

## Problem Set: Lagoon Water Analysis

1. The lab report states that a sample of lagoon water has an ammonium-nitrogen content of 271 ppm. How many lbs of nitrogen from ammonium will be in 3 acre-inches of lagoon water?

$$\begin{aligned} 271 \times .225 &= 61 \text{ lbs per acre-in} \\ 61 \times 3 &= \boxed{183 \text{ lbs per 3 acre-in}} \end{aligned}$$

2. For the same sample, how many lbs of ammonium nitrogen are in 450,000 gallons?

$$\begin{aligned} 271 \times .008 &= 2.168 \text{ lbs/1000 gallons} \\ 2.168 \times 450 &= \boxed{975.6 \text{ lbs N from ammonium}} \end{aligned}$$

3. Potassium (K) is reported as .03%. How many lbs of K are in 3 acre-inches? How many lbs of K<sub>2</sub>O?

$$\begin{aligned} .03 \times 2254 &= 67.6 \text{ lbs K per acre-in} \\ 67.6 \times 3 &= 202.9 \text{ lbs K in 3 acre-inches} \\ 202.9 \times 1.2 &= 243.5 \text{ lbs K}_2\text{O in 3 acre-inches} \end{aligned}$$

4. How many pounds of sodium (Na) will be applied in a 3 acre-inch undiluted irrigation if the lab report indicates the Na content of the lagoon water is 3 meq/L?

$$\begin{aligned} 3 \text{ meq Na} \times 23 &= 69 \text{ ppm Na} \\ 69 \text{ ppm} \times .225 &= 2.02 \text{ lbs Na per acre-in} \\ 2.02 \times 3 &= \boxed{6.06 \text{ lbs Na in 3 acre-inches}} \end{aligned}$$

5. A lab report has ammonium nitrogen at 112 ppm. The total N is reported as .1%. How much organic nitrogen is in acre-in of lagoon water?

$$\begin{aligned} 112 \times .225 &= 25.2 \text{ lbs ammonium nitrogen per acre-in.} \\ .1 \times 2254 &= 225.4 \text{ lbs total N} \end{aligned}$$

Total N – ammonium N = organic N + nitrate N but very little or no nitrate N in lagoon water.  $\boxed{\text{Therefore } 225.4 - 25.2 = 200.2 \text{ lbs organic N in an acre-in.}}$