
Calculating volume of pond

• Quarter-acre pond
• 148.5 ft x 73.4 ft = 10,900 sq.ft X Average depth is 5 ft = 54,500 cubic feet
• Convert to cubic meters
  54,500 ft^3 x 1 m^3 / 35.31 ft^3 = 1,543.5 m^3

Inorganic Fertilizer Calculations

Nitrogen Concentration needed

• Target is 600 mg / L (micrograms per Liter)

Formula used: \[
\frac{(600 - Np) \times Vp}{Vnf} = \frac{Nf \times 1,000}{Nf \times 1,000}
\]

Where: Vnf = volume of N fertilizer needed (L)
Np= inorganic nitrogen concentration in pond
Vp = volume of pond
Nf = Nitrogen fertilizer concentration
1,000 = conversion factor L and m3 and mg and g

\[
\frac{(600 - 0) \times 1543.5 \text{ m}^3}{396 \times 1,000} = 2.34 \text{ L Fertilizer needed}
\]

• Assumes there is 0 Concentration in pond
• Most ponds this is the case after one week, though exceptions occur

Phosphorus Concentration needed

• Target is 30 mg / L

Formula used: \[
\frac{(30-Pp) \times Vp}{Vpf} = \frac{Pf \times 1000}{Pf \times 1000}
\]

Where:
Vpf = volume of phosphorus needed in pond
Pp = Phosphorus concentration in pond
Vp = pond volume
Pf = Phosphorus concentration in fertilizer
1,000 = conversion factor
\[
(30 - 0) \times 1543.5 \text{ m}^3 \\
V_{pf} = \frac{237.25 \times 1,000}{2} = 195 \text{ mL}
\]

Again, assumes zero concentration of phosphorus in pond

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**Organic Fertilizer calculation**

- **P – 30 mg/ L Concentration**  
  \[30 \text{ mg/ L} \times 1.54 \text{ million L (pond)} = 46 \text{ g needed}
  \]
  Roughly, 0.1 lb needed

- **N – 600 mg/ L Concentration**  
  \[600 \text{ mg/ L} \times 1.54 \text{ million L (pond)} = 926 \text{ g needed}
  \]
  Roughly, 2 lbs needed
  
  50 lb bag has 1 lb of Nitrogen, 0.1 lb P

- We doubled the amount of alfalfa meal to 100 lbs per week, to give us 600 mg/ L N concentration, but also gave us a 60 mg/ L concentration for P.
  
  – 10:1 Ratio, remember ideal is 20:1