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Ag Water NetWORK

WEBINAR #2 Highlights – Irrigation Efficiency and Consumptive Use

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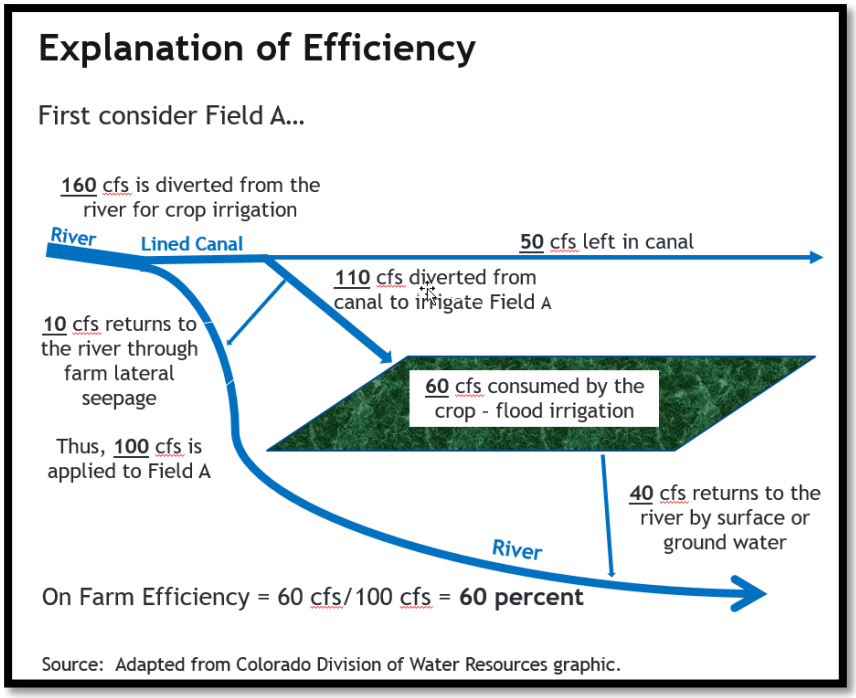
Irrigation Efficiency and Consumptive Use: Facts and Myths

(Kevin Rein; State Engineer, Colorado Division of Water Resources)

- Consumptive Use is that amount of water permanently taken out of the stream system by application to the decreed use.
- Efficiency is the ratio of the amount of water consumed versus the amount of water diverted. For example, if 100 acre-feet is applied on a field but only 60 acre-feet is used by the crop, then the irrigation efficiency is 60 percent.
- Improving irrigation efficiency typically does not reduce the consumptive use volume and may actually increase consumptive use by delivering water more effectively to the crop.



- Conservation results in reduced consumptive use.
- Diversion is the the amount of water diverted from a river or other water body.
- *Beneficial Use* is the amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the use for which the appropriation is lawfully made.
- The amount of water diverted but ***not*** consumed is considered “return flow.”
- “Waste” is the diversion and/or application of more water than is reasonably needed to meet the consumptive use of the crop.

- Diverting / applying *more* water than is needed for the intended use will not increase the benefical use of a or maximize the water right and may obligate the diverter to meet greater return flow obligations.
- An agricultural water right usually describes a rate or amount of water that can be diverted in priorty and applied on a specific land parcel. A producer can fully maximize their water right in priority via irrigation efficiency improvements up to their decreed limits of water quantity and acreage. Note that it is possible, for example, on the Arkansas River, that such improvements may create an obligation to account for the increased consumption.
- If a producer upgrades his or her irrigaton system and is acting within their decree and causes a reduction of return flows, the producer is not obligated to ensure that return flows are the same for downstream users.
- In contrast, in a change of use case - such as from ag to municipal - the water right cannot be expanded under the new use. The change of use must also prevent impact (material injury) to other water users, including any return flow obligations.

High Mountain Water Use

(Bill Trampe, CCA Member, Gunnison Area Rancher & Gunnison Basin Roundtable Member)

- Calves are born in April and vaccinated and weaned in October.
- Water is diverted for irrigation from the Gunnison River, the East River and smaller tributaries.
- Hay meadows are flood irrigated from around May 1 to mid-July, when irrigation is paused to cut hay. After hay is harvested, meadows are irrigated again if adequate water is available in order to stimulate forage regrowth for fall pasturing of cows and calves.
- Fields are forage covered and not cropped, thus soil erosion has never been a problem.
- Flood irrigation builds a temporary sub-soil aquifer beneath hay meadows which slowly drains back to the river via sub-surface flow throughout the summer and into late fall.
- Diverting water from the rivers to the hay meadows during high runoff periods helps moderate high flows, and return flows from fields supplement lower river flows later in the season.

Trampe Ranch irrigation ditch

- Return flows support aquatic life and enable recreational activities such as fishing and rafting during the traditional low-flow months of August and September.
- Groundwater return flows widen riparian corridors as water re-surfaces along river channels and embankments.
- Regardless of how water is used (agricultural, municipal, etc.), the challenge in Colorado going forward will be in figuring out how to make changes that allow all uses to continue.

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