



Consumptive Water Use Restrictions in the Delaware River Basin

Albert R. Jarrett, Professor of Agricultural Engineering

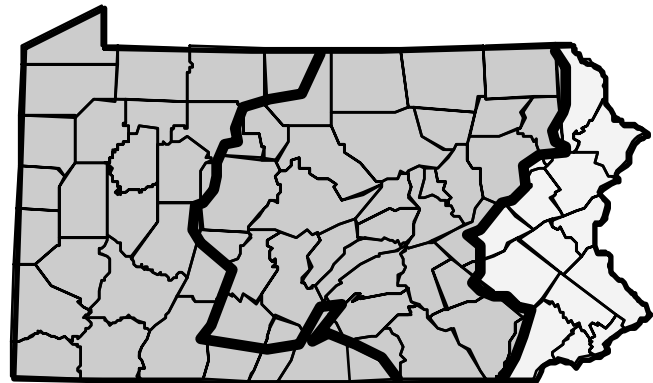
Note: The regulations discussed herein apply only to growers located within the Delaware River Basin.

What is Consumptive Use?

The Delaware River Basin Commission defines **Consumptive Use** as "water used by vegetation in the process of growth, including that stored in the body of the plant and that dissipated from its leaf and body surfaces by transpiration, or water incorporated in a product or animal." Consumptively used water is water, whether taken from a ground or surface sources, that is not available for reuse by others in the river basin. Or it can be viewed as water that is lost to the atmosphere and must be re-condensed into the liquid state before it is available for use. In times of lower than average rainfall, or drought, consumptive use of water becomes a major concern.

Who or What Activities Consumptively Use Water?

- An acre of corn on a hot July day will take about 9000 gallons of water from the soil to facilitate plant growth. Most of this water is transpired back to the atmosphere through the corn leaves. This water is consumptively used water.
- When you flush your toilet about five gallons of water are used or when you do a load of laundry about 30 gallons of water are used. Most of this water is returned to the surface or groundwater after treatment. This water is generally not consumptively used but could be considered consumptive use if the water transpires through the grass growing over an on-lot sewage system.



ARJ/12

Agricultural Consumptive Use

Agriculture is one of the largest consumptive users of water. About 600,000 gallons of water is required each year to grow an acre of any crop. Though this varies from crop to crop, 600,000 gallons is a lot of water. This is water that is put into the soil, either from rainfall or from irrigation and is removed by the crop a little each day as the crop grows. Almost all of this water is transpired to the atmosphere in the form of vapor (a small amount is stored in the plant tissues). The vapor is not available for further use until it re-condenses and falls to the earth as rain again.

In the Delaware River Basin there are no specific limitations by quantity for consumptive use of water during a drought emergency or any other time. Instead, certain water uses are either banned or restricted during State-declared drought warnings or emergencies. To date, the Delaware River Basin Commission, has not restricted water use for food crops or livestock even during drought emergencies.

The Delaware River Basin Commission issues allocation permits for surface and ground water users on a water withdrawal basis. Users who withdraw greater than 100,000 gallons per day from the Delaware River Basin are required to obtain a permit from the Delaware River Basin Commission. For users located in the Southeastern Pennsylvania Ground Water Protected Area, this unrestricted limit is 10,000 gallons per day. Typical crop irrigation is considered to be 95% consumptive use.

To assess whether you are in need of a Delaware River Basin Commission water use permit, it is necessary to estimate the volume of water you expect to use. The following table estimates the acreage of several crops you can probably irrigate with drip or sprinkler irrigation systems before you would likely use the 10,000 or 100,000 gallons of water in Pennsylvania.

Table 1. Land areas that may be irrigated before registration is required.

	Irrigation Type	Maximum Area That Can Be Irrigated With	
		10,000 gpd	100,000 gpd
Potatoes	Sprinkler	2.4 acres	24 acres
Apples	Drip	9.1 acres	91 acres
Peaches	Drip	7.6 acres	76 acres
Sweet corn	Sprinkler	2.5 acres	25 acres
Strawberries and Brambles	Drip	10.7 acres	107 acres
Strawberries and Brambles	Sprinkler	3.6 acres	36 acres
Tomatoes	Drip	7.4 acres	74 acres
Vegetables	Drip	12.9 acres	129 acres
Turf	Sprinkler	3.4 acres	34 acres

Are you using more than 100,000 gallons of water per day (more than 10,000 gpd if you live in Southeastern Pennsylvania)? Do you anticipate starting a water use project such as irrigation? If the answer to either of these questions is yes, you need to contact the Delaware River Basin Commission. The Delaware River Basin Commission has the authority to regulate water usage within their jurisdiction. They are also very helpful in assisting you with the planning of large water use projects. If you have questions, please contact:

Delaware River Basin Commission
P.O. Box 7360
West Trenton, NJ 08628
(609) 883-9500
www.state.nj.us/drbc/drbc.htm

or your county extension staff.

PSU
1st Edition 09//02

For a copy of our Fact Sheet Listing contact:
Agricultural and Biological Engineering Department
246 Agricultural Engineering Building
University Park, PA 16802
Telephone: 814-865-7685 FAX:814-863-1031