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# CC273 Farm Energy Tips - Use Energy Wisely - Stretching Fertilizers

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# Farm Energy Tips



— USE ENERGY WISELY —

## Stretching Fertilizers

CC273

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(Soils)

What would you do if nitrogen fertilizer was in short supply? Suppose that your dealer could supply you with only two-thirds of the fertilizer you had originally intended to apply. How would you handle such a situation?

As an example, let's say that you have 160 acres (64.7 ha) of corn that you intended to fertilize at a rate of 160 pounds of nitrogen per acre (179 kg/ha). This would require 25,600 pounds (11,600 kg) of nitrogen from fertilizer. However, you can only get 16,000 pounds (7,260 kg) of nitrogen. Two choices are apparent. You can either apply all the nitrogen evenly over the 160 acres (64.7 ha) at a rate of 100 pounds per acre (112 kg/ha), or you could apply 160 pounds of N per acre (179 kg/ha) over 100 acres (40.5 ha), leaving 60 acres (24.3 ha) unfertilized. Which choice would you take?

To get the most from the nitrogen that you do have, you should follow the first choice. Your total yield will be larger by evenly applying your fertilizer. This is true because the greatest increase in yields comes from the first increments of applied nitrogen.

Table I may help you visualize this. Remember, the values shown are primarily for example purposes. Actual yield increases can range from zero to 120 bushels of corn per acre (10.4 m<sup>3</sup>/ha) under various field conditions. These values are used

because they represent an average yield increase per increment of applied nitrogen.

From the ninth column you can see that each additional 40 pounds of nitrogen per acre (45 kg/ha) costs you \$6 (at \$0.15/pound—\$0.33/kg). From column three, even though you add the same amount of nitrogen in each step, your yield increase gets smaller. Eventually, you will reach a point where, even though you apply more nitrogen, your yields will actually decrease.

Now, let's take a look at the two application rates (100 and 160 pounds of nitrogen per acre [112 and 179 kg/ha]) as well as the two application choices previously given.

By applying 100 pounds of nitrogen per acre (112 kg/ha) over all 160 acres, (64.7 ha) your yield increase would be about 6400 bushels (226 m<sup>3</sup>) (40 bu./ac. x 160 acres). This would give a return of \$16,000 (at \$2.50/bu. [\$70.94/m<sup>3</sup>]). By applying 160 pounds of nitrogen per acre (179 kg/ha) over 100 acres (40.5 ha), and leaving the remaining 60 acres (24.3 ha) unfertilized, you would get an increase in yield of about 49 bushels per acre (4.27 m<sup>3</sup>/ha) from the 100 acres (40.5 ha). Your total yield increase would be 4900 bushels (173 m<sup>3</sup>), valued at \$12,250. Remember, there is no increased yield from the unfertilized acres.

The second choice would give you \$3750 less in gross returns. However, you do save the cost of fertilizer application on the unfertilized 60 acres (24.3 ha) This amounts to about \$3.50 per acre (\$8.65/ha), or \$210. Your net return would therefore be \$3540 less. In other words, you would be



**Table 1. Costs and Returns for Various Nitrogen Fertilizer Applications Rates.**

Nitrogen Applied		Yield Increase		Crop Price				Nitrogen Costs			
lbs/ac	(kg/ha)	bu/ac	(m <sup>3</sup> /ha)	\$2.00/bu	(\$56.75/m <sup>3</sup> )	\$2.50/bu	(\$70.94/m <sup>3</sup> )	\$0.15/lb	(\$0.33/kg)	\$0.30/lb	(\$0.66/kg)
				Economic Returns							
				per ac.	(per ha)	per ac.	(per ha)	\$/ac	(\$/ha)	\$/ac	(\$/ha)
40	(45)	23	(2.00)	\$46.00	(\$113.50)	\$57.50	(\$142.00)	\$ 6.00	(\$14.85)	\$12.00	(\$ 29.70)
80	(90)	11	(0.96)	22.00	( 54.50)	27.50	( 68.00)	12.00	( 29.70)	24.00	( 59.40)
120	(135)	9	(0.78)	18.00	( 44.25)	22.50	( 55.50)	36.00	( 44.55)	36.00	( 89.10)
160	(179)	6	(0.52)	12.00	( 29.50)	15.00	( 37.00)	48.00	( 59.10)	48.00	( 118.15)
200	(224)	3	(0.26)	6.00	( 14.75)	7.50	( 18.50)	60.00	( 73.90)	60.00	( 147.85)

*Yield increases are based on the averages from approximately 40 research trials conducted by the Department of Agronomy - UNL.*

losing over \$22 per acre (\$54 per ha) by not evenly applying your nitrogen fertilizer.

In all cases, your fertilizer goal should be to maximize the profit from your nitrogen fertilizer, rather than trying to maximize your yields.

By following a conscientious nitrogen fertilizer

management program, you can be on your way toward getting the most from your fertilizer dollars and you will be "Using Energy Wisely."

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