

# RESEARCH WITH IMPACT

## THE CHALLENGE:

Annual and perennial grasses and legumes are important forage crops in Russia, occupying almost 20% of the total cultivated land. Insufficient fertilization and poor-quality seed has led to low productivity of forage grasses and poor silage quality. Russia currently imports a significant amount of milk products and the desire to build the domestic dairy industry has prompted the need to boost the production of high-quality forage.



## THE RESEARCH SOLUTION:

IPNI initiated a research project in Vologda (northwest Russia), the key region for milk production. The project was established on the leading regional dairy farm with a forage crop area of 2,600 ha and an average productivity of about 20 t fresh forage/ha from 1 to 2 cuttings/season.

The goal of this project was to achieve greater forage yields and quality with improved management. Our previous work has shown that properly timed applications of nitrogen (N), phosphorus (P), and potassium (K) at optimized rates can result in higher forage protein content, soluble sugars, silage quality parameters, and improved economics.

The project consists of two treatments that were compared with farm practice: (1) typical farm fertilization plus an improved blend of forage seeds and (2) optimized fertilization plus the same blend of seeds.



Optimized plot after first cut. Inset photo shows plant height (57 cm) before cutting.



Farm practice plot after first cut. Inset photo shows plant height (49 cm) before cutting.

## Improving Forage Production in Russia with Proper Fertilization

### THE RESULTS:

The optimized management treatment, including higher fertilizer application rates, and more frequent cuttings resulted in a significant increase in both productivity and quality of forages.

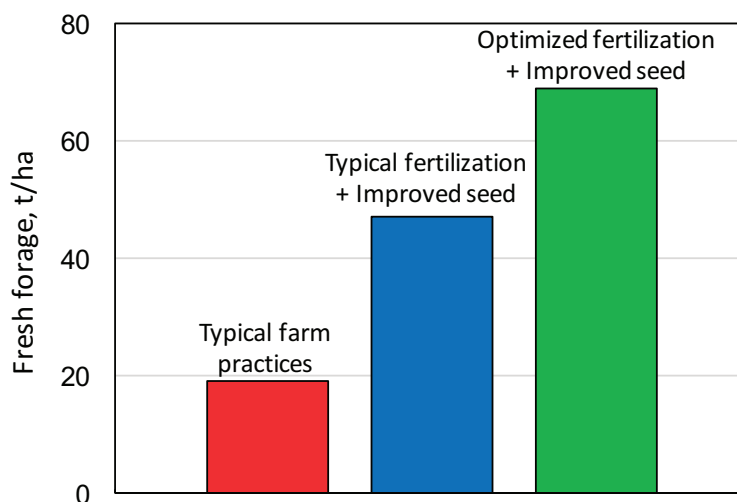
In the optimized treatment, the number of harvests was increased to four (largely due to higher N rates applied in four applications). As a result, the yield of fresh forage was more than 40% higher than farm practice with improved seed alone.

The typical production practices on the remainder of the farm resulted in only two cuts of forage, with an average fresh forage production of 19 t/ha. The optimized treatment more than tripled forage production over the farm average.

Although intensive forage management increases production costs from additional fertilizer, more frequent fertilizer applications, and more harvests, the economics of forage production was substantially improved.

The quality of forages was also improved in the optimized treatment. Forage quality is an essential component for advanced dairy nutrition and milk production. Due to the improved forage quality, average milk production for each cow increased by 2 liters of milk/day.

This project demonstrates that high-yielding forage production is possible and profitable with improved forage fertilization, crop management, and seed. High yielding, good quality forage production has the potential to stimulate Vologda's dairy industry.



The yield of dairy forage in Vologda is increased by both improved seeds and improved fertilizer practices.