RUTGERS COOPERATIVE EXTENSION

NEW JERSEY AGRICULTURAL EXPERIMENT STATION

- DRAFT -

New Jersey Growers' Irrigation Log Charts

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The purpose of this Log Chart is to make it easier for you and your farming operation to meet state recordkeeping requirements for your water certification. Our goal is to assist you with this document to allow you to ensure your water diversion rights in future years. A pocket-sized version is also available through your county Rutgers Cooperative Extension office.

We recognize growers have multiple field sites, pumps, diversions and many different types of irrigation equipment. This log has been designed to meet your needs.

How to Use This Log Chart

Use this Log Chart on a daily basis to record irrigation. Recording just pump gpm x hours may overstate actual water use. Rutgers recommends calculating water use in Log Chart column D based on the actual equipment used. We referenced several types of irrigation equipment and created sample logs for comparison. For multiple irrigation sources with multiple daily irrigation events it may be best to use a separate page for each diversion source.

Remember that when irrigating you may not be using the maximum pump capacity and therefore should not be recording your use as such.

Convenient Information

gpm or gph = gallons per minute or per hour.

1 acre = 43,560 sq. ft.

1 acre inch of water = 27,150 gallons.

Peak water use demand of 0.2 inch/acre/day (5,430 gal) for row crops is recommended as reasonable value.

Fruit trees may need from 12 to 30 gal/tree/day when bearing.

For help with calculations, predicting crop water needs, available soil water based on soil types and depth of crop rooting, contact your local Rutgers Cooperative Extension county office. Knott's Handbook for Vegetable Growers, 4th Ed., has many useful tables pp. 219-266 and 511-512. For irrigation water management and system design, which may qualify for USDA EQIP cost share programs, contact your local USDA NRCS office.

Drip Irrigation Management Example for Vegetables

Irrigation wetting to the proper effective soil rooting depth (varies by crop) is recommended on or before soils are ½ depleted of their available soil water. For example, wetting soil to 12 inches for shallow rooted crops needs from 1/3 inch of water on coarse sandy loam soils to 3/4 inch on loam soils. This affects how many hours the system is run. The Rutgers Commercial Vegetable Production Recommendations has tables to simplify calculations.

Drip emitter rates vary. A typical 0.5 gpm/100 row ft. drip line on 5 ft. row centers is about 8,500 row ft/acre and uses 42.5 gpm (2,550 gph).

One acre inch of irrigation water is 27,150 gallons. Using the example of 0.5 gpm drip line above we can calculate the gallons needed and run time.

27,150 g/acre inch x .33 inch = 8,960 g/acre needed per irrigation to irrigate sandy soils and 20,363 g/acre (27,150 g/acre inch x .75 inch) to wet loam soils to 12 inch depth.

8,960 g/acre ÷ 2,550 gph emitted = 3.5 minimum hours run time for 1/3 inch irrigation. More frequent irrigations of less duration will not wet soil to desired rooting depth.

To figure out how many emitters you have per acre, find out the spacing of emitters on the drip tape and the total row feet you have per acre. After finding out how many total row feet per acre, divide that number by the spacing between emitters. If you had a 12 inch spacing between emitters and 8,500 row feet per acre, the calculation would be 8,500 ÷ 12 =708 emitters per acre.

During peak summer growth with no rainfall, the crop soils will need at least 1.4 inches/week (0.2 inch/day) of water. If 3.5 hours delivers .33 inch, then it requires a minimum of about 15 hours weekly run time to deliver 1.4 inches. This could be done with 5 hours on alternate days to make management more convenient. Check soils with tensiometers, watermark sensors or by feel to adjust irrigation run times as needed. Some growers are also utilizing evapo-transpiration models to schedule irrigation.

We do not generally consider infiltration rates when drip irrigating in southern New Jersey. However caution should be used to not overwater (i.e., use excessive run times) on clay or compacted soils or if there is risk of Phytophthora blights. Excessive run times can move the water and nutrients past the root zone.

Irrigation Use Record Keeping Chart

A **Date of Water Use**	B **Irrigation Source Name or #**	**C** Hours per day	**D** (use one of the following calculations) 1) gph = gpm pumped x 60 min. 2) gph = sprinkler gpm x # sprinklers x 60 min. 3) gph = drip gpm per 100 row feet x # row feet per acre ÷ 100 x 60 min. 4) gph = drip gpm per acre x 60 min. 5) gph = drip emitter gph x # emitters	E Daily Total = Hours x gph (gallons per hour) = C x D

THIS SHEET MAY BE DUPLICATED TO MAKE ADDITIONAL COPIES FOR YOUR RECORDS

Resources

2002 Rutgers Commercial Vegetable Production Recommendations, pgs B20 -22.
Knott's Handbook for Vegetable Growers, 4th Ed., pp. 219-266 and 511-512.

Websites of Interest

University of Nebraska Irrigation Website at
http://www.ianr.unl.edu/pubs/Irrigation/index.htm

USDA Water Management Research Unit at http://www.cprl.ars.usda.gov/wmru.htm

USDA Web Links to other Irrigation Information at
http://fresno.ars.usda.gov/wmrl/Otherlinks.html

Washington State University Irrigated Agriculture and Extension Center at Prossor, WA at http://www.prosser.wsu.edu/

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