a technical service bulletin
from Ecologel Solutions, LLC

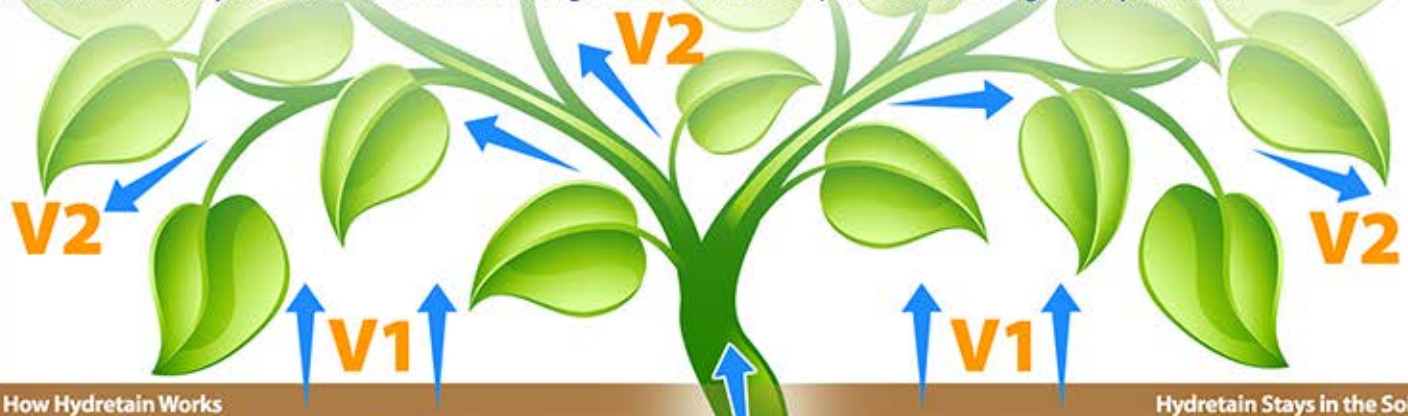
How Hydretain® Works

ROOT ZONE MOISTURE MANAGER

Hydretain is a totally unique concept in root zone moisture management that effectively reduces the overall watering requirements of plants, shrubs, trees, turf and agriculture by as much as 50% or more. Hydretain is not another wetting agent, surfactant or super absorbent polymer crystal. It is actually liquid group of hygroscopic and humectant components that attract moisture like tiny "water magnets" and make available to plant roots microscopic moisture which would otherwise be lost to evaporation.

Material/Function

Hydretain is a unique liquid formula containing a group of synergistic organic derivatives. In combination these derivatives create a sub-surface film which absorbs and stores moisture as microscopic droplets on plant roots and soil particle surfaces. Hydretain continually draws additional moisture through the soil to the root zone where it is needed most in the plant-soil system. The end result is increased effectiveness of watering, light rainfall, dew and even humidity in retaining significant moisture levels in the soil of containerized plants as well as flower and shrubbery beds. The times between watering of indoor and outdoor plants can thus be significantly extended.



How Hydretain Works

We must first examine how Hydretain affects moisture movement and availability within the plant-soil system. Regardless of whether plants are grown in the ground or in containers, moisture is constantly being drawn up through the soil by capillary action and vaporized into the air (VI). Moisture is also extracted from the soil by plant roots, transported up the stem and transpired into the air through the leaf stomata (V2). Moisture loss from both the plant and the soil is accelerated by temperature, wind, and rate of growth.

Hydretain Works Two Ways

First of all, Hydretain slows the evaporative loss of moisture from the soil by attracting moisture (Hygroscopic) and holding this moisture (Humectant) within the soil particles. Second, as a result of reduced evaporation, the lateral movement of moisture into the vicinity of the root zone is dramatically improved. This moisture is then held within the Hydretain film, readily available to the root system.

The water component of this film, which is in contact with the root cells, is then absorbed into the plant through the process of osmosis, a process which occurs in living cells. With osmosis, water moves through cell membranes from a dilute solution into a concentrated one. Fluid in plant cells is normally more concentrated than in soil solutions surrounding them. Moisture tends to move from a relatively weak Hydretain solution through the semi-permeable membranes into the root cells.

Hydretain Stays in the Soil

Because Hydretain is composed of large complex molecules it cannot pass through the plant cell membranes into the plant roots. However, water molecules, being much smaller, are able to move into the plant roots from the surrounding film of dilute Hydretain. As the water moves into the plant the Hydretain component remains in place continually seeking additional moisture.

Hydretain Is Eco-Friendly

Hydretain is biodegradable and contains no derivatives of any petrochemicals, phosphates, or other toxic fractions that may cause groundwater or runoff contamination.

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