

AN IRRIGATION • Irrigation System INVESTIGATION • Research



Variable Rate Irrigation

The Rise of Irrigation

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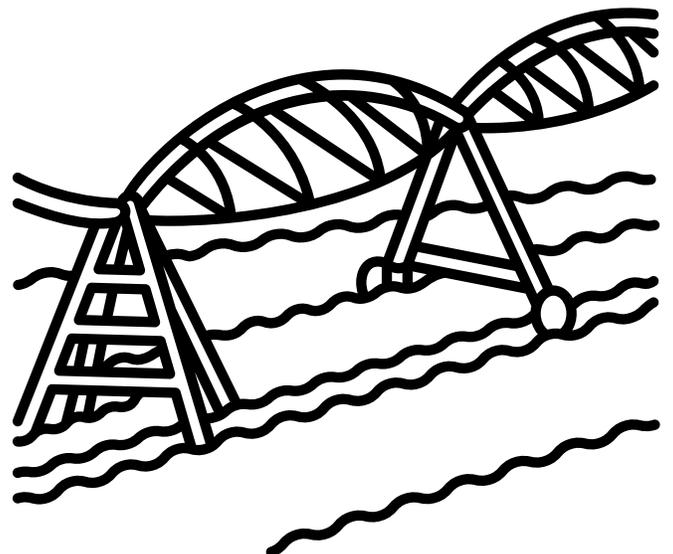


Irrigation systems have become commonly used in agriculture, even in hobby farming. Today, many farmers need to water their crops to have a successful yield. The precise application of water helps crops grow in dry areas or during periods of drought. Irrigation lets farmers use just the right amount of water. This is important because water is a **natural resource** and needs to be protected.

What is Variable Rate Irrigation?

The **variable rate irrigation system** was invented in the early 2000s by scientists at the University of Georgia. This system uses rotating machinery to water crops from above. It can apply a different amount of water to different parts of the field. This is helpful because uneven ground can lead to areas that are too dry or too wet. This can cause poor yields. This was important to the scientists because of Georgia's dry climate and hilly landscape.

Variable rate irrigation systems are used in all climates, usually in areas with a lot of hills. The variable rate irrigation system is commonly used on farms because it can put water exactly where it is needed. This reduces the amount of water a farmer needs.



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Sprinkler Irrigation



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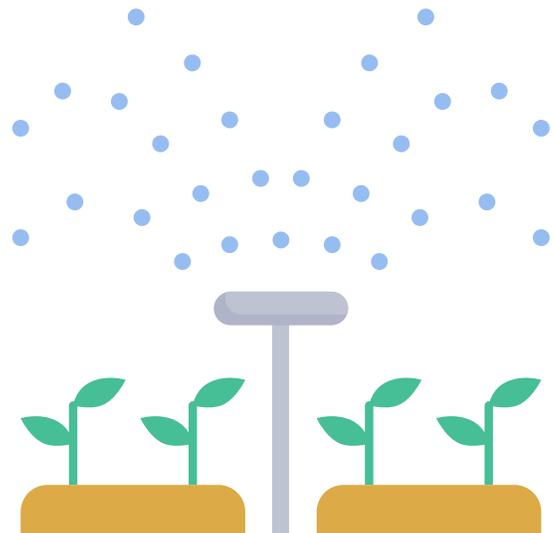


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What is Sprinkler Irrigation?

The **sprinkler irrigation system** was invented in 1894 by a farmer named Charles Skinner. This system uses pumps, pipes, and sprinklers to spray water on crops like rain. The sprinklers can be on the ground or in machines above crops. The sprinklers evenly water crops in a field. This is a good option for even, flat pieces of land.

Sprinkler irrigation systems are commonly used in dry, flat areas. It can also be very helpful during droughts. However, this system should not be used with fragile crops like lettuce because the water droplets can damage the crop. This system helps farmers conserve water by evenly watering their field. This decreases how much water a farmer needs.



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Drip Irrigation



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What is Drip Irrigation?

In Israel in 1959, the **drip irrigation system** was invented by a father and son, Simcha and Yeshayahu. This irrigation system applies the exact amount of water a crop needs right to its roots. This is helpful because other irrigation systems lose water to natural events that this system can avoid. For example, hills can cause **runoff** and heat can create **evaporation**. This can cause areas that are too wet or areas that are too dry.



Today, drip irrigation systems are used all over the world and in many different biomes. They are used with a large variety of crops, including **specialty crops**. This system conserves water. This is because it avoids runoff and evaporation by applying water right to the roots of the crops.



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Furrow Irrigation

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What is Furrow Irrigation?

The **furrow irrigation system** is one of the oldest methods of irrigation. It was first invented in Egypt and Mesopotamia. This irrigation system supplies water to crops through shallow, evenly spaced **furrows**. This helps farmers in areas that flood often because the water can be slowly diverted to the crops. This protects the crops from being overwatered.



Today, furrow irrigation systems are used in flat areas that flood often. This system is commonly used with **row crops** like cotton, maize, and sugar cane. This system conserves water by repurposing flood waters. This way, a farmer can reduce or eliminate the amount of water they apply to their crops.



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Terrace Irrigation

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What is Terrace Irrigation?

In 1000 AD, the **terrace irrigation system** began to be used by people living in the Andes. It was later used in other areas of the world, like in Southeast Asia. This irrigation system features "steps" on hillsides, held in place with rocks, soil, or wood. Each "step" is irrigated with water that travels down the mountainside from springs, rivers, or rain. This system can capture that water and help avoid **runoff**.



Today, terrace irrigation systems are commonly used in areas with hills or mountains. This system is commonly used to grow rice, wheat, and barley crops. Terrace irrigation systems help farmers take advantage of the natural water resources that already exist. As a result, terrace irrigation can be an effective way to conserve water.

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Sub-Irrigation

The Rise of Irrigation

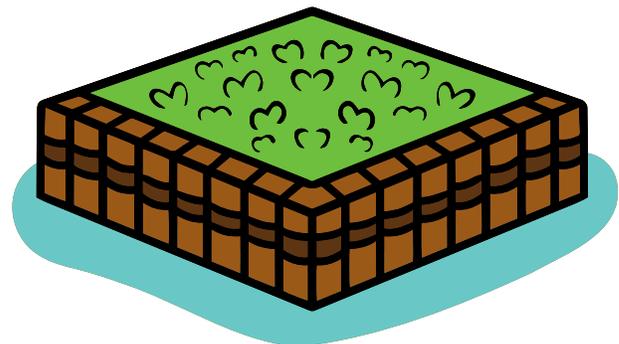
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What is Sub-Irrigation?

The **sub-irrigation system** has been used for over 3000 years. The Aztec Empire used this system in Mexico City, then called Tenochtitlan. The city was on top of a lake, so the Aztecs used the roots of plants mixed with dirt to create floating patches of land (**Chinampas**). These pieces of land were naturally watered from the lake beneath them. This system waters plants from the bottom, rather than the top. This can be done by raising the **water table**. Farmers can use rain or flood water in their sub-irrigation systems, repurposing water from the environment.



Sub-irrigation systems are commonly used in areas with a naturally high water table. This system uses natural processes to conserve water in agricultural production.