

BULLETIN 353

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Irrigation Development in Montana
Part I. Water Supply



MONTANA STATE COLLEGE
AGRICULTURAL EXPERIMENT STATION
BOZEMAN, MONTANA

SUMMARY

1. Montana has about 146,000 square miles of watershed which drain into the Missouri and the Columbia rivers and into the Hudson Bay.
2. An average of 36,000,000 acre feet of water flows out of Montana annually, of which about 70 per cent originates in the state. This is equivalent to a depth of 3.2 inches over all the land area of the state, and represents about 20 per cent of the mean annual precipitation.
3. 85.3 per cent of the state is drained by tributaries to the Missouri River, 14.6 per cent by the Columbia River, and .1 per cent flows to the Hudson Bay; but of the water which leaves the state, 43.8 per cent flows east through the Missouri, 54.9 per cent west through the Columbia, and 1.3 per cent through the St. Mary which empties into the Hudson Bay—a geographical distribution which is unfavorable for its most complete use for irrigation.
4. The seasonal variation in the distribution of runoff also prevents complete utilization of the stream flow for irrigation, except through storage, as only about 60 per cent of the runoff occurs during the crop growing season. If the irrigated area were limited to the number of acres for which a full supply was assured during July and August, then only about 40 per cent of the summer flow could be used, or only 24 per cent of the annual flow.
5. The variability of flow of streams from month to month and from year to year makes necessary long-time stream flow measurement upon which to base plans for economical irrigation development. Runoff records should be continuous through many years to be of most value.
6. Since the possibilities for irrigation development come from the tributaries rather than from the main streams, gaging stations should also be established on these tributaries.
7. A comprehensive survey should be made—not alone of all the water resources in Montana, but also of their availability to the land where they could be used. Then plans for the most permanent benefits could be worked out.
8. Conservation of water implies putting it to the best use for the most people. If power systems were developed in the higher reaches of the streams, the water could also be used for irrigation in the valley below and yet further down on the larger rivers again be used for power.
9. Wherever possible the uses of water for irrigation, for power, for recreation, and for domestic purposes should be coordinated so as to enhance the value of such development.
10. It is recognized that the benefits of irrigation are enjoyed by many people other than those who live on the land actually irrigated. Merchants, transportation companies, manufacturers, banks, professional people, tradesmen, and the general public who live in or adjacent to the irrigation development, enjoy the benefits in an equal degree to the people who till the soil. Irrigation development will proceed much faster when all those who benefit contribute their proportionate share of the costs of irrigation development.
11. Special legislation will be needed to permit the organization of improvement districts with power to apportion the costs of irrigation among all who benefit from it.

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