

Mathematics in Agriculture

Presented by Galynn Beer
Sales and Budget Manager for
Agro-Culture Liquid Fertilizers



Let's get to the **DIRTY** side of
Math.

- Soil Analysis

- For peak performance, soils

M.E.Q. x C.E.C. x %B.S.=lbs needed to correct
quantities

M.E.Q. is based on Atomic Mass from Periodic Table

C.E.C. is the soil's nutrient-holding capacity

%B.S. is the percentage of exchange sites occupied by a nutrient
Calculation of existing amounts

- Calculation of amounts to be added



Areas where **MATH** skills are vital.

- Soil Analysis
- Calculation of various fertilizer contents
- For foreign markets, conversions to/from metric
- Areas of various shapes
- Market Protection Strategies
- Evaluation of Retailer Performance
- Application Rates
- Finance Decisions
- Piloting of airplane for more efficient travel



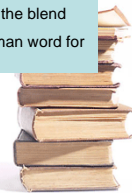
Breaking down fertilizer blends with **MATH.**

Calculations and
Analysis of fertilizer blends is listed as N-P-K
practices

First number (which is Nitrogen) is the % of N in the blend

Second number (which is Phosphorus) is the % of P in the blend

Third Number (which is Potassium) is the % of K in the blend
(the chemical symbol for K is derived from the German word for Potassium which is Kalium)



Making foreign Markets familiar with **Math.**

Liters x 3.785=Gallons

Hectares x 2.47=Acre

Kilograms x 2.2=Lbs.

- Kilograms/pounds



Reducing Risk with **Math.**

- Hedging for:

To cover risk using commodities trading:

Tons of raw material purchased/1000=contracts to be sold to cover position

Avg. gallons of diesel used per load x loads to be delivered/1000=contracts needed to be purchased to cover cost



Shaping up acres with **Math.**

- Fields come in multiple

1) Length (in ft) x Height (in ft)/43560 (sq. ft. in 1 acre)=acres

2) $\pi \times r^2/43560$ =acres in a circle

3) $\frac{1}{2} \times \text{Base (of triangle)} \times \text{height (of triangle)}/43560$ =acres

- Rectangles
- Squares
- Circles of various sizes
- Triangles



Retailer comparisons with **Math.**

- Investment in:

$((\text{Advertising} + \text{Soil Sampling} + \text{Training} + \text{Customer Education})/\text{gross revenues}) \times 100$ =% of sales expense

- Training
- Customer Education

- Revenues Generated
- Investment as % of Sales



Applying with **Math.**

- Proper application rates

$(GPA \times \text{speed} \times \text{width}) / 5940 = \text{gallons/min. of flow rate needed for water}$

Fertilizers vary in weight/gallon, so divide weight/gallon of fertilizer by 8.35 (weight of a gallon of water) to get specific gravity of fertilizer.

Take specific gravity x GPM for water to get flow rate needed for fertilizer

Determine preferred pressure then consult chart to determine nozzle size needed



Flying High with **Math.**

F Example Formulas:

A VFR conditions..... $((\text{Total gallons of Fuel} - (.5 \times$

V fuel burn/hour)/fuel burn/hour=available duration

P IFR conditions..... $((\text{Total gallons of Fuel} - (\text{time}$

H to fly to alternate x fuel burn/hr) - (.75 x fuel

D burn/hr)/fuel burn/hr= available duration

R Both VFR & IFR...available duration/calculated

ground speed=distance to be flown before refuel

- weight and balance

- Take-off performance



Investments Evaluated with **Math.**

Factors:

Tax Depreciation or Investment Tax Credit

Lease or Buy

Future Value of Money



Prepare for **SUCCESS** with **MATH.**

- Math is an important part of any successful person's career.

Thanks for your attention!

Teach with Passion!

