

## Water Needs Calculator for Farm Ponds

The purpose of this packet is to assist landowners in developing an estimated “gross water need” for a proposed farm pond, which will serve as a water source for crop irrigation, livestock watering or both.



**Disclaimer:**

This procedure does not guarantee suitability of the site to hold water. More detailed site investigations are required to determine site limitations. Although these sheets have been reviewed by NRCS, NO warranty, expressed or implied, is made as to the accuracy and functioning of the sheets and related materials, nor shall the fact of distribution constitute any such warranty, and NO responsibility is assumed by NRCS in connection therewith. This warranty applies to all sheets within the packet. It is not the responsibility of the agency to inform users of updates.

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If filling data in by hand, answer all appropriate items in the "fillable" Data Input and Water Needs Calculator forms.

Complete the **Data Input Form** by using Reference 1, Reference 2 and Reference 4 to enter the appropriate information. Reference 1 will be used to locate your Climate Zone. Reference 2 provides crop information, based on your Climate Zone. Reference 4 deals with Livestock information.

**Item # Instructions for completing Water Needs Calculator**

1 - 5	Complete all entries for identification purposes
6	<b>Enter</b> one of the following: Irrigation only, Irrigation & Livestock, or Livestock only.
7	<b>Verify</b> the Total Grazing Area available for all animals.
A	<b>Locate</b> pond site on Climatic Zone Map ( <a href="#">Reference 1</a> ) & enter the appropriate Climate Zone number.
B	<b>Use</b> <a href="#">Reference 2</a> for your Climate Zone and crop(s). Of your planned crops, <b>enter</b> up to 3 with the largest seasonal Net Irrigation Requirements by entering them on the appropriate line.
C - F	<b>Use</b> <a href="#">Reference 2</a> for your Climate Zone and crop(s). Enter appropriate Irrigation Requirements [Net], Weeks requiring irrigation, Plant date, and Maturity date
G	<b>Enter</b> type of planned irrigation system (Center Pivot, Traveler, Solid-Set Sprinklers, Drip Trickle).
H	<b>Use</b> <a href="#">Reference 3</a> to enter the appropriate Irrigation System Efficiencies.
J	<b>Verify</b> the planned irrigated acres for each crop.
K	<u>Formula:</u> (Item C ÷ Item H) ÷ 12) x (Item J) This value will represent the Gross Water Needs for the largest crop irrigation during the growing season.
L - N	<b>Enter</b> data to describe livestock system Use <a href="#">Reference 4</a> to enter appropriate water requirements for each specific animal type
O	<u>Formula:</u> (Item M) x (Item N) x 365 ÷ 325,829 This value will represent the Gross Water Needs to meet all herd water demands for 365 days.

**TOTAL GROSS WATER NEEDS PER YEAR** [green box] represents the total amount of water needed to meet your demands for the proposed agricultural activities. Write down the largest value from row K. ADD all of the values in row P together. Add these two values together then add 0.50 to complete the calculation. Enter final value in the "green" box at bottom of page.

To include a minimum volume of useable water for livestock, 0.50 ac-ft will be added to this final formula. [0.50 ac-ft is a product of (0.25 ac x 2 ft deep)]

\*\* Irrigation Requirements [NET] can be found in SC Irrigation Guide, (Chapter 4, page 4-8 thru 4-19) for your specific Climate Zone and crop.  
1) Recharge into pond from all sources is not considered in this basic calculator.  
2) Seepage losses out of pond are not considered in this basic calculator.

## WATER NEEDS CALCULATOR (Input Data Form)

Date:

County:

Site location description:

Crop Input Section: **See REFERENCE 2**


Acres:


Livestock Type: **See REFERENCE 4**


Herd size


Total Grazing Acres Available:

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**The "multiple crop" pairs shown at the bottom of REFERENCE 2 represent single year sequences with the growing season of one crop overlapping a second crop. This does NOT represent a multi-year cropping rotation. To use these pairs, you MUST plant the exact combinations, as shown, due to NET Irrigation requirements used in the calculator.**

Use the Reference material to complete this Data Form.  
This data will be transferred to the Water Needs Calculator on page 3.

Additional data will be required on the WATER NEEDS CALCULATOR to complete the process.

### WATER NEEDS CALCULATOR FOR FARM PONDS

1 County: \_\_\_\_\_

2 Owner: \_\_\_\_\_

3 Address: \_\_\_\_\_

4 City / Zip Code: \_\_\_\_\_

5 Date Completed: \_\_\_\_\_

6 Intended Pond Use: \_\_\_\_\_ ← See Instruction Sheet, item 6

7 Total Grazing Area: \_\_\_\_\_ acres (for all animals)

#### Irrigated Acres Known - Pond Surface Area Unknown

Item	Design Data	Ref No.	CROP #1	CROP #2	CROP #3
A	Climate Zone:	Ref 1			
B	Planned Crop:	Ref 2			
C	Irrigation Requirements [NET] (in)**:	Ref 2			
D	Weeks requiring irrigation (weeks):	Ref 2			
E	Planned Crop Plant Date:	Ref 2			
F	Planned Crop Harvest Date:	Ref 2			
G	Planned Irrigation Equipment:	Ref 3			
H	Irrigation Equipment Efficiency (0.xx):	Ref 3			
J	Acres planned to be irrigated (acres):				
K	<b>Water needs (ac-ft):</b> <b>(Item J) x (Item C ÷ Item H) ÷ 12)</b>				

#### Livestock Information Known - Pond Surface Area Unknown

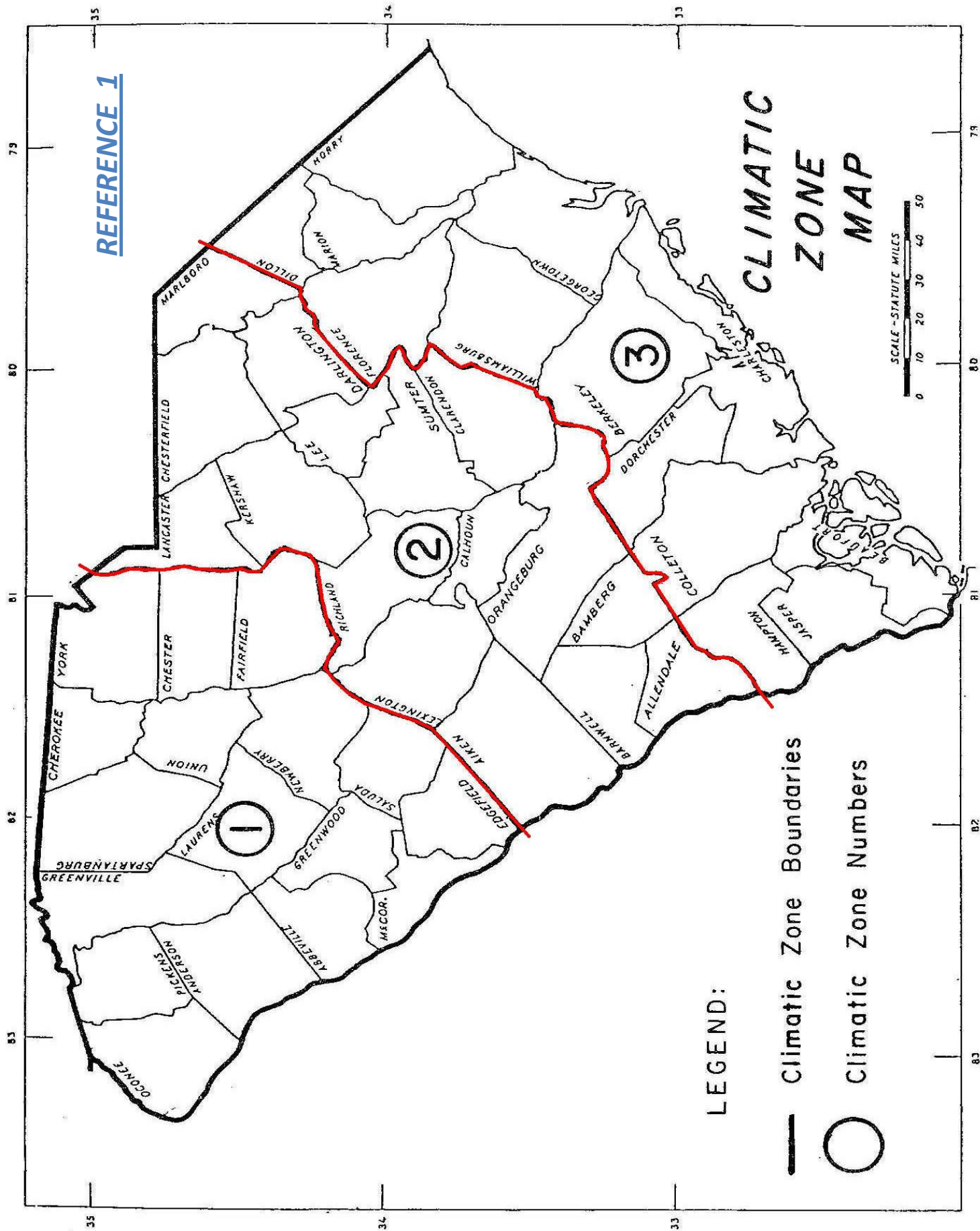
Item	Design Data	Ref No.	Animal #1	Animal #2	Animal #3
L	Animal Type:	Ref 4			
M	Water Requirements (gal/day):	Ref 4			
N	Maximum Herd Size per animal:				
O	<b>Water needs (ac/ft):</b> <b>(Item M) x (Item N) x 365 ÷ 325,829</b>				

\*\* Irrigation Requirements [NET] come from the SC Irrigation Guide, (Chapter 4, page 4-8 thru 4-19) for your specific Climate Zone and crop.

1) Recharge into pond is not considered in this basic calculator.

2) Seepage losses out of pond are not considered in this basic calculator.

<b>TOTAL GROSS WATER NEEDS PER YEAR =</b>		<b>ac-ft</b>
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Reference 2. Crop Information (CLIMATE ZONE 1)

Crop	Date		Season Totals- Net Irrigation Req't (in)	Weeks requiring irrigation
	Plant	Maturity		
Apples	20-Mar	15-Sep	13.57	28
Corn, Grain	1-Apr	20-Jul	11.31	12
Corn, Silage	1-Apr	20-Jul	11.35	12
Corn, Sweet	1-Apr	30-Jun	8.78	12
Cotton	20-Apr	20-Sep	12.49	16
Deciduous Orchard *_ /	20-Mar	15-Aug	10.67	20
Grain Alfalfa	15-Mar	15-Sep	20.07	28
Grapes	1-Apr	15-Sep	9.61	20
Pasture Grasses	15-Mar	15-Sep	18.32	24
Peanuts	1-May	18-Sep	10.68	16
Pecan & Walnuts	1-Apr	10-Oct	14.65	24
Small Vegetables, early Spring	20-Feb	21-Apr	1.83	8
Small Vegetables, late Spring	20-Mar	19-May	3.04	8
Small Vegetables, early Summer	20-Apr	19-Jun	4.07	8
Small Vegetables, Summer	20-Apr	19-Jul	6.83	12
Small Vegetables, late Summer	1-Aug	15-Oct	4.73	12
Sorghum	1-Jun	30-Sep	11.95	16
Soybean, Early	10-May	30-Sep	13.02	16
Soybean, Late	10-Jun	28-Oct	11.77	16
Strawberries	20-Mar	19-May	3.04	8
Tomatoes	1-May	29-Aug	11.07	16
Winter Wheat	1-Nov	31-May	7.48	24
Corn/ Peanuts/ Cotton	1-Apr	20-Sep	34.5	20
Corn/ Sorghum/ Soybeans, Early	1-Apr	30-Sep	36.3	20
Corn/ Sorghum/ Peanuts	1-Apr	30-Sep	34	20
Wheat/ Alfalfa/ Soybean, Late/ Corn Silage	1-Nov	28-Oct	49.6	44

\*\_ / Deciduous Orchards without cover

**Reference 2. Crop Information (CLIMATE ZONE 2)**

Crop	Date		Season Totals- Net Irrigation Req't (in)	Weeks requiring irrigation
	Plant	Maturity		
Corn, Grain	20-Mar	8-Jul	10.88	16
Corn, Silage	20-Mar	8-Jul	10.87	16
Corn, Sweet	20-Mar	18-Jun	8.52	12
Cotton	20-Apr	20-Sep	11.95	20
Deciduous Orchard *_ /	10-Mar	5-Aug	10.57	24
Grain Alfalfa	1-Mar	31-Aug	19.92	20
Grapes	15-Mar	31-Aug	9.37	20
Pasture Grasses	15-Mar	15-Sep	18.29	24
Peanuts	20-Apr	7-Sep	9.86	20
Pecan & Walnuts	20-Mar	30-Sep	14.54	20
Small Vegetables, early Spring	20-Feb	21-Apr	2.21	8
Small Vegetables, late Spring	20-Mar	19-May	3.52	8
Small Vegetables, early Summer	20-Apr	19-Jun	4.17	8
Small Vegetables, Summer	20-Apr	19-Jul	6.71	12
Small Vegetables, Late Summer	1-Aug	15-Oct	4.73	12
Sorghum	15-May	15-Sep	11.9	16
Soybean, Early	1-May	20-Sep	12.53	16
Soybean, Late	10-Jun	28-Oct	11.77	16
Strawberries	10-Mar	10-May	3.11	8
Tomatoes	20-Apr	18-Aug	10.38	16
Watermelons	25-Mar	12-Jul	7.75	16
Winter Wheat	1-Nov	31-May	11.23	28
Corn/ Peanuts/ Cotton	20-Mar	20-Sep	31.8	24
Corn/ Sorghum/ Soybeans, Early	20-Mar	20-Sep	35.3	24
Corn/ Sorghum/ Peanuts	20-Mar	15-Sep	32.7	24
Wheat/ Alfalfa/ Soybean, Late/ Corn Silage	1-Nov	28-Oct	53.8	44

\*\_ / Deciduous Orchards without cover



Reference 2. Crop Information (**CLIMATE ZONE 3**)

Crop	Date		Season Totals- Net Irrigation Req't (in)	Weeks requiring irrigation
	Plant	Maturity		
Corn, Grain	10-Mar	29-Jun	10.49	12
Corn, Silage	10-Mar	29-Jun	10.48	12
Corn, Sweet	10-Mar	8-Jun	8.13	12
Cotton	20-Apr	20-Sep	11.06	20
Deciduous Orchard *_ /	1-Mar	30-Jun	8.17	12
Pasture Grasses	15-Mar	15-Sep	17.51	24
Peanuts	20-Apr	7-Sep	9.37	20
Pecan & Walnuts	10-Mar	30-Sep	14.26	24
Small Vegetables, early Fall	1-Sep	15-Nov	3.82	12
Small Vegetables, early Spring	15-Feb	16-May	4.74	16
Small Vegetables, Spring	1-Mar	30-May	5.45	12
Small Vegetables, early Summer	1-Mar	29-Jun	7.99	16
Small Vegetables, late Summer	1-Aug	15-Oct	4.23	12
Sorghum	15-May	15-Sep	11.03	16
Soybean, Early	1-May	20-Sep	11.66	16
Soybean, Late	10-Jun	28-Oct	11.05	16
Strawberries	1-Mar	30-Apr	2.82	8
Tomatoes	1-Mar	29-Jun	9.08	12
Tomatoes	20-Apr	18-Aug	9.72	16
Watermelons	25-Mar	12-Jul	7.53	16
Winter Wheat	1-Nov	31-May	11.83	28
Corn/ Peanuts/ Cotton	10-Mar	20-Sep	31.0	24
Corn/ Sorghum/ Soybeans, Early	10-Mar	20-Sep	33.8	24
Corn/ Sorghum/ Peanuts	10-Mar	15-Sep	31.5	24
Wheat/ Corn, Grain	1-Nov	29-Jun	22.3	32

\*\_ / Deciduous Orchards without cover

### Reference 3. Irrigation System Efficiencies

Center Pivot	0.80
Drip Trickle	0.95
Solid-Set Sprinkler	0.65
Traveler	0.65

### Reference 4. Animal Water Requirements

Animal                      Water Requirements  
(gal / day)

Beef Cattle	20
Beef Cow/calf pair	28
Calves	7
Dry Cow	20
Goats	7
Horses	25
Milking Cow	23
Milking Cow/calf pair	35
Sheep	7