

# Blueberry Drip Irrigation

Blueberry School

Ryan Neal

Benton County Arkansas

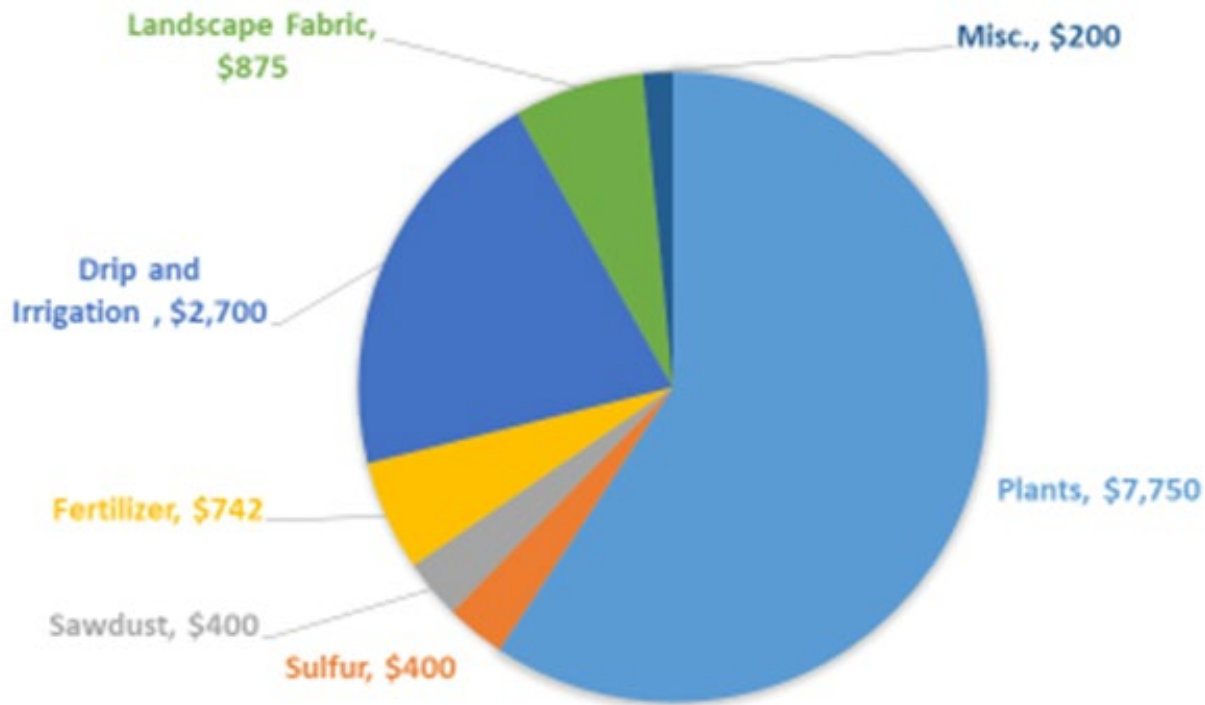
Pressure Compensating Dripline ½" diameter  
18" spacing. 1000'=\$135  
2 lines per bed  
.5 gallon per hour per emitter





# Establishment Cost

## \$13,000 per Acre



# Blueberry Water Needs

- Blueberry plants need about 1 to 2 inches rainfall per week
  - This amount is especially critical during fruit formation and harvest.
  - 1 acre inch= 27,156 gallons
- Salinity tolerances
  - Water test at your local laboratory
  - Above 1.5 dS/m yield decline may occur
- How long to run your irrigation system?
  - Drip tape flow rate, row spacing
    - Example:
      - .5gph emitters every 18" with 10' between rows=1,550gph=17.5 hours to water 1" per week
  - Consider pulsing for short amounts of time more frequent rather than for long interval less often

# Example Drip Irrigation System

## Example Fertilizer Injector: Venturi Type

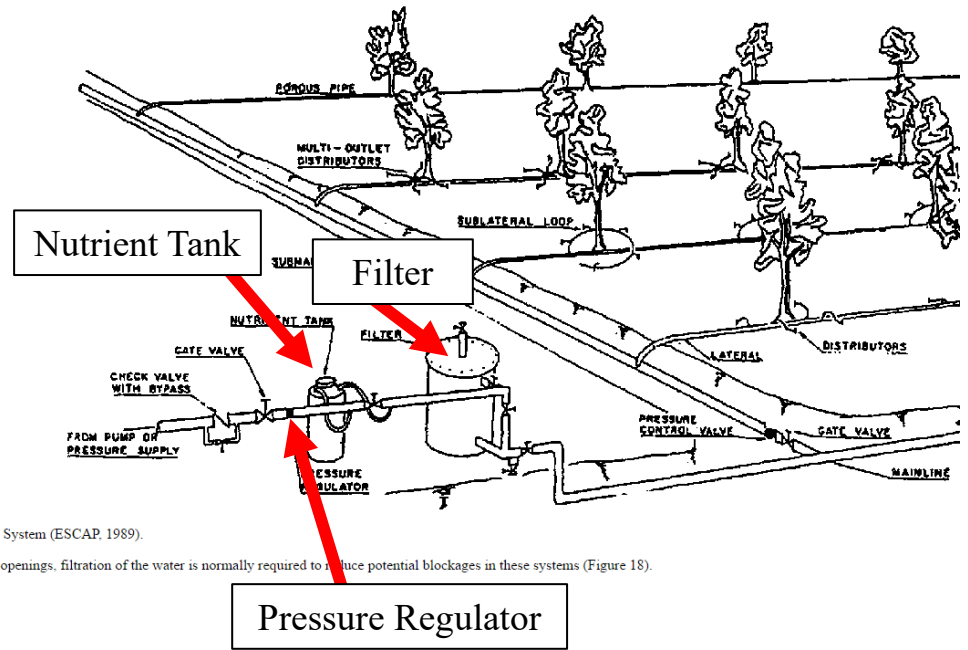
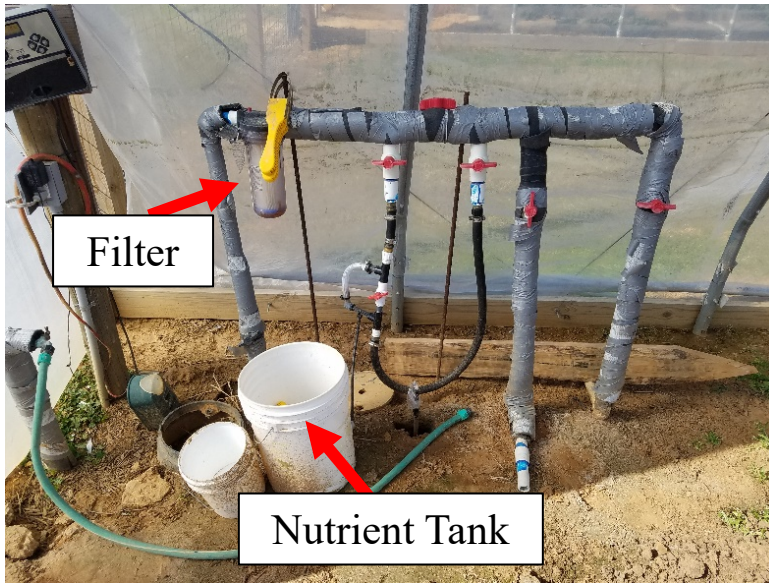


Figure 18. Drip or Microspray Irrigation System (ESCAP, 1989).

Due to the small diameter of the emitter openings, filtration of the water is normally required to reduce potential blockages in these systems (Figure 18).

# Fertigation





# Petiole Sample

Agricultural Diagnostic Laboratory  
 1366 W Altheimer Dr, Fayetteville, AR 72704-6804  
 (479)575-3908 agrilab@uark.edu  
 University of Arkansas  
**DIAGNOSTIC PLANT ANALYSIS REPORT**

NAME: Ryan Neal  
 ADDRESS: 528 W Cypress St. Rogers, AR 72756  
 E-MAIL: rjn001@gmail.com  
 PHONE: 479-659-1750  
 COUNTY: Benton  
 RECEIVED IN LAB: 7-5-19  
 REPORT E-MAILED: 7-8-19

	'13	'14	'15	'16	'17	'18	'19	
N	1.35	1.8	1.47	1.7	1.88	1.95	1.71	1.7-2.1
P	0.08	0.09	0.07	0.07	0.09	0.09	0.08	.1-4
K	0.43	0.46	0.47	0.43	0.53	0.49	0.42	.4-.65
Ca	0.56	0.61	0.6	0.55	0.58	0.46	0.47	.3-.8
Mg	0.16	0.14	0.12	0.13	0.15	0.15	0.15	.15-.3
S	0.11	0.12	0.1	0.11	0.13	0.12	0.12	.12-.2
B	40.7	28.1	37	29.1	24.5	17	18.1	30-70
Mn	406.9	484	384	377	418	291	196	50-350
Fe	14.5	51	33.9	21.7	39.9	43	31.3	60-200
Cu	2	3	1.7	3.4	4.2	4.2	2.6	5-20
Zn	10	8.6	8.5	9.1	9.7	10	8.7	8-30

PLANT SAMPLE ID						PLANT SAMPLE INFORMATION	
LAB NO.	P9162	P9163				SOIL TYPE	
FIELD ID	Good	Bad				FERTILIZER	
						CHEMICALS	
CROP	Blueberry	Blueberry				IRRIGATED	
VARIETY	Duke	Duke				PREVIOUS	
%N	1.71	1.66				PLANTED	
%P	0.08	0.08				SAMPLED	7/4/2019
%K	0.42	0.4				STAGE	
%Ca	0.47	0.47				PLANT PART	Leaf, middle
%Mg	0.15	0.13				SYMPTOMS	
%S	0.12	0.12				DURATION	
Na, mg/kg	7.5	4.5				TEMP	
Fe, mg/kg	31.3	30.2				RAIN	
Mn, mg/kg	196	208				LAB NOTES	
Zn, mg/kg	8.7	9.4					
Cu, mg/kg	2.6	3					
B, mg/kg	18.1	17.5					
Cl-, mg/kg (H2O extract)							
NO3-N, mg/kg (Salicylate Method)							







# Water Soluble Fertilizers

- Urea
- Ammonium Sulfate
- Potassium Sulfate
- Magnesium Sulfate
- Complete Fertilizer labeled as water soluble or greenhouse grade
- Micro Nutrients

## 20-20-20

A WATER SOLUBLE PLANT FOOD CONCENTRATE

GUARANTEED ANALYSIS	
Total Nitrogen (N)	20.00%
4.0% Ammoniacal Nitrogen	
6.0% Nitrate Nitrogen	
10.0% Urea Nitrogen	
Available Phosphate (P <sub>2</sub> O <sub>5</sub> )	20.00%
Soluble Potash (K <sub>2</sub> O)	20.00%
Boron (B)	0.02%
Copper (Cu)	0.05%
0.05% Chelated Copper (Cu)	
Iron (Fe)	0.10%
0.10% Chelated Iron (Fe)	
Manganese (Mn)	0.05%
0.05% Chelated Manganese (Mn)	
Molybdenum (Mo)	0.0005%
Zinc (Zn)	0.05%
0.05% Chelated Zinc (Zn)	

Derived from urea, ammonium phosphate, potassium nitrate, boric acid, copper EDTA, iron EDTA, manganese EDTA, sodium molybdate, and zinc EDTA.

**KEEP OUT OF REACH OF CHILDREN**



**WARNING**

Harmful if inhaled. Causes eye irritation.

**PRECAUTIONARY STATEMENTS**

Avoid breathing dust. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling.

**FIRST AID**

**IF INHALED:** Remove person to fresh air and keep comfortable for breathing. Call a poison control center or doctor for treatment advice if you feel unwell.

**IF IN EYES:** Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

In case of medical emergency, call toll free 1-877-424-7452.

For Emergency, Spill, Leak, Fire, Exposure, or Accident, Call:  
CHEMTREC 1-800-424-9300

**DIRECTIONS FOR USE**

CROPS	LBS/ACRE	REMARKS*
Alfalfa	5	On alfalfa grown for seed, 3-4 applications are recommended. On alfalfa grown for hay, apply after each cutting when leaves are formed.
Apples, peaches, pears, and other fruit and nut crops.	5-10	Apply with pre- and post-bloom sprays.
Blackberries, boysenberries, raspberries and other small fruit crops	5-10	2-3 applications before bloom (flowering); 1 application after fruit set.
Brussels sprouts, cabbage, Cauliflower and other brassica crops.	5	Apply at 7-10 day intervals using minimum 4 applications. A wetting agent may be added to ensure good coverage. Do not apply more than 1 lb. to Chinese cabbage.
Celery, lettuce, endive and other salad crops	5	Apply at 7-10 day intervals throughout the main growing season as soon as the 3rd and 4th leaves unfold.
Wheat, barley and rye	5-10	Begin after crop comes out of dormancy and continue at 2-3 week intervals.
Citrus	5-10	Apply at 7-10 day intervals. Use the higher rate for full bearing trees.
Corn	5	Begin when corn is approximately 8 inches high. Continue at 1-2 week intervals.
Beans, peas and other vegetables	5	Begin applications after second leaf unfolds up to bloom, at 1-2 week intervals; 1-2 applications after pod formation.
Cotton	5	Begin after formation of the second leaf for a total of 4-8 applications depending on growing conditions.
Cucumbers, melons, squash and other vine crops	5	Begin as soon as the second true leaf unfolds for a total of 6 applications.
Grapes	5-10	Apply with routine crop protection spray.
Hops	5-10	Apply 2 treatments 14 days apart when vines have grown halfway to the wires.
Onions	5	Apply at 5 leaf stage and continue applications on a 14 day schedule through bulking.
Peanuts	5-10	Apply in routine crop protection sprays.
Rice	5-10	Begin 3 weeks after emergence and continue at 7-14 day intervals.
Soybeans	5-10	Begin applications after second leaf unfolds up to bloom, at 1-2 week intervals; 1-2 applications after pod formation.

# pH Adjustment

- Sulfuric Acid pump= \$4,000
- Sulfuric Acid cost about \$50/acre/year
- Lowers 7.8 pH city water to 4.5 pH



# Drip Irrigation Images

(Courtesy of Bill Cline, NCSU)



This growers used a rigid plastic tubing for irrigation and inserted a drip emitter near each plant.



Perforated drip tubing that waters the length of the row may be a better choice, since there is less chance of a single emitter water-logging the soil around an individual plant; however, water quality must be good— may require sand filters, disk filters and/or acidification.





Single pressure-compensated drip line 18" emitters.  
Temporary, establishment on sandy site  
Bladen Co., North Carolina





# Double drip line over weed mat

## Parlier, California





# Emitter(s) at plant Volcanic soil Chile





# Drip lines with built-in emitters

## Spain





# Thank You!

**Ryan Neal**

County Extension Agent

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