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Guest Column

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Man's existence is dependent upon his water supply. History records the efforts of civilizations 5,000 to 6,000 years ago struggling with the problems of discovering underground water sources and/or managing and altering those found on the surface to better fulfill man's needs for domestic, livestock and irrigation use. Some of the earliest irrigation systems failed, but others have functioned successfully for over 5,000 years.

Irrigation in the United States is comparatively recent even though the early Spanish Conquistadors found the Indians in the arid southwest using irrigation for the production of maize and squash. With the settlement of the west in the 19th century, water resource development for mining, irrigation, municipal and agricultural use was essential to its growth and development as the water supply was the most frequent limiting factor. In 1902 the U.S. Government recognized the national interest in water resource development of the west by enacting the Reclamation Law. It made possible the use of Federal funds to develop water resource projects in the 17 western states. Many of these projects are multi-purpose with water storage and distribution for irrigation, municipal and industrial use, recreation facilities, hydro-electric generation and for the support of fish and wildlife. In the 75 years since passage of the Reclamation Act, the total cost of all Bureau of Reclamation projects is $7.5 billion. In only one year, 1975, the total gross sales from all Reclamation projects were $11.8 billion. From those sales the Federal government received $1.8 billion in taxes and $985 million went for state and local taxes. Thus, in only five years, Federal taxes alone would have more than paid the total cost. In addition, the projects are also paying back the capital investment made by the government on a long-term, interest-free basis.

On the eastern slope of the Rockies most rivers and streams eventually drain into the Mississippi River. Spring thaws from both the west and east of the river had caused annual flooding accompanied by extensive damages in some years. It had long been recognized that something must be done to

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In This Issue

On the cover: The Carrington Irrigation Station is a source of information about irrigation management in North Dakota. In this issue, Superintendent Howard Olson outlines the history and speculates about the future of irrigation in the state. (Photo by James Berg)

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Table 1. Summary of Number of Herds Processed, Number of Records Processed, Average Number of Calves Per Herd, and Average Adjusted Weaning Weight for the Last 14 Years.

Year	No. of Herds Processed	Total No. of Weaning Weight Records Processed	Ave. No. of Records Processed Per Herd	Ave. Adjusted Weaning Weight
1963	21	1228	58	454
1964	27	1728	64	447
1965	36	2157	60	436
1966	41	2622	64	455
1967	55	3676	67	469
1968	77	5887	76	496
1969	80	5958	74	486
1970	86	6691	78	473
1971	104	9375	90	472
1972	124	11260	91	472
1973	149	14751	99	490
1974	130	16144	124	480
1975	99	9812	99	483
1976	95	10167	107	499

The genetic evaluations are based on within-year comparisons of progeny groups. For each identified sire and dam the average number of pounds the progeny records are below or above the herd's yearly averages is calculated. These averages are then weighted in such a way as to account for the heritability of adjusted weaning weight and the number of progeny. The result is a genetic evaluation for adjusted weaning weight for each identified sire and dam. The individual weaning weights of the sires and dams cannot be used at the present time because sometimes the identification of the animal changes from the time it is a calf to the time it is a parent. This lack of unique and permanent identification is a troublesome and unfortunate problem because it means that a valuable source of information cannot be used. It is important that sire identification be recorded if possible so genetic selection from the male side of the pedigree can take place.

Table 2. Number of years of participation for herds that were processed in 1976.

Years of Participation	Number of Herds
1	15
2	4
3	7
4	20
5	17
6	3
7	7
8	3
9	6
10	3
11	2
12	3
13	3
14	2

Continued From Page 2.

control flooding and store the water for beneficial use. Various plans were proposed to the Government and in 1944 a Missouri River Basin Flood Control Act became law. Known as the Pick-Sloan Plan, it authorized the construction of large dams on the Missouri River. Water stored in the reservoirs would reduce flooding downstream and provide water for hydro-electric generation, downstream navigation, irrigation, municipal and industrial use, recreation, fish and wildlife enhancement. Congress, in preparing the enabling legislation, was aware of the divergent interests in the development and use of water resource. Downstream states, principle beneficiaries of flood control, recognized the two Dakota's would give up over a million acres of mostly river-bottom land for water storage reservoirs. To partially off-set this loss of productive land, they supported allocation of a portion of the stored water for irrigation development and the use of revenue from the sale of hydro-power generated at the dam sites to pay for a major portion of the irrigation project construction costs.

The original plans for irrigation in North Dakota were for lands in the northwestern corner of the state. As feasibility investigation proceeded in the late "forties" and early "fifties" it was determined that soils and topography in that area were not suited for the then proposed surface irrigation.

Table 2. Monthly precipitation totals recorded at the Dickinson Agricultural Experiment Station during the period 1969-1972.

	1969	1970	1971	1972	4-year average	81-year average
January	0.66	0.67	0.26	0.50	0.52	0.44
February	0.36	0.04	0.50	0.21	0.28	0.42
March	0.25	0.55	0.68	0.69	0.54	0.72
April	0.72	3.53	2.99	1.27	2.13	1.38
May	1.32	6.53	0.87	5.09	3.45	2.36
June	6.13	1.98	7.54	4.29	4.99	3.59
July	4.40	3.86	0.25	2.72	2.81	2.23
August	0.52	0.29	0.24	2.90	0.99	1.78
September	0.31	1.49	3.59	0.74	1.53	1.23
October	0.86	0.40	3.18	1.56	1.50	0.84
November	T	0.84	0.50	0.04	0.35	0.51
December	0.84	0.16	0.37	0.75	0.53	0.40
TOTAL	16.37	20.34	20.97	20.76	19.62	15.90

season. In this study only a very minor amount of stand deterioration was observed, although conditions normally associated with winter kill elsewhere may not have been present in the study area. The study has demonstrated the type of alfalfa management which may be the optimum for hay yields in the western portion of North Dakota.

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