10-5-17

To: Paula Blaydes
From: Robert Kourik, Consultant/Author
Re: Rainwater Catchment Calculations for Glentucky Family Farm

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The formula for calculating the rainwater harvest yield as per the American Rainwater Catchment Systems Association (ARCSA) website link below is:

http://www.arcsa.org/?page=268

Each square foot of collection surface area is multiplied by .62 to get the number of gallons per inch of rain and they multiplied by a .85 efficiency coefficient for losses in capture (e.g. dirty roof, shingle absorption, etc.).

Estimated Rainwater Harvest Yield for Glentucky Family Farm:

5,360 square foot roof (combined garage/house)
x .62 gallons
3,323 gallons for each inch of rain
x 33 (the average rainfall in inches for Glen Ellen)
109,666 gallons per year
x .85 (an efficiency coefficient for losses from lost water,
93,216 gallons of average annual water catchment

Total existing rainwater storage capacity at Glentucky Family Farm

- 4-5,000gal interconnected, metered tanks (not connected to the wells)
- 1-550gal storage tank
- 20,550gal. total storage capacity

Water Usage

Indoor Cultivation: 3 cultivation cycles of 10 weeks each, watering ~.5 gal per plant every 3 days x 30 plants = 360gal. per cycle. Using 3 cycles per year equals estimated **1,080gal.yr.**

Outdoor Cultivation: The plants are watered by a drip irrigation system with soil moisture measurement probes averaging every 2.5 days x with ~2.5 gal per plant x 50 plants. There are typically 137 days from planting to harvest divided by 2.5 days of watering, totals 55 water days. During very hot days watering is increased up to 10 extra applications (not waiting 2.5 days between watering). Estimated total is **8,125 gal.** per growing season.

Combined estimated total annual water use: **9,205 gallons per year**.

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