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# Innovations in Soil and Plant Nutrient Management

## How to Improve Fertilizer Recommendations for Farmers?

**Dinesh Panday**







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Innovations in Soil and Plant Nutrient Management | 20 October 2022







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Home » Econ-ity Blog » The Perennial Problem of Fertilizers Shortage in Nepal: Is the government acting as a hurdle?

## The Perennial Problem of Fertilizers Shortage in Nepal: Is the government acting as a hurdle?

Posted on October 12, 2022



Nepal is an agricultural country, and fertilizers are a critical component of agriculture; however, fertilizer shortage is a chronic problem in Nepal. Numerous policies, such as Working Policies, Subsidy Policy, Deregulation Policy, National Fertilizer Policy, and Chemical Fertilizer Subsidy policy, were introduced from time to time to address this, but none of them were found to be fully effective. Fertilizers are still not available to farmers at the time of harvesting, and if they are, they are untimed, inadequate, and adulterated in nature.

## Rethink Fall N in Wheat

Are We Overfeeding Wheat With Fall Nitrogen Applications?

10/28/2021 | 8:59 AM CDT



By [Emily Unglesbee](#), DTN Staff Reporter

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Many soils already hold enough nitrogen to get winter wheat through the fall and winter, which means fall nitrogen applications rarely pay off. (DTN file photo by Elaine Shein)

ROCKVILLE, Md. (DTN) -- With nitrogen supplies tight and costs skyrocketing, there's never been a better year to take advantage of wheat's minimal fertilizer needs in the fall.

Take it from Marc Arnusch, a Colorado farmer who discovered he was overfeeding his wheat crop with nitrogen, in an effort to get the crop up and headed toward its optimal yield.

"We used to put nitrogen on in the fall religiously," recalled Arnusch, who farms in Keenesburg. "We wanted to provide a stocked refrigerator for the crop to pull from in the fall, winter and early spring."

Then, with the help of soil sampling, Arnusch discovered something surprising: The fridge was already full.

Most of his wheat is planted after corn silage crops, and the wheat plants were finding plenty of residual nitrogen to draw from, especially in the dry falls his region has seen in the past decade. Now, the only nutrient he applies at

planting is phosphorus.

The reality is that fall-emerging winter wheat doesn't need too much nitrogen, confirmed Dorivar Ruiz Diaz, a Kansas State agronomist who specializes in soil fertility and nutrient management.

"One thing we see pretty consistently is that nitrogen uptake in the fall and winter is no more than 30 to 35 pounds," said Ruiz Diaz. "And depending on when we plant and how much biomass we get, that could be as low as 15 to 20 pounds taken up in the fall and winter."

## The ruinous impact of chemical farming

December 06, 2021 - Updated 06:22 pm IST

The lip-service paid to organic farming must be backed by budgetary intent. Chemical farming is undeniably harmful

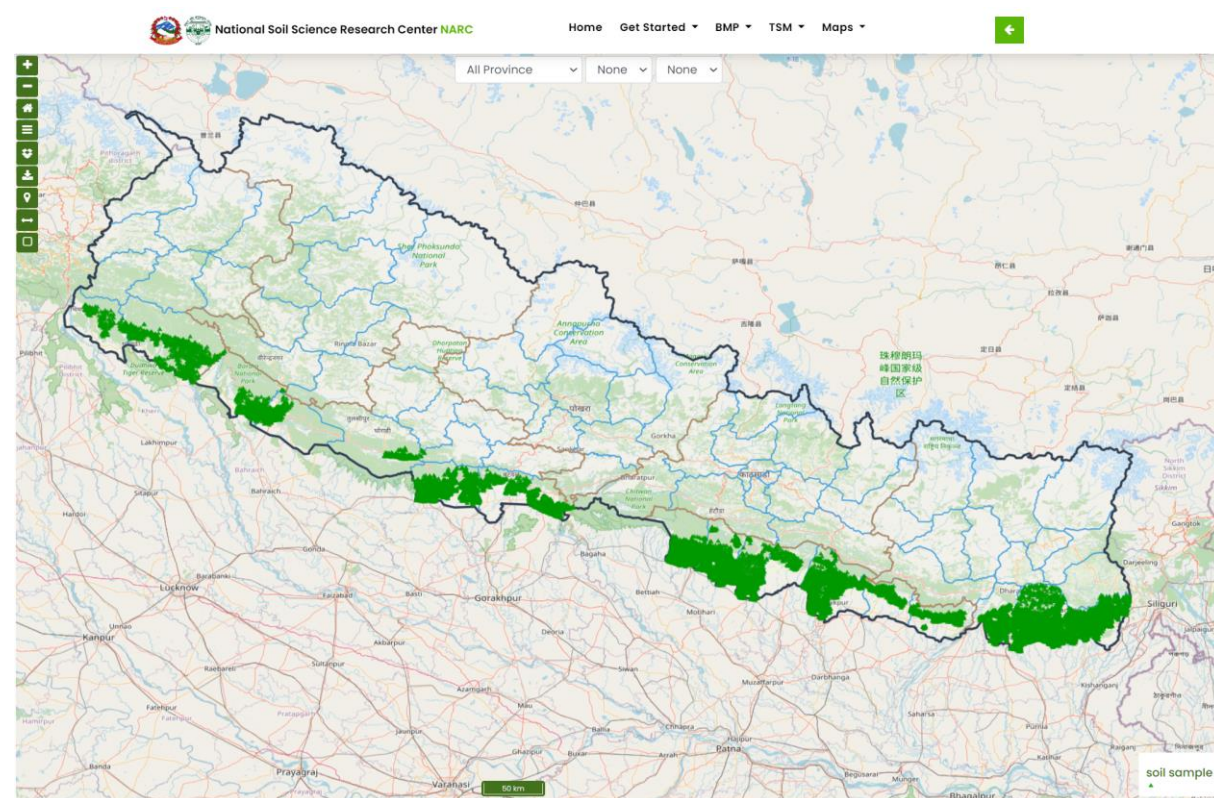
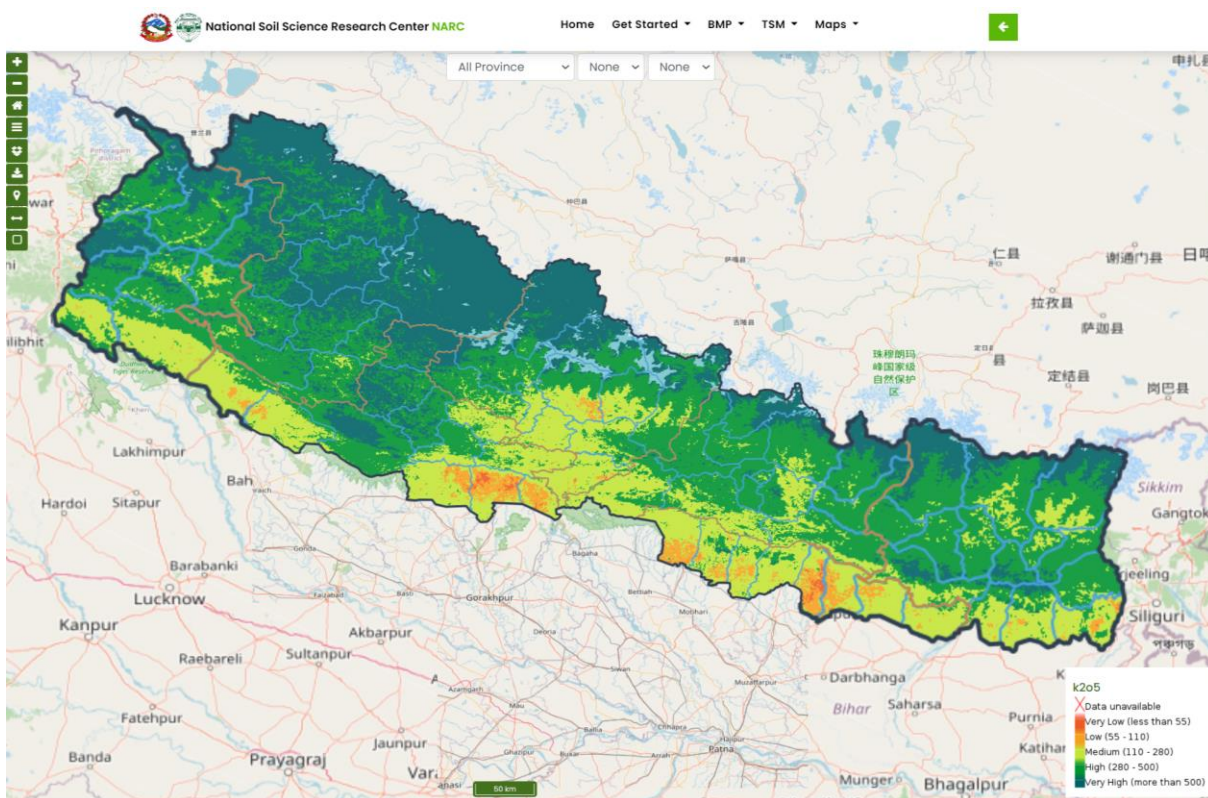
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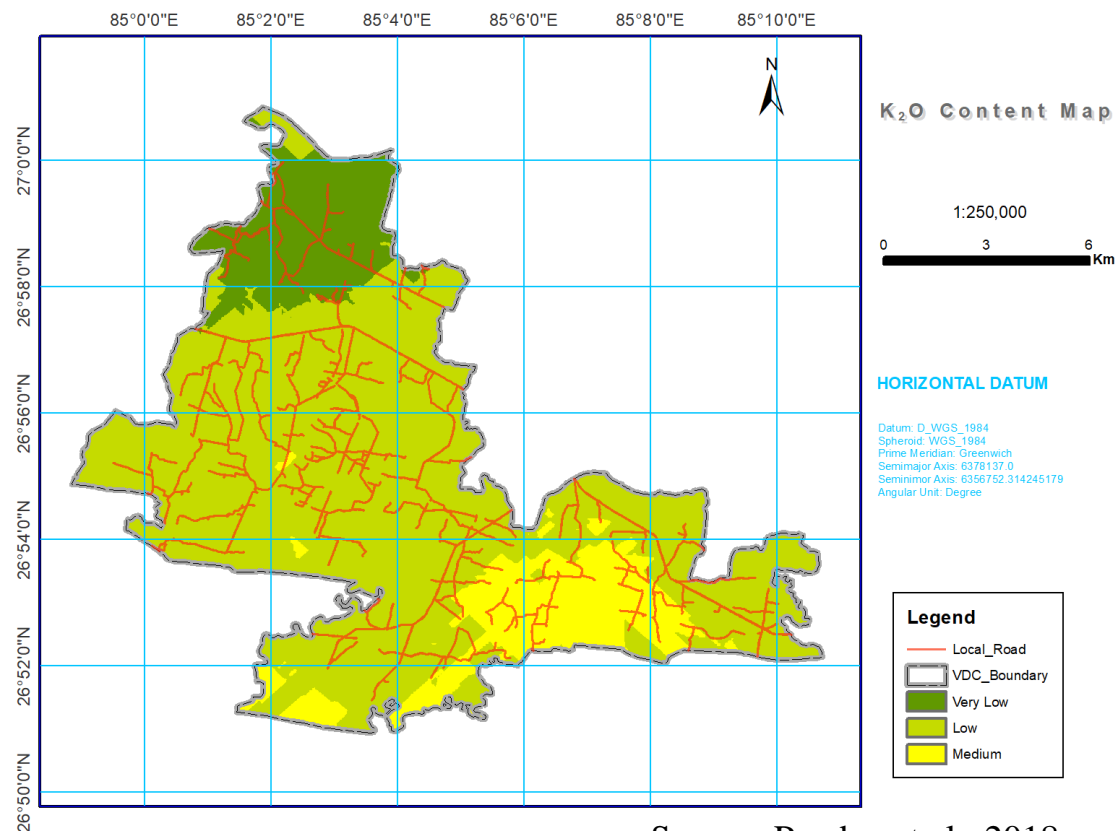


The huge fertiliser subsidy bill has hardly benefited the farmer | Photo Credit: A MURALITHARAN









Source: Panday et al., 2018

#### RESEARCH ARTICLE

## Potassium nutrient response in the rice-wheat cropping system in different agro-ecozones of Nepal

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### Abstract

Most of the soils of Nepal had a higher potassium (K, expressed as K<sub>2</sub>O) level inherently. Later in 1976, the Government of Nepal has recommended K fertilizer rate at 30 kg K<sub>2</sub>O ha<sup>-1</sup> in rice-wheat cropping systems. However, those crops began showing K deficiency symptoms in recent decades, which could be due to a large portion of soils with depleted K level or the insufficient input of K fertilizer for crop production. This study explored a limitation of K nutrient in the crops by establishing field trials from 2009–2014 at three agro-ecozones i.e., inner-Terai (2009–2010), high-Hills (2011–2012), and Terai (2012–2014) in Nepal. Seven rates of K fertilizer at 0, 15, 30, 45, 60, 75, and 90 kg K<sub>2</sub>O ha<sup>-1</sup> were replicated four times in a randomized complete block design, where crop yields and yield-attributing parameters of rice-wheat cropping system were recorded. Results revealed that an increase in K rates from 45 to 75 kg K<sub>2</sub>O ha<sup>-1</sup> under inner-Terai and Terai conditions and 45 to 60 kg ha<sup>-1</sup> under high-Hills conditions produced significantly higher grain yields compared to the recommended K dose. Economically, the optimum rate of K fertilizer should not exceed 68 kg K<sub>2</sub>O ha<sup>-1</sup> for rice in all agro-ecozones, or 73 kg K<sub>2</sub>O ha<sup>-1</sup> for wheat in inner-Terai and 60 kg K<sub>2</sub>O ha<sup>-1</sup> for wheat in high-Hills and Terai. Our findings suggest to increase potassium application in between 1.5 to 2.5 times of the current K fertilizer rate in rice-wheat cropping system of Nepal that need to be tested further in different locations and crop varieties.

Source: Ojha et al., 2021

## Improving fertilizer recommendations for Nepalese farmers with the help of soil-testing mobile van

Sunil Pandey, Netra Prasad Bhatta, Prakash Paudel, Rajan Pariyar, Kiran Hari Maskey, Janardan Khadka, Tuk Bahadur Thapa, Balaram Rijal & **Dinesh Panday** ...show less

Pages 19-32 | Received 07 Jul 2017, Accepted 30 Sep 2017, Published online: 29 Nov 2017

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<https://doi.org/10.1080/15427528.2017.1387837>

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### ABSTRACT

Smallholder farmers dominate agriculture in Nepal. These farmers have poor knowledge about agriculture and lack of support for soil management and integrated plant-nutrient systems. Focusing on the importance and need for soil-fertility management, a soil-testing mobile van program has recently been introduced in Nepal by Soil Management Directorate, Hariharbhawan. With the introduction of the mobile lab, farmers can get their soil tested for nutrient deficiencies and fertilizer requirements at their doorsteps. Using mobile lab, spatial distributions of chemical properties, including pH, organic matter (OM), total nitrogen (N), available phosphorus (as  $P_2O_5$ ), and available potassium (as  $K_2O$ ) were examined in soil samples taken from the 0 to 15 cm depth from selected agricultural fields in eight different districts in the mid-hills and Terai regions of Nepal. Tests conducted on 1,479 soil samples in the soil-testing mobile van revealed the following: the mean soil OM ranged from 0.01 to 1.77%; total N content ranged from 0.01 to 0.08%; mean available  $P_2O_5$  ranged from 16.47 to 197.82  $kg\ ha^{-1}$ ; and mean available  $K_2O$  ranged from 84.3 to 422.57  $kg\ ha^{-1}$ . For each crop to be grown, farmers were provided with individual soil health reports and fertilizer recommendations (rate, amount, and type). This program not only allows scientists and farmers to work closely and share information but also serves as a model for the nation to successfully transfer technology for improving soil health and sustainability.

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Dinesh Panday et al.  
Cogent Food & Agriculture  
Published online: 25 Apr 2019







Source: Soil Resource Development Institute, Bangladesh



*IPNI and partners helping South Asian smallholder cereal farmers reduce environmental footprint of fertilizer use Credit: International Plant Nutrition Institute*



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## Nepal Government endorses new site-specific fertilizer recommendations for rice

*CIMMYT supports the development of site-specific fertilizer recommendations to increase rice productivity in Nepal.*

By [Bandana Pradhan](#) and [Yam Gaihre](#)

August 9, 2022





Hi

Hi doctor!

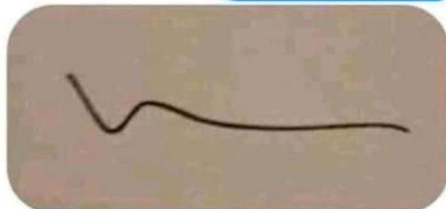
How to read this?



It's paracetamol

Sarcasm

How about this?



I wrote... amoxicillin 3x a day

VS

Fertilizer recommendation card based on soil test  
Soil Resources Development Institute  
Ministry of Agriculture

<b>Farmer,s</b>	Md. Anower Hossain	<b>Soil test number</b>	
<b>Father/Husband,s name</b>	Abul Kasem	<b>Date of sample collection</b>	
<b>Mother,s name</b>		<b>Soil depth (cm)</b>	
<b>Village</b>	Gagonpur	<b>Land type</b>	
<b>Mouja number</b>		<b>Flooding depth (cm)</b>	
<b>Post</b>		<b>Soil series</b>	
<b>Union</b>	Handial	<b>Name of crops</b>	
<b>Upazilla</b>	Chutmohor	<b>Rabi</b>	Mustard-Boro
<b>District</b>	Pubna	<b>Kharif-1</b>	Sesame
<b>Possible cropping pattern</b>		<b>Kharif-2</b>	Aman
		<b>Quantity of fertilizer (g/decimel)</b>	
<b>Analysis nutrient element</b>	<b>Fertility status</b>	<b>Name of fertiliz</b>	<b>Season</b>
<b>Name &amp;unit</b>	<b>Weight</b>	<b>Crop</b>	
N (%)	Low	Urea	Mustard Boro
P (µg/g soil)	24 Optimum	TSP	1000 1400
K (meq/100g soil)	0.13 Low	MOP	250 250
S (µg/g soil)	13.9 Low	Gypsum	620 605
Zn (µg/g soil)	Low	Znc sulphate	330 330
B (µg/g soil)	Low	Boric acid	435 340
Ph	7.4 Slightly alkaline	Lime (kg/decimel)	340 220
Salinity			30 40
Organic matter (%)		CD/Com post (kg/decimel)	15 -
		Others	20 -
			10 20
			10 10

Source: Sultana et al., 2015





**Thank you!**