you share your experience of applying fertilizer with us?

**Mr. Bafani Moses:** At first, I didn’t know the type of fertilizer to use, the right time to apply it, or where to place the fertilizers and so on. Let’s take maize for instance. Most of us farmers were waiting for six weeks or more after planting until it was time for weeding. After we sprayed chemicals to clear the weeds, that is when we bought fertilizers and applied them. But even when we were buying them, we didn’t ask for a specific kind of fertilizer. For us, any fertilizer was ok, especially the ones with the lowest price. Whether the fertilizer was meant for rice, maize, or groundnut was the least of our concerns. We just bought any fertilizer for any crop.

**HOST:** And how did apply it?

**Mr. Bafani Moses:** I just mixed the fertilizer and with no specific measurement. Sometimes I just used a handful as a measure. I just dug 5-10 holes around the farm and added a handful of fertilizer to each hole. I and other farmers in my area knew that there were two types of fertilizers—NPK for growth and ammonia for quality grains. So we just mixed the two and applied it once.

**HOST:** Were you getting results after doing that?

**Mr. Bafani Moses:** As I mentioned earlier, farming is my only source of income. And honestly, for years I haven’t really enjoyed my farm because of the low yields I always got. I didn’t get a good income, and this brought unbearable financial challenges which made it difficult for me to take care of my family. I borrowed to farm but always operated at a loss because of low yields. I couldn’t even take my children to better schools. Hmm!!! It was terrible. If not for the support and understanding of my wife, my family wouldn’t have survived all these years.

**HOST:** So how did things change?

**Mr. Bafani Moses:** Being introduced to a better way of applying fertilizer called the 4Rs changed my life and that of my family. I was taught how to find the “right source” of fertilizer for the specific crop, the “right time” to apply the fertilizer, the “right rate,” to apply, and the “right place” to apply the fertilizer for my crop. And just within the first year of practice, I started seeing good results.

**HOST:** Really!! How?

**Mr. Bafani Moses:** Yeah, when I started applying the 4R principles, I had increased yields. I am just in my first year with 4R and I know it will become even bigger in subsequent years. Formerly on my 10-acre maize farm, I could only harvest seven or eight 100-kg bags. This means that after farming on my large piece of land, I got no profit. But now, I can harvest more than 50 100-kg bags of maize. This is just the first year, so you can imagine how good things will turn out in the coming years.

**HOST:** Tell us about your groundnut farm as well.

**Mr. Bafani Moses:** Groundnut was the worst of all. Previously, I used to get three to four 50-kg bags of unshelled groundnuts on my three acres.

**HOST:** You don't mean it!

**Mr. Bafani Moses:** Hmmm! That was what was happening. But by practicing the 4R principles, this year I got more than ten bags an acre. Now I am a happy man. If you come to my house today, you will see that something new is happening. I am currently expanding my house. My children are happy and always discussing the good things taking place in the house. I am seeing that farming can really yield profit when done properly.

**HOST:** So what can you say about these 4R principles that you were introduced to?

**Mr. Bafani Moses:** We were first educated on the types of fertilizers to purchase for each crop. We were taught that NPK fertilizer should be applied no later than14 days after planting. When you apply NPK early like this, your crops will start growing strong. And six weeks after planting, you can apply your urea to give you quality yields.

No good thing comes easy. But practicing the 4R principles is not stressful or difficult. Now I farm with happiness. Formerly, I used to get tired on the farm, but with 4R, I see results so fast that when I am weeding the whole day, I don’t feel exhausted. Why should I be stressed when I am seeing the good yields and reward for my time and energy?

**SFX:** sigtune FOR A FEW SECONDS, THEN FADE UNDER HOST

**HOST:** Hello!! This is the farmers’ program called “Farm Right,” with me your regular host. We are discussing the best fertilizer application methods and so far we have heard from Mr. Bafani Moses, a 46-year-old farmer who shared his experience before and after practicing the 4R method of applying fertilizer. Before we move on to our next farmer, we also have in our studios an agric expert who will explain what the 4Rs for fertilizer application are all about.

**HOST:** You’re welcome, sir, kindly introduce yourself.

**Mr. Jumah Bashiru:** My name is Jumah Bashiru. I work for SEND Ghana, that is, the Social Enterprise Development Foundation of West Africa. Currently, I am the project manager for a project that promotes the 4R principles.

**HOST:** It appears that farmers who are practicing the 4R principles are really happy about the turnaround. What is it all about?

**Mr. Jumah Bashiru:** You know there is no clear “one size fits all” approach to fertilizer application, but that is what 4R seeks to bring to agricultural practice. Fertilizer is all about nutrient management, and to do nutrient management, you need to understand what is available in the soil and what is not available.

Unfortunately, that is not what is happening in our system. Many farmers who want to grow maize and apply fertilizer don’t know anything about the soil and don’t even take the maize crop into consideration. They go to the market, buy any fertilizer, and apply. When you do that, you will not get the expected yields. So the 4R principles are about bringing a scientific approach to nutrient management.

**HOST:** Kindly take us through all what 4R is really about.

**Mr. Jumah Bashiru:** So the 4Rs for fertilizer use are basically about using fertilizer in the right way to maximize yields and minimize environmental damage.

The first R is the “right source” of fertilizer. This means using the fertilizer with the right combination of nutrients. Does the farmer need a fertilizer that is low in nitrogen or one that is high in potassium? Or one that is high in phosphorous, or has other nutrients. So you need to get the fertilizer from the right source. The recommended fertilizer is informed by the soil type, the location, and the type of crop. Your local extension officers can also help farmers with this.

For example, most soils in northern Ghana are very low in nutrients. Because maize requires a lot of nitrogen, it must be supplied with higher amounts of nitrogen. But groundnut is a nitrogen-rich plant. So it needs low amounts of nitrogen as a starter but higher amounts of potassium and phosphorous.

So, for maize, we would recommend an NPK with sufficient nitrogen, phosphorus, potassium, and other micronutrients. Examples are NPK 11-22-21, NPK 20-10-+10, NPK 11-22-21 plus micronutrients, NPK 23-10-5 plus micronutrients for cereals, and NPS 14-31-0 for legumes such as groundnut and soybean.

In addition to finding the right source, farmers should get fertilizers that are rich in other nutrients that plants need in small quantities, including zinc, boron, sulfur, and magnesium. These micronutrients help the macronutrients nitrogen, potassium, and phosphorus to work better.

**HOST:** Now that we know about the right source of fertilizer, what’s next?

**MR. JUMAH BASHIRU:** That takes us to the second “R” which stands for “right time.” What is the best time to apply the fertilizer? Not later than two weeks or 14 days from the time of sowing, when soil is moist, you have to apply your NPK. This is the basal application which includes other micronutrients such as sulphur and zinc. This is very important as emerging seedlings need starter nutrients for good growth and development. Then, four weeks after the basal application, we do the second fertilizer application using nitrogen-rich fertilizers like urea, and others. This is what is referred to as top dressing. So the timing is very important. If you apply fertilizer at the wrong time, you may not get the best yields.

**HOST:** Wow!!! Very educative. I believe our listeners are eager to know about the remaining “Rs.”

**MR. JUMAH BASHIRU:** The third “R” stands for “right rate.” You already know the right source and the right time to apply, so your next consideration is: what quantity should you apply? Farmers can use various objects to measure fertilizer, such as the cork of a mineral water bottle. But unfortunately, most farmers often apply it with their bare hands. When we talk about the right rate, we have to consider the nutrient content of the fertilizer. Different fertilizers contain different rates or quantities of nutrients. Farmers should apply between 4-6 50-kg bags of NPK and 2-3 50-kg bags per hectare for maize and rice, depending on the type of fertilizer.

The final R is “right place.” Where should you place the fertilizer so that the plant can make the best use of it? Most farmers just broadcast fertilizer or pour it near the plant. But the best method is to dig and bury it. You dig a hole at least one finger length away from the plant and half a finger-length deep, pour the fertilizer inside, and then cover the hole. With this method, the plant will feed on the nutrients bit by bit. If you just spread it out and expose it to the weather, you may lose the nutrients through evaporation to the atmosphere and leaching into water bodies.

**HOST:** How do fertilizers leach into water bodies?

**Mr. Jumah Bashiru:** A lot of fertilizer leaks into water bodies due to bad agricultural practices, for example, adding too much fertilizer or leaving it on the surface of very moist soil. So practicing the 4Rs doesn’t only help to increase yields but it also minimizes environmental damage.

**HOST:** Can this 4R process be applied to other crops or just for maize, groundnut, and sorghum?

**Mr. Jumah Bashiru:** The 4R approach to applying fertilizer is the way to enable crops to make the best use of fertilizer. It cuts across all crops and can be used on all soil types. The aim of the 4R principles is to help farmers apply fertilizers in the right way for every crop and every soil. However, farmers should consult the nearest extension office for advice that is tailored to their specific crop and soil.

 Over time,we have degraded our soils due to poor farming practices, bush burning, poor land tillage, and improper application of chemicals such as herbicides and pesticides. Nitrogen, potassium, and phosphorus in the soil are all low. So to enhance your yields, you have to apply fertilizers to replenish the soil.

**HOST:** Does this 4R approach apply to all types of fertilizers?

**Mr. Jumah Bashiru:** The 4R approach can actually be applied to both inorganic and organic fertilizers. By combining the 4Rs with effective, sustainable agricultural practices, a farmer can be assured of the best yields.

**HOST:** Are the 4Rs difficult for farmers to implement?

**Mr. Jumah Bashiru:** Because the process is scientific, it requires a lot of diligence and time, and can be labour-intensive. For example, you cannot practice 4R and not plant in rows. Planting in rows makes weeding and harvesting easier. Most farmers find it difficult to adjust to new practices. So the challenge is more about changing attitudes. For example, farmers see measuring fertilizers as a lot of work. But when they practice it and see the results, they realize that it’s not as difficult as they thought. It’s better to farm effectively on two acres than to plant on four or five acres and not follow the recommended ways of applying fertilizer.

**HOST:** Some members of the public think that produce from crops fertilized by inorganic fertilizers is unhealthy.

**Mr. Jumah Bashiru:** Let me reiterate that 4R is concerned with the proper way of applying fertilizer. As you know, agricultural produce around the world is grown with fertilizers. 4R is about the proper way of applying them. Fertilizers with micronutrients go a long way towards boosting quality and grain size. Pods are well-filed, and grains can be milkier, firmer, and healthier. As a country, Ghana’s consumption of fertilizers and sprayed chemicals is very low. But the real problem is wrongful application. For example, if a farmer sprays tomatoes or pepper, he must wait 10 days before marketing them. But some farmers spray today and take their produce to the market the next day. So the problem is proper application. That is why farmers should be encouraged to abide by the principles of 4R and other recommended agronomic practices.

**HOST:** Many thanks, Mr. Bashiru, for this comprehensive education. Let’s have another farmer share her experience with the 4R principles of applying fertilizers.

 Hello madam, can you please introduce yourself?

**Mrs. Joyce Nyamekye:** My name is Joyce Nyamekye. I come from Jamboi, in the Kpandai district of the Northern Region. I have an acre each of maize and groundnut. I have more than eight children. I was faced with a lot of challenges taking care of my family because, even though I invested money and my strength in the farm, I had nothing at the end.

**HOST:** Please share your experience with 4R with us.

**Mrs. Joyce Nyamekye:** I am pleased to have been introduced to these 4R principles for fertilizer application. Previously, I didn’t even know that groundnut would benefit from fertilizer, and I didn’t know how to apply it properly. I didn’t know which type of fertilizer will be good for this crop or that crop. I also thought that maize should grow 3-6 feet high before fertilizer is applied; we didn’t know that within two weeks of planting, fertilizers must be applied. But following the 4R principles, I now know the appropriate fertilizer for groundnut or maize, where to apply the fertilizer, and the quantity to apply. We were using our bare hands, but now I know that I have to measure with the cork of a mineral water bottle.

**HOST:** Could you share your experience with the other farmers listening to us?

**Mrs. Joyce Nyamekye:** I divided my one-acre groundnut farm into two. One was cultivated with 4R principles and the other was not. I did the same for my maize farm. I received better yields from the plots where I used the 4R principles.

Before 4R, a farmer could plant 4-5 acres and yield only 3-4 100-kg bags of maize. This meant we were misusing and wasting the land and our energy for nothing. But now one acre yields 18 bags. Last year when I planted maize on one acre, I had only six bowls, not even one bag. But this year, I had more than 12 bags. Even though I didn’t start the 4R principles early, I had a good result so I know the future is bright.

**HOST:** All too soon, another episode of the program has come to an end. Today, we learned about the 4Rs for applying fertilizer. If you are a farmer and you are not seeing positive results on your farm, you should consider applying 4R principles when you next plant.

The resource persons who helped us appreciate and understand the 4R principles were farmers Mr. Bafani Moses and Mrs. Joyce Nyamekye from northern Ghana and agric expert, Mr. Jumah Bashiru.

 To summarize what we heard from all our resource guests, the size of your farmland is irrelevant if you continue to plant without a recommended way of fertilizer application. With the right approach, you can farm on a small piece of land and still get the desired yields to better your life as a small-scale farmer.

 Many thanks to our resource persons and to you our listeners for making today’s program a success. Enjoy the rest of the week until we meet same time next week. Bye!!!!!

**Acknowledgements**

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Interviews:

Bafani Moses, farmer, January 10, 2021

Joyce Nyamekye, farmer, January 13, 2021)

Jumah Bashiru, SEND Ghana (Social Enterprise Development Foundation of West Africa) January 6, 2021

Dr. Askia Mohammed, researcher and soil scientist, Council for Scientific and Industrial Research (CSIR), January 8, 2021

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