Irrigation water N lookup tables

Instructions on use of these lookup tables

Once printed, these lookup tables can be used to calculate the N added to a field in irrigation water. **No computer is needed to use the lookup tables.**

For more information, or to use an online calculator to obtain a similar estimate of the amount of nitrogen (N) in a single or blended water source, please go to https://agmpep.com/calc-irrn/ . That calculator also contains a convertor from water volume or pump run time to water depth (inches). A simple version of this convertor is on the "Acre-feet_or_run_time_to_inches" tab in this workbook, but unlike these lookup tables, it must be used on a computer. Instructions for calculating N in irrigation water directly (without lookup tables or a computer) are also provided on the Calculation Guide tab/page.

Most surface irrigation water supplies will have very low N concentrations. Groundwater may have more, and some groundwater can have very high concentrations. In these cases, ignoring the N contribution of irrigation water when making N management decisions can result in over-application of N to a crop.

Nitrate is usually the main source of irrigation water N. Ammonium will not be relevant for most irrigation water, but can be important if any confined animal or other wastewater is being used. If you don't have a current lab report, you can use other resources to estimate concentrations of nitrate, and (when needed) ammonium:
>>For surface water, obtain concentrations from your irrigation water supplier if they have a recent laboratory result or an estimate of the long-term average.
>>For groundwater, results from past analyses from the same or similar wells can be averaged.

The printed **Tables 1 through 4** can be used to determine the amount of N in irrigation water that you apply, as follows:

If you know your applied water in inches, proceed directly to Table 3 to lookup the amount of nitrate-N (lb/a) it contains. For a detailed explanation of how to use this lookup table, see "**Using Tables 3 and 4**", below.

If you don't know your applied water in terms of acre-feet or inches applied, but do know run time and flow rate, lookup the volume in **Table 1**. Then you can use the acre-feet result to lookup inches of applied water in **Table 2**.

If you don't know your applied water in terms of inches applied but do know it in acre-feet, use it with your field acreage to lookup inches of applied water in **Table 2**.

If you also have some ammonium in your irrigation water (as many wastewaters, for example, do), then lookup the amount of ammonium-N (lb/a) in **Table 4**.

Nitrate and ammonium are dealt with on **Tables 3 and 4**, so you should choose one or the other, depending on the form of N you are evaluating. If you are working with both nitrate and ammonium forms of N, then you will need to use each table separately, and add the results together to get the total inorganic N in your water.

Using Tables 3 and 4
Identify the form of nitrogen on your lab report or other reference, and look up the result (in mg/L = ppm) vertically downward in the column matching the analysis in your report (choosing from among the "***N concentration (mg/L or ppm)***" columns, containing values for Nitrate-N or Nitrate (both on **Table 3**), and Ammonium-N or Ammonium (both on **Table 4**), as applicable. Most irrigation water lab reports will show only nitrate (**Table 3**). Select the horizontal row where the value most closely matches the result on your report. *As with any lookup table, if the exact value for your field is not displayed, select and look up the results for values slightly above and below your field's value, then interpolate to select an intermediate result that applies to your field.* **This interpolation approach is also applicable to Tables 1 and 2.**

Select the column showing the depth of irrigation water from this source that is taken up by your crop during the year, from the row of numbers immediately beneath the green bar labeled "***Depth of Water during Season (inches).***"

At the beige cell where the selected row and column intersect you will find a calculated estimate of N available to the crop from the irrigation source, in pounds of N per acre-year.

If irrigating with more than one irrigation water source (for example, surface & groundwater sources being used in the same field during the same year), repeat the process for each source of water, and add the results together to get the total inorganic N from the multiple water sources. Again, surface irrigation supplies often contain little N, but this should be confirmed.

To account for irrigation water N when fertilizing, subtract the result proportionally from applications made during periods when the source of irrigation water is being used. For example, if a groundwater supply that has higher nitrate concentration is used early in the

Guide for calculating and adjusting fertilizer rates for nitrogen (N) in irrigation water

Information required:

Depth of irrigation water applied (in inches). Go to step 4 if you need to convert to inches from acre-feet, GPM, or CFS.
Concentration of inorganic (nitrate and/or ammonium N) in irrigation water, from lab report, irrigation district, etc.
Nitrogen required by crop, so that fertilizer needs can be adjusted to reflect N contributed by irrigaiton water.

Calculate as follows:

Perform steps 1 and 2, once for each form of inorganic N, in each source of irrigation water.
For example:
If you are evaluating a groundwater source with a lab report for nitrate-N, use N factor (d) from step 1 in the calculation shown in step 2.
If you are additionally evaluating a wastewater source with a lab report for ammonium, use N factor (d) from step 1 in the calculation shown in step 2, and adjust your crop's fertilizer needs (step 3).

1. Select N factor based on the form of nitrogen you are evaluating, from the following 4 options.

For concentration in ppm or mg/L of inorganic N form:	Multiply by the concentration by the corresponding N factor:
a) NO3-N (Nitrate-N)	2.72
b) NO3 (Nitrate)	0.615
c) NH4-N (Ammonium-N)	2.72
d) NH4 (Ammonium)	2.11

2. Calculate N in irrigation water (lb/a) from nitrate or ammonium concentration.
a. If you know applied water in inches, proceed directly to step 2b. If working with acre-feet, or a flow rate and run/application duration, skip to step 4 to calculate applied water in inches, then return to step 2b.
b. Calculate N in irrigation water for use in step 3 as follows:

Depth of applied water *(inches) /* ***12*** *x* ***Concentration*** *(ppm or mg/L) x* ***N factor*** *=* ***N applied in irrigation water*** *(lb/acre)*

3. Subtract the N in irrigation water (lb/a) from the N required by the crop to get the amount of N needed from fertilizer.
If you are considering more than one source of irrigation water, or multiple forms of nitrogen, then:
If the sources are applied at different times (for example, preplant and mid-season), you can consider them as separate applications and adjust fertilizer applications for each period accordingly.
Otherwise, add results for each form of N in each source of water together to get the total inorganic N applied in irrigation water (lb/a). Deduct this amount the crop's N requirement and supply the rest with fertilizer.

Steps 4 and 5 are only needed if applied water in inches is not known.

4. In case you need to convert irrigation water depth to inches (which are needed in step 2) from acre-feet, GPM, or CFS, calculate as follows:
a. If you know applied water in acre-feet, proceed directly to step 4b. If working with a flow rate and run/application duration, skip to step 5 to calculate applied water in acre-feet.
b. Calculate applied water in inches as follows:

Applied water (acre-feet) / **field size** (acres) * 12 = **Depth of applied water** (inches)

5. Calculate applied water in acre-feet from flow rate and run time as follows:

a. Select V factor based on the units of flow rate that you are evaluating, from the following 2 options:

To convert flow rate in these units to acre-feet:	Multiply the flow rate and run time by the corresponding V factor:
GPM	0.00018
CFS	0.0826

b. Calculate applied water in acre-feet as follows, for use in step 4b:

Flow rate (CFS or GPM) x **run time** (hours) x V Factor = Applied water (acre-feet)

Numbers in beige field are in acre-feet of applied water

Table 1. Skip to Table 3 if you know applied water in acre-feet or inches. Otherwise, use this table to look up applied water in acre-feet based on a) application flow rate (in gallons per minute [gpm] or cubic feet per second [cfs]), and b) pump run time (or application duration, in hours). Use Table 2 to convert the result (in acre-feet) to inches of applied water on your field.

Run time or application duration (hours)	Application flow rate																															
	(in gpm)	50	60	70	80	90	100	120	140	160	180	200	240	280	320	360	400	480	560	640	720	800	960	1120	1280	1440	1600	1920	2240	2560	2880	3200
	(in cfs)	0.11	0.13	0.16	0.18	0.20	0.22	0.27	0.31	0.36	0.40	0.45	0.53	0.62	0.71	0.80	0.89	1.07	1.25	1.43	1.60	1.78	2.14	2.50	2.85	3.21	3.56	4.28	4.99	5.70	6.42	7.13
0.5		0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.09	0.10	0.12	0.13	0.15	0.2	0.2	0.2	0.3	0.3
1		0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.09	0.10	0.12	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6
2		0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.07	0.09	0.10	0.12	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2
3		0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.13	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8
4		0.04	0.04	0.05	0.06	0.07	0.07	0.09	0.10	0.12	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.9	2.1	2.4
5		0.05	0.06	0.06	0.07	0.08	0.09	0.11	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.2	1.3	1.5	1.8	2.1	2.4	2.7	2.9
6		0.06	0.07	0.08	0.09	0.10	0.11	0.13	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.1	2.5	2.8	3.2	3.5
7		0.06	0.08	0.09	0.10	0.12	0.13	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.9	2.1	2.5	2.9	3.3	3.7	4.1
8		0.07	0.09	0.10	0.12	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.9	2.1	2.4	2.8	3.3	3.8	4.2	4.7
9		0.08	0.10	0.12	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.3	1.6	1.9	2.1	2.4	2.7	3.2	3.7	4.2	4.8	5.3
10		0.09	0.11	0.13	0.15	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.2	1.3	1.5	1.8	2.1	2.4	2.7	2.9	3.5	4.1	4.7	5.3	5.9
11		0.10	0.12	0.14	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.5	1.6	1.9	2.3	2.6	2.9	3.2	3.9	4.5	5.2	5.8	6.5
12		0.11	0.13	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.1	2.5	2.8	3.2	3.5	4.2	4.9	5.7	6.4	7.1
13		0.12	0.14	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.7	1.9	2.3	2.7	3.1	3.4	3.8	4.6	5.4	6.1	6.9	7.7
14		0.13	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.9	2.1	2.5	2.9	3.3	3.7	4.1	4.9	5.8	6.6	7.4	8.2
15		0.14	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.8	2.0	2.2	2.7	3.1	3.5	4.0	4.4	5.3	6.2	7.1	8.0	8.8
16		0.15	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.9	2.1	2.4	2.8	3.3	3.8	4.2	4.7	5.7	6.6	7.5	8.5	9.4
17		0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.8	0.9	1.0	1.1	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0
18		0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.3	1.6	1.9	2.1	2.4	2.7	3.2	3.7	4.2	4.8	5.3	6.4	7.4	8.5	9.5	10.6
19		0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.7	2.0	2.2	2.5	2.8	3.4	3.9	4.5	5.0	5.6	6.7	7.8	9.0	10.1	11.2
20		0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.2	1.3	1.5	1.8	2.1	2.4	2.7	2.9	3.5	4.1	4.7	5.3	5.9	7.1	8.2	9.4	10.6	11.8
22		0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.5	1.6	1.9	2.3	2.6	2.9	3.2	3.9	4.5	5.2	5.8	6.5	7.8	9.1	10.4	11.7	13.0
24		0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.1	2.5	2.8	3.2	3.5	4.2	4.9	5.7	6.4	7.1	8.5	9.9	11.3	12.7	14.1
26		0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.7	1.9	2.3	2.7	3.1	3.4	3.8	4.6	5.4	6.1	6.9	7.7	9.2	10.7	12.3	13.8	15.3
28		0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.9	2.1	2.5	2.9	3.3	3.7	4.1	4.9	5.8	6.6	7.4	8.2	9.9	11.5	13.2	14.8	16.5
30		0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.8	2.0	2.2	2.7	3.1	3.5	4.0	4.4	5.3	6.2	7.1	8.0	8.8	10.6	12.4	14.1	15.9	17.7
32		0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.9	2.1	2.4	2.8	3.3	3.8	4.2	4.7	5.7	6.6	7.5	8.5	9.4	11.3	13.2	15.1	17.0	18.9
34		0.3	0.4	0.4	0.5	0.6	0.6	0.8	0.9	1.0	1.1	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0	12.0	14.0	16.0	18.0	20.0
36		0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.3	1.6	1.9	2.1	2.4	2.7	3.2	3.7	4.2	4.8	5.3	6.4	7.4	8.5	9.5	10.6	12.7	14.8	17.0	19.1	21.2
38		0.3	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.7	2.0	2.2	2.5	2.8	3.4	3.9	4.5	5.0	5.6	6.7	7.8	9.0	10.1	11.2	13.4	15.7	17.9	20.2	22.4
40		0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.2	1.3	1.5	1.8	2.1	2.4	2.7	2.9	3.5	4.1	4.7	5.3	5.9	7.1	8.2	9.4	10.6	11.8	14.1	16.5	18.9	21.2	23.6
42		0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.5	1.9	2.2	2.5	2.8	3.1	3.7	4.3	4.9	5.6	6.2	7.4	8.7	9.9	11.1	12.4	14.8	17.3	19.8	22.3	24.7
44		0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.5	1.6	1.9	2.3	2.6	2.9	3.2	3.9	4.5	5.2	5.8	6.5	7.8	9.1	10.4	11.7	13.0	15.6	18.1	20.7	23.3	25.9
46		0.4	0.5	0.6	0.7	0.8	0.8	1.0	1.2	1.4	1.5	1.7	2.0	2.4	2.7	3.0	3.4	4.1	4.7	5.4	6.1	6.8	8.1	9.5	10.8	12.2	13.6	16.3	19.0	21.7	24.4	27.1
48		0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.1	2.5	2.8	3.2	3.5	4.2	4.9	5.7	6.4	7.1	8.5	9.9	11.3	12.7	14.1	17.0	19.8	22.6	25.5	28.3
50		0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.7	1.8	2.2	2.6	2.9	3.3	3.7	4.4	5.2	5.9	6.6	7.4	8.8	10.3	11.8	13.3	14.7	17.7	20.6	23.6	26.5	29.5

Numbers in *italics* are in inches of water on the field

Table 2. Skip to Table 3 if you know applied water in inches. Otherwise, use this table to look up applied water in inches based on a) volume of water applied (in acre-feet), and b) field size (in acres)

Applied water (acre-feet)	Field size (acres)																														
	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	240	280	320	360	400	480	560	640	720	800	880
0.5	*1.2*	*0.6*	*0.4*	*0.3*	*0.24*	*0.20*	*0.17*	*0.15*	*0.13*	*0.12*	*0.10*	*0.09*	*0.08*	*0.07*	*0.06*	*0.05*	*0.04*	*0.04*	*0.03*	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
1	*2.4*	*1.2*	*0.8*	*0.6*	*0.48*	*0.40*	*0.34*	*0.30*	*0.27*	*0.24*	*0.20*	*0.17*	*0.15*	*0.13*	*0.12*	*0.10*	*0.09*	*0.08*	*0.07*	*0.06*	*0.05*	*0.04*	*0.04*	*0.03*	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
2	*4.8*	*2.4*	*1.6*	*1.2*	*1.0*	*0.8*	*0.7*	*0.6*	*0.53*	*0.48*	*0.40*	*0.34*	*0.30*	*0.27*	*0.24*	*0.20*	*0.17*	*0.15*	*0.13*	*0.12*	*0.10*	*0.09*	*0.08*	*0.07*	*0.06*	*0.05*	*0.04*	*0.04*	*0.03*	*0.03*	*0.03*
3	*7.2*	*3.6*	*2.4*	*1.8*	*1.4*	*1.2*	*1.0*	*0.90*	*0.80*	*0.72*	*0.60*	*0.51*	*0.45*	*0.40*	*0.36*	*0.30*	*0.26*	*0.23*	*0.20*	*0.18*	*0.15*	*0.13*	*0.11*	*0.10*	*0.09*	*0.08*	*0.06*	*0.06*	*0.05*	*0.05*	*0.04*
4	*9.6*	*4.8*	*3.2*	*2.4*	*1.9*	*1.6*	*1.4*	*1.2*	*1.1*	*1.0*	*0.80*	*0.69*	*0.60*	*0.53*	*0.48*	*0.40*	*0.34*	*0.30*	*0.27*	*0.24*	*0.20*	*0.17*	*0.15*	*0.13*	*0.12*	*0.10*	*0.09*	*0.08*	*0.07*	*0.06*	*0.05*
5	*12*	*6*	*4*	*3*	*2.4*	*2*	*1.7*	*1.5*	*1.3*	*1.2*	*1.00*	*0.86*	*0.75*	*0.67*	*0.60*	*0.50*	*0.43*	*0.38*	*0.33*	*0.30*	*0.25*	*0.21*	*0.19*	*0.17*	*0.15*	*0.13*	*0.11*	*0.09*	*0.08*	*0.08*	*0.07*
10	*24*	*12*	*8*	*6*	*4.8*	*4*	*3.4*	*3.0*	*2.7*	*2.4*	*2.0*	*1.7*	*1.5*	*1.3*	*1.2*	*1.0*	*0.86*	*0.75*	*0.67*	*0.60*	*0.50*	*0.43*	*0.38*	*0.33*	*0.30*	*0.25*	*0.21*	*0.19*	*0.17*	*0.15*	*0.14*
15	*36*	*18*	*12*	*9*	*7.2*	*6*	*5.1*	*4.5*	*4.0*	*3.6*	*3.0*	*2.6*	*2.3*	*2.0*	*1.8*	*1.5*	*1.3*	*1.1*	*1.0*	*0.90*	*0.75*	*0.64*	*0.56*	*0.50*	*0.45*	*0.38*	*0.32*	*0.28*	*0.25*	*0.23*	*0.20*
20	*48*	*24*	*16*	*12*	*9.6*	*8*	*6.9*	*6.0*	*5.3*	*4.8*	*4.0*	*3.4*	*3.0*	*2.7*	*2.4*	*2.0*	*1.7*	*1.5*	*1.3*	*1.2*	*1.0*	*0.86*	*0.75*	*0.67*	*0.60*	*0.50*	*0.43*	*0.38*	*0.33*	*0.30*	*0.27*
25	*60*	*30*	*20*	*15*	*12*	*10*	*8.6*	*7.5*	*6.7*	*6.0*	*5.0*	*4.3*	*3.8*	*3.3*	*3.0*	*2.5*	*2.1*	*1.9*	*1.7*	*1.5*	*1.3*	*1.1*	*0.94*	*0.83*	*0.75*	*0.63*	*0.54*	*0.47*	*0.42*	*0.38*	*0.34*
30	*72*	*36*	*24*	*18*	*14*	*12*	*10*	*9.0*	*8.0*	*7.2*	*6.0*	*5.1*	*4.5*	*4.0*	*3.6*	*3.0*	*2.6*	*2.3*	*2.0*	*1.8*	*1.5*	*1.3*	*1.13*	*1.00*	*0.90*	*0.75*	*0.64*	*0.56*	*0.50*	*0.45*	*0.41*
35	*84*	*42*	*28*	*21*	*17*	*14*	*12*	*11*	*9.3*	*8.4*	*7.0*	*6.0*	*5.3*	*4.7*	*4.2*	*3.5*	*3.0*	*2.6*	*2.3*	*2.1*	*1.8*	*1.5*	*1.3*	*1.2*	*1.1*	*0.88*	*0.75*	*0.66*	*0.58*	*0.53*	*0.48*
40	*96*	*48*	*32*	*24*	*19*	*16*	*14*	*12*	*11*	*9.6*	*8.0*	*6.9*	*6.0*	*5.3*	*4.8*	*4.0*	*3.4*	*3.0*	*2.7*	*2.4*	*2.0*	*1.7*	*1.5*	*1.3*	*1.2*	*1.00*	*0.86*	*0.75*	*0.67*	*0.60*	*0.55*
45	*108*	*54*	*36*	*27*	*22*	*18*	*15*	*14*	*12*	*11*	*9.0*	*7.7*	*6.8*	*6.0*	*5.4*	*4.5*	*3.9*	*3.4*	*3.0*	*2.7*	*2.3*	*1.9*	*1.7*	*1.5*	*1.4*	*1.13*	*0.96*	*0.84*	*0.75*	*0.68*	*0.61*
50	*120*	*60*	*40*	*30*	*24*	*20*	*17*	*15*	*13*	*12*	*10*	*8.6*	*7.5*	*6.7*	*6.0*	*5.0*	*4.3*	*3.8*	*3.3*	*3.0*	*2.5*	*2.1*	*1.9*	*1.7*	*1.5*	*1.25*	*1.07*	*0.94*	*0.83*	*0.75*	*0.68*
60	*144*	*72*	*48*	*36*	*29*	*24*	*21*	*18*	*16*	*14*	*12*	*10*	*9.0*	*8.0*	*7.2*	*6.0*	*5.1*	*4.5*	*4.0*	*3.6*	*3.0*	*2.6*	*2.3*	*2.0*	*1.8*	*1.5*	*1.3*	*1.1*	*1.00*	*0.90*	*0.82*
70	*168*	*84*	*56*	*42*	*34*	*28*	*24*	*21*	*19*	*17*	*14*	*12*	*11*	*9.3*	*8.4*	*7.0*	*6.0*	*5.3*	*4.7*	*4.2*	*3.5*	*3.0*	*2.6*	*2.3*	*2.1*	*1.8*	*1.5*	*1.3*	*1.2*	*1.1*	*0.95*
80	*192*	*96*	*64*	*48*	*38*	*32*	*27*	*24*	*21*	*19*	*16*	*14*	*12*	*11*	*9.6*	*8.0*	*6.9*	*6.0*	*5.3*	*4.8*	*4.0*	*3.4*	*3.0*	*2.7*	*2.4*	*2.0*	*1.7*	*1.5*	*1.3*	*1.2*	*1.1*
90	*216*	*108*	*72*	*54*	*43*	*36*	*31*	*27*	*24*	*22*	*18*	*15*	*14*	*12*	*11*	*9.0*	*7.7*	*6.8*	*6.0*	*5.4*	*4.5*	*3.9*	*3.4*	*3.0*	*2.7*	*2.3*	*1.9*	*1.7*	*1.5*	*1.4*	*1.2*
100	*240*	*120*	*80*	*60*	*48*	*40*	*34*	*30*	*27*	*24*	*20*	*17*	*15*	*13*	*12*	*10*	*8.6*	*7.5*	*6.7*	*6.0*	*5.0*	*4.3*	*3.8*	*3.3*	*3.0*	*2.5*	*2.1*	*1.9*	*1.7*	*1.5*	*1.4*
120	*288*	*144*	*96*	*72*	*58*	*48*	*41*	*36*	*32*	*29*	*24*	*21*	*18*	*16*	*14*	*12*	*10*	*9.0*	*8.0*	*7.2*	*6.0*	*5.1*	*4.5*	*4.0*	*3.6*	*3.0*	*2.6*	*2.3*	*2.0*	*1.8*	*1.6*
140	*336*	*168*	*112*	*84*	*67*	*56*	*48*	*42*	*37*	*34*	*28*	*24*	*21*	*19*	*17*	*14*	*12*	*11*	*9.3*	*8.4*	*7.0*	*6.0*	*5.3*	*4.7*	*4.2*	*3.5*	*3.0*	*2.6*	*2.3*	*2.1*	*1.9*
160	*384*	*192*	*128*	*96*	*77*	*64*	*55*	*48*	*43*	*38*	*32*	*27*	*24*	*21*	*19*	*16*	*14*	*12*	*11*	*9.6*	*8.0*	*6.9*	*6.0*	*5.3*	*4.8*	*4.0*	*3.4*	*3.0*	*2.7*	*2.4*	*2.2*
180	*432*	*216*	*144*	*108*	*86*	*72*	*62*	*54*	*48*	*43*	*36*	*31*	*27*	*24*	*22*	*18*	*15*	*14*	*12*	*11*	*9.0*	*7.7*	*6.8*	*6.0*	*5.4*	*4.5*	*3.9*	*3.4*	*3.0*	*2.7*	*2.5*
200	*480*	*240*	*160*	*120*	*96*	*80*	*69*	*60*	*53*	*48*	*40*	*34*	*30*	*27*	*24*	*20*	*17*	*15*	*13*	*12*	*10*	*8.6*	*7.5*	*6.7*	*6.0*	*5.0*	*4.3*	*3.8*	*3.3*	*3.0*	*2.7*
240	*576*	*288*	*192*	*144*	*115*	*96*	*82*	*72*	*64*	*58*	*48*	*41*	*36*	*32*	*29*	*24*	*21*	*18*	*16*	*14*	*12*	*10*	*9.0*	*8.0*	*7.2*	*6.0*	*5.1*	*4.5*	*4.0*	*3.6*	*3.3*
280	*672*	*336*	*224*	*168*	*134*	*112*	*96*	*84*	*75*	*67*	*56*	*48*	*42*	*37*	*34*	*28*	*24*	*21*	*19*	*17*	*14*	*12*	*11*	*9.3*	*8.4*	*7.0*	*6.0*	*5.3*	*4.7*	*4.2*	*3.8*
320	*768*	*384*	*256*	*192*	*154*	*128*	*110*	*96*	*85*	*77*	*64*	*55*	*48*	*43*	*38*	*32*	*27*	*24*	*21*	*19*	*16*	*14*	*12*	*11*	*9.6*	*8.0*	*6.9*	*6.0*	*5.3*	*4.8*	*4.4*
360	*864*	*432*	*288*	*216*	*173*	*144*	*123*	*108*	*96*	*86*	*72*	*62*	*54*	*48*	*43*	*36*	*31*	*27*	*24*	*22*	*18*	*15*	*14*	*12*	*11*	*9.0*	*7.7*	*6.8*	*6.0*	*5.4*	*4.9*
400	*960*	*480*	*320*	*240*	*192*	*160*	*137*	*120*	*107*	*96*	*80*	*69*	*60*	*53*	*48*	*40*	*34*	*30*	*27*	*24*	*20*	*17*	*15*	*13*	*12*	*10*	*8.6*	*7.5*	*6.7*	*6.0*	*5.5*
440	*1,056*	*528*	*352*	*264*	*211*	*176*	*151*	*132*	*117*	*106*	*88*	*75*	*66*	*59*	*53*	*44*	*38*	*33*	*29*	*26*	*22*	*19*	*17*	*15*	*13*	*11*	*9.4*	*8.3*	*7.3*	*6.6*	*6.0*
520	*1,248*	*624*	*416*	*312*	*250*	*208*	*178*	*156*	*139*	*125*	*104*	*89*	*78*	*69*	*62*	*52*	*45*	*39*	*35*	*31*	*26*	*22*	*20*	*17*	*16*	*13*	*11*	*9.8*	*8.7*	*7.8*	*7.1*
600	*1,440*	*720*	*480*	*360*	*288*	*240*	*206*	*180*	*160*	*144*	*120*	*103*	*90*	*80*	*72*	*60*	*51*	*45*	*40*	*36*	*30*	*26*	*23*	*20*	*18*	*15*	*13*	*11*	*10*	*9.0*	*8.2*
680	*1,632*	*816*	*544*	*408*	*326*	*272*	*233*	*204*	*181*	*163*	*136*	*117*	*102*	*91*	*82*	*68*	*58*	*51*	*45*	*41*	*34*	*29*	*26*	*23*	*20*	*17*	*15*	*13*	*11*	*10*	*9.3*
760	*1,824*	*912*	*608*	*456*	*365*	*304*	*261*	*228*	*203*	*182*	*152*	*130*	*114*	*101*	*91*	*76*	*65*	*57*	*51*	*46*	*38*	*33*	*29*	*25*	*23*	*19*	*16*	*14*	*13*	*11*	*10*
840	*2,016*	*1,008*	*672*	*504*	*403*	*336*	*288*	*252*	*224*	*202*	*168*	*144*	*126*	*112*	*101*	*84*	*72*	*63*	*56*	*50*	*42*	*36*	*32*	*28*	*25*	*21*	*18*	*16*	*14*	*13*	*11*
920	*2,208*	*1,104*	*736*	*552*	*442*	*368*	*315*	*276*	*245*	*221*	*184*	*158*	*138*	*123*	*110*	*92*	*79*	*69*	*61*	*55*	*46*	*39*	*35*	*31*	*28*	*23*	*20*	*17*	*15*	*14*	*13*
1000	*2,400*	*1,200*	*800*	*600*	*480*	*400*	*343*	*300*	*267*	*240*	*200*	*171*	*150*	*133*	*120*	*100*	*86*	*75*	*67*	*60*	*50*	*43*	*38*	*33*	*30*	*25*	*21*	*19*	*17*	*15*	*14*

Numbers in beige fields are in pounds of N per acre-year

Table 3. Use this table to look up N in lb/a based on a) depth of water applied, and b) nitrate concentration in applied water.

N concentration (mg/L or ppm)		*Depth of Water during Season (inches)*																									
as NO3-N (Nitrate-N)	as NO3 (Nitrate)	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.5	2.2	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	5	6	6	6	6	7	7
1	4.4	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	10	11	11	12	12	13	13	14
2	8.9	5	5	6	7	8	9	10	11	12	13	14	15	15	16	17	18	19	20	21	22	23	24	24	25	26	27
4	18	9	11	13	15	16	18	20	22	24	25	27	29	31	33	34	36	38	40	42	44	45	47	49	51	53	54
6	27	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52	54	57	60	63	65	68	71	73	76	79	82
8	35	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	83	87	91	94	98	102	105	109
10	44	23	27	32	36	41	45	50	54	59	63	68	73	77	82	86	91	95	100	104	109	113	118	122	127	131	136
12	53	27	33	38	44	49	54	60	65	71	76	82	87	92	98	103	109	114	120	125	131	136	141	147	152	158	163
14	62	32	38	44	51	57	63	70	76	83	89	95	102	108	114	121	127	133	140	146	152	159	165	171	178	184	190
16	71	36	44	51	58	65	73	80	87	94	102	109	116	123	131	138	145	152	160	167	174	181	189	196	203	210	218
18	80	41	49	57	65	73	82	90	98	106	114	122	131	139	147	155	163	171	180	188	196	204	212	220	228	237	245
20	89	45	54	63	73	82	91	100	109	118	127	136	145	154	163	172	181	190	199	209	218	227	236	245	254	263	272
25	111	57	68	79	91	102	113	125	136	147	159	170	181	193	204	215	227	238	249	261	272	283	295	306	317	329	340
30	133	68	82	95	109	122	136	150	163	177	190	204	218	231	245	258	272	286	299	313	326	340	354	367	381	394	408
35	155	79	95	111	127	143	159	175	190	206	222	238	254	270	286	301	317	333	349	365	381	397	413	428	444	460	476
40	177	91	109	127	145	163	181	199	218	236	254	272	290	308	326	345	363	381	399	417	435	453	471	490	508	526	544
45	199	102	122	143	163	184	204	224	245	265	286	306	326	347	367	388	408	428	449	469	490	510	530	551	571	592	612
50	221	113	136	159	181	204	227	249	272	295	317	340	363	385	408	431	453	476	499	521	544	567	589	612	635	657	680
55	243	125	150	175	199	224	249	274	299	324	349	374	399	424	449	474	499	524	549	573	598	623	648	673	698	723	748
60	266	136	163	190	218	245	272	299	326	354	381	408	435	462	490	517	544	571	598	626	653	680	707	734	762	789	816
65	288	147	177	206	236	265	295	324	354	383	413	442	471	501	530	560	589	619	648	678	707	737	766	796	825	855	884
70	310	159	190	222	254	286	317	349	381	413	444	476	508	539	571	603	635	666	698	730	762	793	825	857	889	920	952
75	332	170	204	238	272	306	340	374	408	442	476	510	544	578	612	646	680	714	748	782	816	850	884	918	952	986	1,020
80	354	181	218	254	290	326	363	399	435	471	508	544	580	617	653	689	725	762	798	834	870	907	943	979	1,015	1,052	1,088
85	376	193	231	270	308	347	385	424	462	501	539	578	617	655	694	732	771	809	848	886	925	963	1,002	1,040	1,079	1,117	1,156
90	398	204	245	286	326	367	408	449	490	530	571	612	653	694	734	775	816	857	898	938	979	1,020	1,061	1,102	1,142	1,183	1,224
95	420	215	258	301	345	388	431	474	517	560	603	646	689	732	775	818	861	904	947	991	1,034	1,077	1,120	1,163	1,206	1,249	1,292
100	443	227	272	317	363	408	453	499	544	589	635	680	725	771	816	861	907	952	997	1,043	1,088	1,133	1,179	1,224	1,269	1,315	1,360
105	465	238	286	333	381	428	476	524	571	619	666	714	762	809	857	904	952	1,000	1,047	1,095	1,142	1,190	1,238	1,285	1,333	1,380	1,428
110	487	249	299	349	399	449	499	549	598	648	698	748	798	848	898	947	997	1,047	1,097	1,147	1,197	1,247	1,297	1,346	1,396	1,446	1,496
115	509	261	313	365	417	469	521	573	626	678	730	782	834	886	938	991	1,043	1,095	1,147	1,199	1,251	1,303	1,355	1,408	1,460	1,512	1,564
120	531	272	326	381	435	490	544	598	653	707	762	816	870	925	979	1,034	1,088	1,142	1,197	1,251	1,306	1,360	1,414	1,469	1,523	1,578	1,632

Numbers in beige fields are in pounds of N per acre-year

Table 4. If your water contains some ammonium nitrogen, then use this table to look up N in lb/a based on a) depth of water applied, and b) ammonium concentration in applied water.

N concentration (mg/L or ppm)		*Depth of Water during Season (inches)*																									
as NH4-N (Ammonium-N)	as NH4 (Ammonium)	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.5	0.6	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	5	6	6	6	6	7	7
1	1.3	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	10	11	11	12	12	13	13	14
2	2.6	5	5	6	7	8	9	10	11	12	13	14	15	15	16	17	18	19	20	21	22	23	24	24	25	26	27
4	5	9	11	13	15	16	18	20	22	24	25	27	29	31	33	34	36	38	40	42	44	45	47	49	51	53	54
6	8	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52	54	57	60	63	65	68	71	73	76	79	82
8	10	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73	76	80	83	87	91	94	98	102	105	109
10	13	23	27	32	36	41	45	50	54	59	63	68	73	77	82	86	91	95	100	104	109	113	118	122	127	131	136
12	15	27	33	38	44	49	54	60	65	71	76	82	87	92	98	103	109	114	120	125	131	136	141	147	152	158	163
14	18	32	38	44	51	57	63	70	76	83	89	95	102	108	114	121	127	133	140	146	152	159	165	171	178	184	190
16	21	36	44	51	58	65	73	80	87	94	102	109	116	123	131	138	145	152	160	167	174	181	189	196	203	210	218
18	23	41	49	57	65	73	82	90	98	106	114	122	131	139	147	155	163	171	180	188	196	204	212	220	228	237	245
20	26	45	54	63	73	82	91	100	109	118	127	136	145	154	163	172	181	190	199	209	218	227	236	245	254	263	272
25	32	57	68	79	91	102	113	125	136	147	159	170	181	193	204	215	227	238	249	261	272	283	295	306	317	329	340
30	39	68	82	95	109	122	136	150	163	177	190	204	218	231	245	258	272	286	299	313	326	340	354	367	381	394	408
35	45	79	95	111	127	143	159	175	190	206	222	238	254	270	286	301	317	333	349	365	381	397	413	428	444	460	476
40	52	91	109	127	145	163	181	199	218	236	254	272	290	308	326	345	363	381	399	417	435	453	471	490	508	526	544
45	58	102	122	143	163	184	204	224	245	265	286	306	326	347	367	388	408	428	449	469	490	510	530	551	571	592	612
50	64	113	136	159	181	204	227	249	272	295	317	340	363	385	408	431	453	476	499	521	544	567	589	612	635	657	680
55	71	125	150	175	199	224	249	274	299	324	349	374	399	424	449	474	499	524	549	573	598	623	648	673	698	723	748
60	77	136	163	190	218	245	272	299	326	354	381	408	435	462	490	517	544	571	598	626	653	680	707	734	762	789	816
65	84	147	177	206	236	265	295	324	354	383	413	442	471	501	530	560	589	619	648	678	707	737	766	796	825	855	884
70	90	159	190	222	254	286	317	349	381	413	444	476	508	539	571	603	635	666	698	730	762	793	825	857	889	920	952
75	97	170	204	238	272	306	340	374	408	442	476	510	544	578	612	646	680	714	748	782	816	850	884	918	952	986	1,020
80	103	181	218	254	290	326	363	399	435	471	508	544	580	617	653	689	725	762	798	834	870	907	943	979	1,015	1,052	1,088
85	109	193	231	270	308	347	385	424	462	501	539	578	617	655	694	732	771	809	848	886	925	963	1,002	1,040	1,079	1,117	1,156
90	116	204	245	286	326	367	408	449	490	530	571	612	653	694	734	775	816	857	898	938	979	1,020	1,061	1,102	1,142	1,183	1,224
95	122	215	258	301	345	388	431	474	517	560	603	646	689	732	775	818	861	904	947	991	1,034	1,077	1,120	1,163	1,206	1,249	1,292
100	129	227	272	317	363	408	453	499	544	589	635	680	725	771	816	861	907	952	997	1,043	1,088	1,133	1,179	1,224	1,269	1,315	1,360
105	135	238	286	333	381	428	476	524	571	619	666	714	762	809	857	904	952	1,000	1,047	1,095	1,142	1,190	1,238	1,285	1,333	1,380	1,428
110	142	249	299	349	399	449	499	549	598	648	698	748	798	848	898	947	997	1,047	1,097	1,147	1,197	1,247	1,297	1,346	1,396	1,446	1,496
115	148	261	313	365	417	469	521	573	626	678	730	782	834	886	938	991	1,043	1,095	1,147	1,199	1,251	1,303	1,355	1,408	1,460	1,512	1,564
120	155	272	326	381	435	490	544	598	653	707	762	816	870	925	979	1,034	1,088	1,142	1,197	1,251	1,306	1,360	1,414	1,469	1,523	1,578	1,632