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WATER MEASURE FOR IRRIGATION

Supt. Powers Gives Talk No. 2 to the Farmers in Regard to Measuring Water They Use for Irrigating—Valuable Information Given

The greater part of the land in irrigated sections would be practically worthless without water with which to irrigate it, yet we give far less attention to water measurement than to land measurement. Land in this section without water may be secured at from $2 to $10 per acre while the water costs the settler from $25 to $60 per acre. No one would think of buying a farm without having its boundaries located by a competent engineer, yet most irrigators accept the water given them without question, though it is several times as valuable as the land to which it is applied. He should have a working knowledge of the measurement of water in order to provide the right capacity of pump or proper size of lateral for the acreage in question. The irrigator should learn how much water is used on each particular field and crop in order to determine the water requirement of different crops and the most economical use of water. If every irrigator would install a measuring device in his head ditch and learn to measure water accurately so he could tell when he was getting the amount of water due him, there would be less contention in irrigated districts.

Units of Measurement

The principal units used in measuring water are (1) the second foot; (2) the miner's inch; and (3) the acre foot.

The second foot is the best unit for the measurement of flowing water and is equivalent to a cubic foot of water passing a given point each second. The second foot then delivers 60 cubic feet per minute, or 3600 cubic feet per hour, or 86400 cubic feet in a day of approximately 24 hours. This would cover an acre approximately two feet deep. The second foot also equals 7½ gallons per second, or 450 gallons per minute.

A Miner's inch in Oregon is defined by law as being the amount of water which will flow through a one inch orfice under a 6 inch pressure. It is an arbitrary unit for measuring water by its flow through a prescribed orfice. The spillback is a common arrangement for maintaining a constant head above the opening. In Oregon 40 miner's inches are legally equivalent to a second foot. Fifty miner's inches with a 4-inch head is approximtaely one second foot. The term is borrowed from the miners and is not a definite, satisfactory unit. One half miner's inch per acre for 100 days equals 1.98 feet deep on the land.

The acre foot simply means water enough to cover uniformly 1 acre 1 foot in depth, being 43,560 cubic ft. Three acre feet is approximately 1,000,000 gallons. The acre foot is convenient for defining large quantities of standing water in reservoirs The depth in acre inches and number of irrigations correspond to inches rainfall and can be readily understood.

The discharge of a stream is always the product of the mean velocity in feet per second times the cross sectional area in square feet, and this gives the quantity in cubic feet per second discharged. The velocity must be obtained by use of floats, with a current meter, or by formula used in connection with a standard orfice or weir.

Weirs and Weir Measurements

The most accurate, practical and economical method of measurement of moderate amounts of water yet devised is the weir measurement. The weir is a thin notch of definite shape which the water is caused to flow over. The amount of flow depends on the length of crest or bottom of the notch and the depth of water flowing over the crest. There are several forms of weirs and conditions governing their location are the same, the only difference being in the shape of notch and formula used in computing the discharge. The Cippoletti or trapezoidal weir, which is named for an Italian engineer who perfected it, is about the most accurate and is becoming most generally used in the west. This weir is trapezoidal in shape with straight bottom and with sides having a run of 1 to 4 of rise. A one foot trapezoidal weir has a crest width of one foot and is 16 inches wide 8 inches above the crest. The crest and sides should be sharp on the upstream side and the water should have free spillway. For experimental work the crest is made of sheet metal to secure great accuracy. When all conditions are met carefully this weir will measure water with an error of less than one per cent.

In order to prevent leakage under or around the weir and add stability the weir is often provided with a weir box, and this must be large enough in proportion to the notch to eliminate friction and excess velocity of approach. This requires a box with a cross section of at least seven times the area of the notch. The distance from the crest to the sides should be twice as great as any possible depth of water flowing over the crest, and the distance from crest to bottom should be three times the depth of water that may flow over. The weir plate must set plumb, and the crest level and the length of the crest should be at least three times the depth of water flowing over it. With the proportions given there will be no appreciable velocity of approach, not over 6 inches per second. The hook gage or peg for measuring depth should be located at least three feet up stream from the crest to avoid draw down, and should read zero or set flush with the water surface when the water is on a level with the crest and just ready to break over.

It is not possible in this short article to go into details regarding principles and higher mathematics involved in the use of the weir. Engineers have experimented for years and found that under like conditions the same depth always produces the same discharge over a given sized weir. The amount of water passing through each second depends on the area and the gravity head, also the side slope, location of weir, contraction and cohesion. All of these are represented in the formula which has been evolved and which is:

Quantity—3.367 x the length in feet x the height in feet 2.

That is, the height in feet or decimals of a foot is cubed, and the square root then obtained after which it is multiplied by the length in feet and then by the constant, 3.367.

In order to save calculations a weir table is usually employed which gives the discharge for all possible depths and various lengths, the values having been computed from the above formula.

A Few Precautions

Avoid setting a weir just below a curve in a ditch as it causes water to go to one side.

Do not set a weir close to or just below a headgate where is a high velocity.

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SHOW PEOPLE INVEST HERE

This Part of Central Oregon Appealed to Some of the Wild West Officials and They Will Return Later and Invest In Property

The Redmond District looked so good to some of the officials of the Wild West show that was here last week that they will return later and invest in land.

Owen Dowd, assistant manager of the 101 Ranch Wild West, stated to The Spokesman that we had the garden spot of Oregon right here, and that this fall he was going to make a trip back here and buy a chunk of land.

He said he had some land in N. Y. state, near Syracuse, that all he could raise on it was his hat. He has a 22-acre chicken ranch in Florida that eats up money, and he is next going to invest in some of the irrigated land around here to see if can't even up on the losses on his other property.

Other members of the executive staff of the show talked along the same line as Mr. Dowd, and said they wanted to put some of their money in our gold dollar producing soil.

FELL OFF TRAIN

Terrebonne Oregonian, June 14: Frank Carr, an engine tender in the employ of the O-W. R. & N. R. R., who had been up to Redmond with one of the engines pulling the Wild West special, fell off the rear end of the caboose of the second section of the show train at Opal City about 3 o'clock this morning. He was badly bruised about the head and body, but managed to crawl to the Hotel Opal where he remained until the morning passenger came along when he was picked up and taken to the hospital at The Dalles.

CAN GET YEAR BOOK

The department of agriculture at Washington has just issued its 1911 Agricultural Year Book, a bound volume of several hundred pages, containing much interesting and instructive information regarding agriculture, horticulture, stock raising, etc. Each senator and representative has copies of this Year Book for distribution, and any farmer can secure a copy by sending to one of the members of the Oregon delegation.

REDMOND WAS MECCA FOR ALL

People From All Parts of Crook County Came Here Last Week to Attend the Wild West Shows—Big Crowd Is Well Taken Care Of

Nearly 3000 paid admissions to the 101 Ranch Wild West that was here last Thursday proved that Redmond was a good circus town—that it was the logical center of Central Oregon. The show people were extremely well pleased with the large crowd, and stated that their faith in Redmond was well founded.

People began arriving in the city the day before the show. Many came in wagons and camped on the outskirts of the city, while others put up at the hotels and lodging houses.

And it was an orderly crowd, too. Although a number of special police were on duty there was little for them to do. Chief of Police McClay stated that drunken and disorderly men were very few, and there were no arrests.

Ample preparations has been taken to house and feed the visitors and all were well cared for.

Owing to the lateness of the show trains reaching the city, all of the performance could not be given, as the show had to pack up and leave here as early as possible in order to reach Pendleton in time to give an afternoon performance the next day. To some of the people, those who had seen the real wild west on the plains, the show seemed tame, but it compared favorably with Buffalo Bill's Wild West, and the majority of the people were satisfied.

One point has been established, and that is: That Redmond is the best circus town in Central Oregon, and in the future this city will be included in the route of circuses when laying out their Oregon schedule.

WILL DEDICATE CHURCH

The new Baptist church that was opened for services last Sunday will be dedicated on Sunday, June 30th, with appropriate services. Dr. C. A. Wooddy, superintendent of missions for the Pacific Coast and Rocky Mountain district, will be present and preach the sermon of dedication. Rev. Fred Parker of Portland, will also be present. The full program will be given next week.

The Spokesman for good printing