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AGRICULTURAL PRODUCTION

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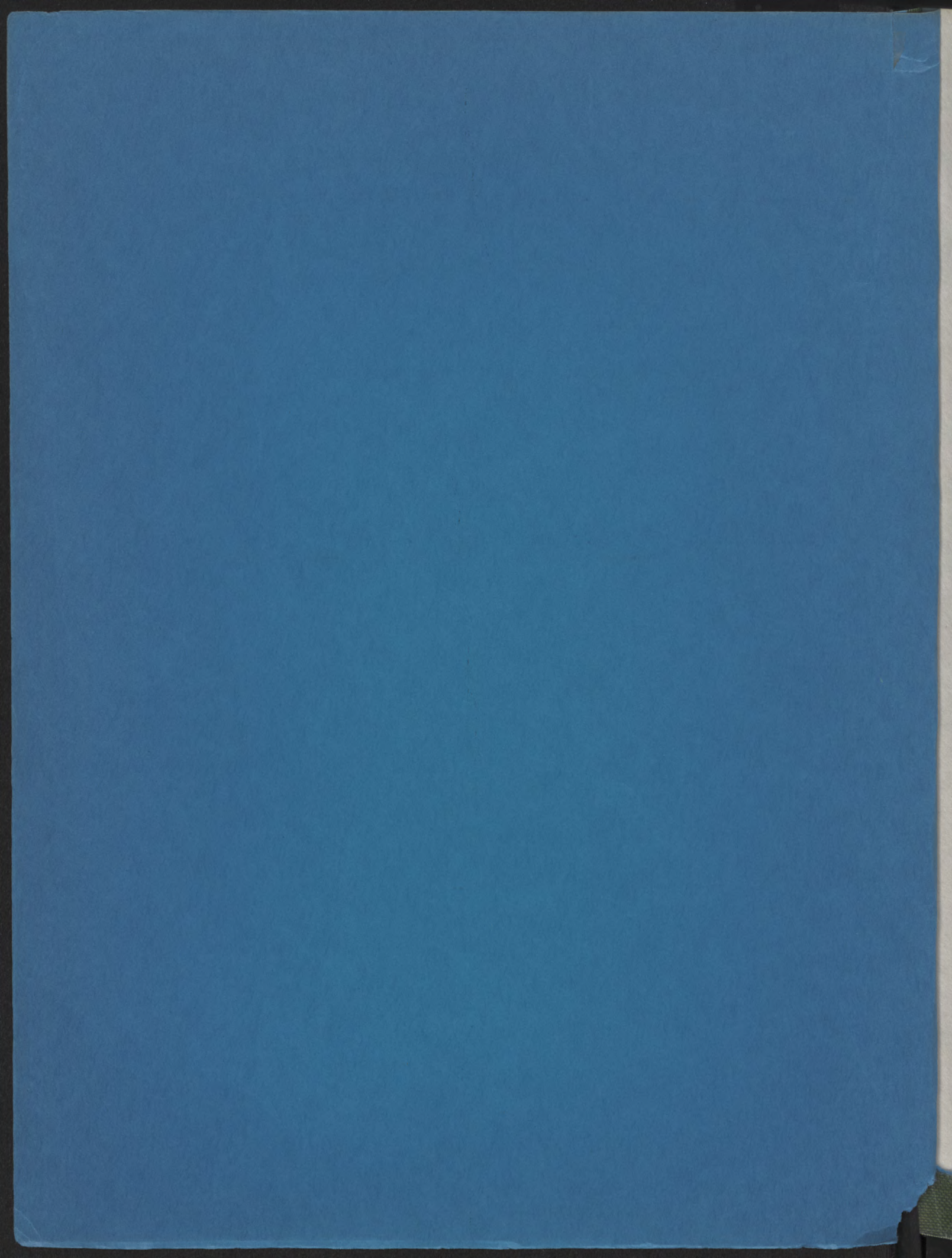
NATIONAL DEFENSE

by

E. Herbert Dyer, Agricultural Economist
and
Robert Barkley, Senior Hydraulic Engineer

December 1941

COLORADO WATER CONSERVATION BOARD
Clifford H. Stone, Director
C. L. Patterson, Chief Engineer
R. J. Tipton, Consulting Engineer



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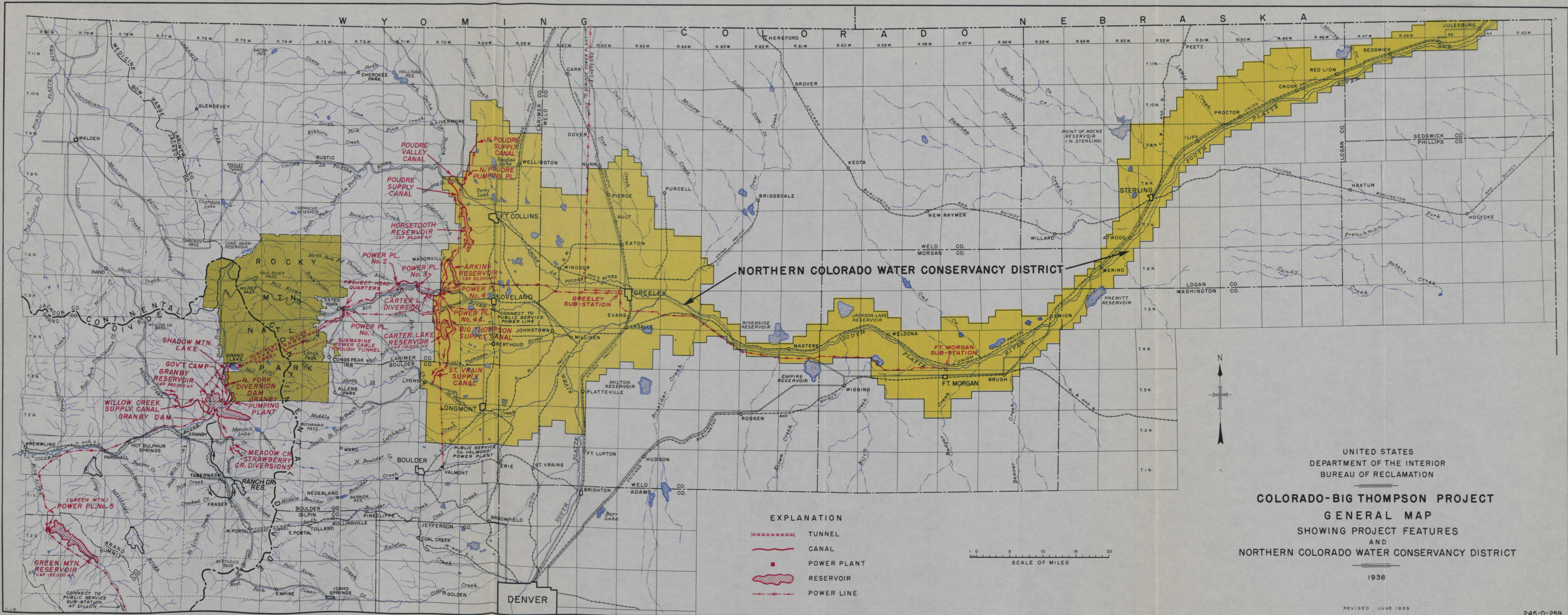
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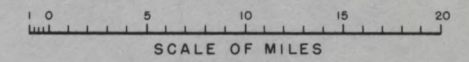


NORTHERN COLORADO WATER CONSERVANCY DISTRICT

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION

COLORADO-BIG THOMPSON PROJECT
GENERAL MAP
 SHOWING PROJECT FEATURES
 AND
 NORTHERN COLORADO WATER CONSERVANCY DISTRICT

- EXPLANATION**
- TUNNEL
 - CANAL
 - POWER PLANT
 - ▭ RESERVOIR
 - POWER LINE



1938

REVISED JUNE 1939

TABLE OF CONTENTS

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
	Introductory Statement	A
	Acknowledgements	C
	Summary	D
	Introduction	1
	Irrigated Acreage from which Crops are Harvested	2
	Production Goals - 1942	4
	Cropped Acreage Goals	4
	Sugar Beet Production	8
	Production Goals of Livestock & Livestock Products	11
	Livestock Feeding	13
	Lamb Feeding	13
	Cattle Feeding	16
	Hog Production	17
	Industries Related to	
	Agriculture	18
	Meat Packing	18
	Sugar Refining	19
	Milling	20
	Dairy Products	21
	Canning	23

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
1	Acreage & Value of Crops Harvested from Irrigated Lands versus Original Water Supply	3
2	Crop Production Goals for 1942 in percent of Increase over 1941 Crop Acreage Planted	5
3	Farm Defense Goals for 1942 for Crop Acreages in Northern Colo- rado Water Conservancy District	6

LIST OF TABLES - Cont'd

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
4	Livestock Production Goals for 1942 in percent Increase over 1940 & 1941	12
5	Number of Sheep & Lambs on Feed in Northern Colorado, 1923-1940	14
5A	Estimated Number & Value of Sheep & Lambs Fed in Northern Colorado, 1929-1940	15
6	Estimated Number & Value of Cattle Fed in Northern Colorado, 1930-1940	16
7	Production of Dairy Products in Northern Colorado	22

APPENDIX

I	Suggested Goals in 1942 for Principal Crops in Colorado	
II	Acreage of Principal Crops Harvested Under Irrigation - Northern Colorado Water Conservancy District (Avge. - 1929-1938)	
III	Percent of Total Acreage of Principal Crops Harvested under Irrigation - Northern Colo- rado Water Conservancy District (Avge. 1929-1938)	
IV	Acreage of Crops Harvested under Irrigation - Northern Colorado Water Conservancy District	
V	Total Value of Principal Crops Harvested under Irrigation - Northern Colorado Water Conser- vancy District (Avge. 1929-1938)	
VI	Percent of Total Value of Principal Crops Harvested under Irrigation - Northern Colorado Water Conservancy District (Avge. - 1929-1938)	
VII	Total Value of Crops Harvested under Irrigation - Northern Colorado Water Conservancy District	
VIII	Value per Acre of Principal Crops Harvested under Irrigation - Northern Colorado Water Conservancy District (Avge. 1929-1938)	

APPENDIX - Cont'd

- IX Sheep and Lambs in Transit - Northern Colorado
and Estimated Number to be Fed in 1942
- X Dairy Products - Northern Colorado Water
Conservancy District, 1935 and 1940 Consus

MAPS, CHARTS & GRAPHS

Map of Northern Colorado Water Conservancy
District and Features of Colorado-Big
Thompson Project Frontpiece

Chart 1 - Construction Schedule Opposite Page F

Graph 1 - Relation between Irrigated
Acreage Harvested & Original Water
Supply Opposite Page J

INTRODUCTORY STATEMENT

On June 24, 1937 the Congress of the United States authorized construction of the Colorado-Big Thompson project. Conceived for the development of both supplemental irrigation supply and power, this project will fulfill economic needs which have long existed in the South Platte River valley in Colorado.

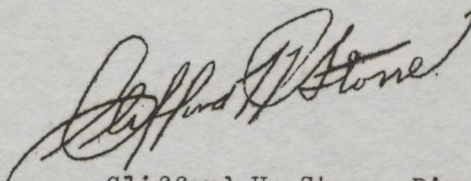
Since the inception of the program for national defense and, particularly since the entrance of the United States into war, attention has been focused upon the necessity for expanded industrial production and for increased production of agricultural food crops and food products. Quite naturally those projects which are now under construction and which, upon completion, will fulfill a vital part in the national war effort are being given increased attention and are being appraised in the light of what each project can accomplish toward the production of vitally necessary industrial and agricultural products.

The potential production and use of power under the Colorado-Big Thompson project is covered in another report of the Colorado Water Conservation Board. The power report was prepared under the direction of Royce J. Tipton, Consulting Engineer.

An appraisal of present agricultural production and of future production goals in the area to be served by the Colorado-Big Thompson project is attached hereto. The accompanying report pertains specifically to the Northern Colorado Water Conservancy District which includes most of the irrigated lands in Boulder, Larimer, Weld, Morgan, Washington, Logan and Sedgwick Counties in Northern Colorado. The report was prepared in

-B-

the office of the Colorado Water Conservation Board by E. Herbert Dyer, Agricultural Economist and Robert Barkley, Senior Hydraulic Engineer. The study relates particularly to agricultural production in the district previously described and to the possibilities of adapting the agriculture of that area to changes in crop production required under the national "food for defense" program.

A handwritten signature in cursive script, reading "Clifford H. Stone".

Clifford H. Stone, Director
Colorado Water Conservation Board

ACKNOWLEDGEMENTS

Acknowledgement is made for the use of unpublished data furnished by the Division of Agricultural Statistics in the U.S.D.A. Agricultural Marketing Service; for the use of a report on "Colorado Farm Defense Program" prepared by the U.S.D.A. State Defense Board in cooperation with the U.S.D.A. County Defense Boards of Colorado; and for the use of data pertinent to sugar beet growing and sugar refining furnished by the Great Western Sugar Company.

Suggestions and constructive comments were made by Mr. F. W. Beier, Jr., Livestock Statistician of the Agricultural Marketing Service, U.S.D.A.; Mr. James C. Foster of the Bureau of Agricultural Economics, U.S.D.A.; and Mr. N. R. McCreery, District Manager of the Great Western Sugar Company.

The use of published data from various sources is acknowledged in the body of the report.

In addition to changes from the basic crop to field crop, sugar beet production is being placed upon increased yields per acre. In an irrigated

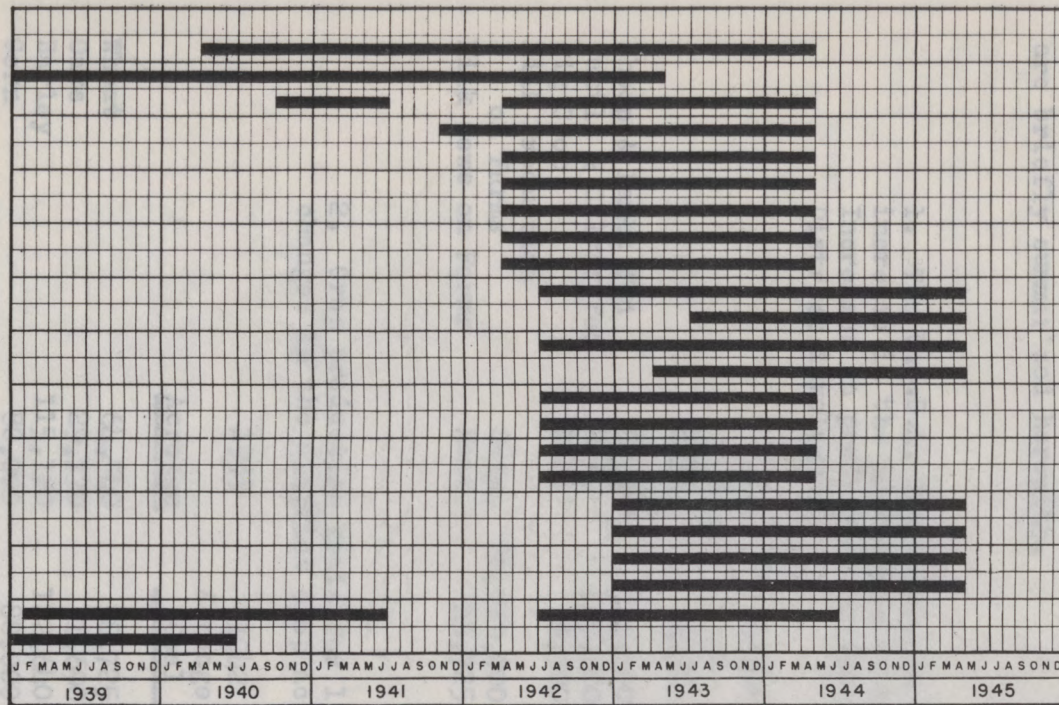
SUMMARY

Under existing war conditions and defense needs, "food for defense" has become of primary concern not only to the national farm program of the U. S. Department of Agriculture but to those agricultural sections of the United States where changes in farm economy will involve a switch from such basic crops as wheat, corn, cotton and tobacco to production of foodstuffs including meats, dairy products, vegetables and fruits. In some sections of the country these changes will necessitate major disruption in present agricultural practice. For example in the cotton and tobacco raising areas, producers face a change to farm practice and production with which they are largely unfamiliar. In making these radical changes time will be required in adapting such areas to new crops and new production methods and the Department of Agriculture does not anticipate that such areas will be able, for some time at least, to produce foodstuffs in excess of local needs.

However, in some irrigated areas of the West where agricultural production is highly diversified, the changes required will not demand such major disruptions nor require undue time for adjustment because of the familiarity of producers with specialized crops and the methods of producing them. It is from these areas that excess food products for shipment must be produced. In this respect the area composing the Northern Colorado Water Conservancy District is sufficiently diversified that producers may readily and quickly adapt themselves to changes required by the "food for defense" program.

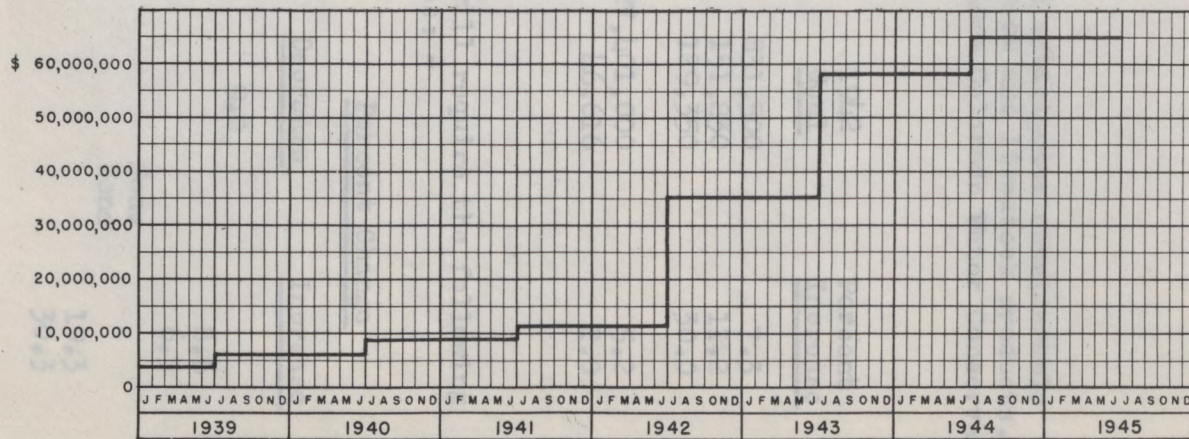
In addition to changes from the basic crops to needed food crops, emphasis is being placed upon increased yields per acre. In any irrigated

area the maintenance of high yields and the stabilization of harvested acreage is dependent upon an adequate and well regulated water supply. Under present conditions the water supplies available to the Northern Colorado Water Conservancy District fluctuate considerably from year to year and as a result the acreage from which crops are harvested and the yields of individual crops fluctuate likewise. Studies made by the U. S. Bureau of Reclamation indicate that the Colorado-Big Thompson project can make available a supplemental water supply averaging about 300,000 acre feet per year. At a time when increased production is being stressed for food crops and food products, the availability of such supplemental water supply assumes a place of primary importance. The attached construction schedule for the Colorado-Big Thompson project (Chart 1) shows that those irrigation features which will serve the Poudre Valley can be completed by 1944 and that all irrigation features can be finished by 1945. Mention is made of the Poudre Valley and the irrigation features designed to serve it because of the fact that approximately 60% of the supplemental water supply to be furnished by the project will be utilized in the Poudre Valley portion of the Northern Colorado Water Conservancy District. Thus a major portion of supplemental supply can be put to use at an early future date. The Colorado-Big Thompson is the only project now under construction which will supply supplemental water to Colorado areas on the eastern slope of the Rocky Mountains. Its early completion, therefore, will permit the Northern Colorado area to assume a burden of agricultural production which cannot be assumed by other Eastern Colorado areas which have no immediate possibility of receiving supplemental supplies.



SUGGESTED CONSTRUCTION SCHEDULE

- Continental Divide Tunnel
- Green Mountain Dam and Power Plant
- Shadow Mountain Dam
- Granby Dam
- Granby Pumping Plant and Canal
- Power Canal No. 1 and No. 1A
- Power Plant No. 1 and No. 1A
- Power Canal No. 2
- Power Plant No. 2
- Power Canal No. 3
- Power Plant No. 3
- Power Canal No. 4
- Power Plant No. 4
- Power Plant No. 4A
- Horsetooth Dam
- Horsetooth Supply Canal
- Poudre Supply Canal
- Carter Lake Dam
- Carter Lake Supply Canal
- Arkins Res. or Equiv. East Slope Storage
- Arkins Reservoir Inlet Canal
- Transmission lines and Sub. Sta.
- Roads, Buildings, etc.



REQUIRED FUNDS FOR SUGGESTED CONSTRUCTION SCHEDULE

COLORADO WATER CONSERVATION BOARD
 CLIFFORD H. STONE, Director C. L. PATTERSON, Chief Engineer
 R. J. TIPTON, Consulting Engineer

COLORADO - BIG THOMPSON PROJECT
**SUGGESTED
 CONSTRUCTION SCHEDULE**
POWER AND IRRIGATION FEATURES

December 1941

The national production of food and livestock products has been allocated by the Department of Agriculture to the several states and the U.S.D.A. State Defense Boards have subsequently established production goals for 1942. These goals have been set up by counties and it is, therefore, possible to appraise required changes as they affect the area comprising the Northern Colorado Water Conservancy District.

The production goals of the District, the changes required to meet them and the important factors which will affect their attainments are briefly summarized herewith.

1. The U.S.D.A. State Defense Board anticipates considerable increase in the production of livestock and livestock products. Increases in production in the Northern Colorado Water Conservancy District involve: -

	<u>Unit</u>	1940* or <u>1939</u>	1942 <u>Goal</u>	<u>Percent Increase</u>
Sheep & Lambs fed	Head	775,000*	831,500	7.3
Cattle & Calves fed	Head	136,000*	151,230	11.2
Pig Crop	Head	99,500	129,350	30.0
Milk Production on Farms	Gals.	26,039,000	27,401,000	5.2
Milk Cows on Farms	Head	45,725	46,616	2.0

2. Crop production goals for 1942 will require the following changes in the district crop acreages: -

	<u>1939 Acreage</u>	<u>1942 Acreage Goal</u>	<u>Percent Change</u>	
			<u>Decrease</u>	<u>Increase</u>
Wheat	64,540	58,725	9.0	
Oats	29,170	31,690		8.6
Barley	115,120	122,640		6.5
Corn	80,000	80,000	None	
Dry Beans	57,700	57,700	None	
Potatoes	24,215	28,880		19.3
Sugar Beets	102,804	134,000		30.3

Table Continued

	1939	1942	<u>Percent Change</u>	
	<u>Acreage</u>	<u>Acreage Goal</u>	<u>Decrease</u>	<u>Increase</u>
Alfalfa and other tame hay	188,800	188,800	None	
Native Hay	38,900	38,900	None	
Tomatoes (Fresh)	730	730	None	
Tomatoes (For processing)	330	365		11.0
Green Peas (Fresh)	75	75	None	
Green Peas (For processing)	2,850	3,440		20.7
Snap Beans	1,730	1,740		1.0
Cabbage	2,035	2,330		11.5
Onions	860	1,030		12.0
Miscellaneous truck crops	1,185	1,190		0.3
Fruit crops	<u>5,051</u>	<u>5,051</u>	None	
Total	716,095	757,286		5.8

3. Attainment of the 1942 goals for all crops in the Northern Colorado Water Conservancy District will necessitate the harvest of crops from an acreage approximately 6% greater than that harvested in 1939 and about 5% greater than the average acreage harvested during the period 1929-1938.

4. No increase is anticipated in the 1942 acreage of feed crops other than oats, barley and sugar beets -- the latter furnishing by-products for feeding purposes. Without an increase in acreage of corn and hay crops it appears that the increased production needed for feeding purposes must come from (1) increased yields (largely dependent upon available water supplies), or (2) shipment of feed into the areas.

Increased production of feed crops within the area may come from increasing per acre yields by supplying all supplemental water to the present acreage or by spreading supplemental water supplies over a greater acreage without anticipating any increase in yields per acre. Raising the level of feed crop production by either method or by a combination of the two will necessitate an increase in the average water supply available in view of anticipated increases in the production of other crops.

The 1939 census shows 1,073,000 acres of irrigable land in enterprises for the counties comprising the Northern Colorado Water Conservancy District. Thus it is obvious that sufficient land is available for an expansion of feed crop acreages. However, the extent of such expansion must remain dependent upon the water supply available for irrigation. It is not anticipated that water supply to be made available by the Colorado-Big Thompson project will be used for either new lands or for the entire acreage of irrigable land in enterprises. Rather it is contemplated that all supplemental supply will be utilized to increase production by making possible the harvest of crops from a larger portion of land now irrigated and by some increase in yields of individual crops.

5. It is possible that the United States may face a shortage of sugar by 1943. The South Platte Valley produced an average of 237,783 tons annually during the period 1929-1940. This amounts to 15 percent of the basic domestic allotment assigned to domestic beet sugar producers under the 1937 Sugar Act as amended.

The U.S.D.A. State Defense Board made no estimate of the acreage increase for sugar beets and only said the acreage would not be limited for the coming season. As an estimate of the 1942 harvested beet acreage for the district, the 1929-1938 average of 134,000 acres is used which amounts to an increase of 30 percent over the 1939 acreage. Officials of the Great Western Sugar Company state that in some areas of the South Platte Valley the increase in sugar beet acreage will be as much as 50 percent and the average increase would probably be between 30 and 40 percent.

It is believed that the 134,000 acres of sugar beets estimated for harvest in 1942 is conservative, although it will be necessary to have an above average water supply if all crops are grown to meet the 1942 production goals. A below average water supply for 1942 would mean curtailed production of either sugar beets, other crops, or both.

6. Of more importance than the attainment of goals established for the single year 1942, is the necessity for a stabilized and sustained production at a level at least equal to, and probably greater than, the 1942 requirement.

The greater limiting factor to a sustained high production level is the annually available water supply. During the period 1929-1938 the original water supply available to the Northern Colorado Water Conservancy District averaged 720,000 acre-feet annually, the use of which (including re-use of return flows) permitted irrigation of and harvest from an average of 725,487

acres. The relation between annually irrigated acreage harvested and the original water supply available each year from 1929 through 1938 is shown on the attached Graph I. Values were plotted for individual years and for pairs of years. The average of pairs was included to equalize the factor of carry-over surface and ground storage from one year to the next.

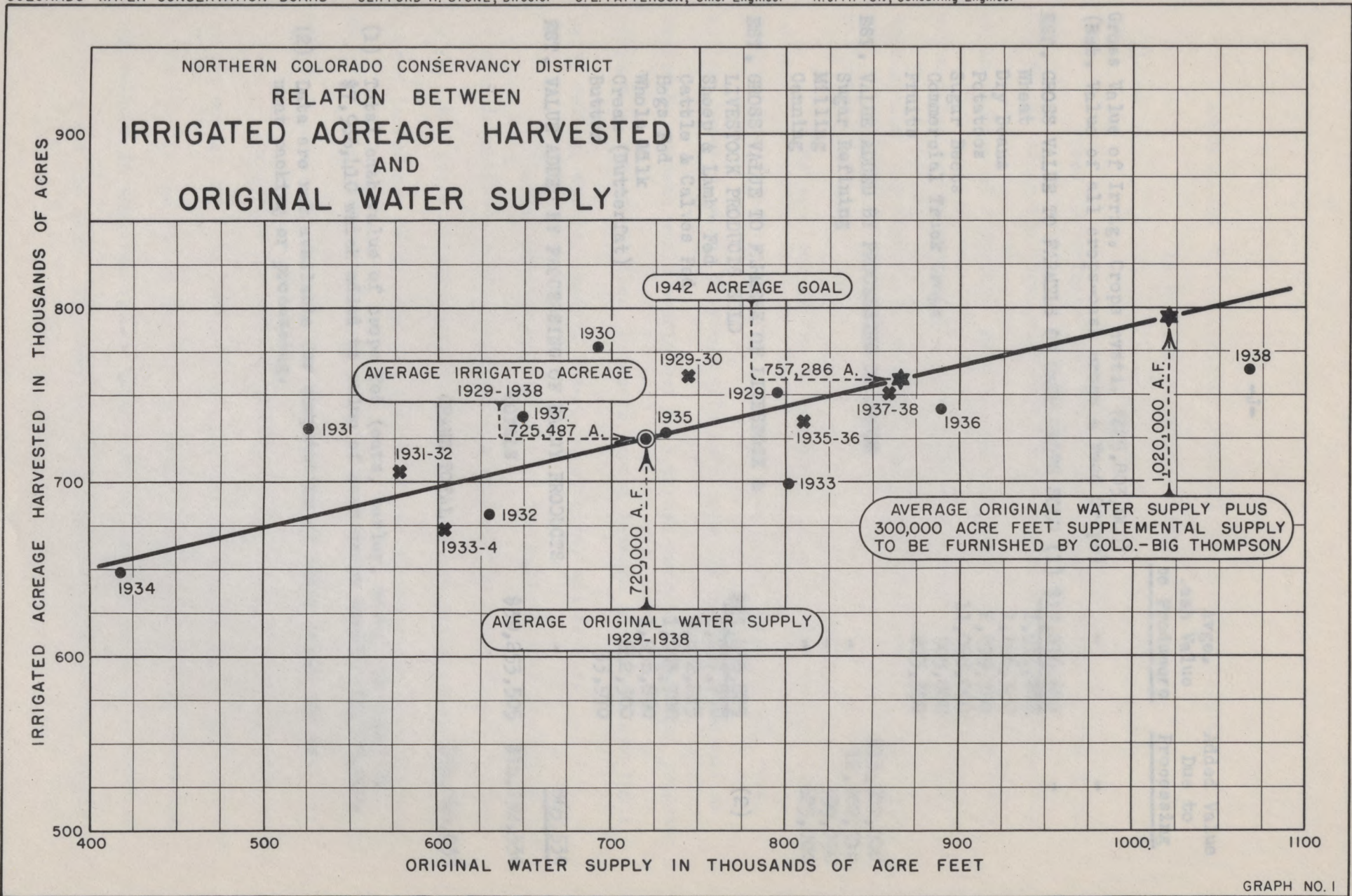
It should be stated that the relation shown is obtained on the assumption that harvested acreage is a direct indication of production in any given year and is governed by the availability of water supply during that year. Obviously a variation in yield per acre of individual crops affects the total of production, but since water supplies are usually largely concentrated on the acreage harvested, the relation between that acreage and total water supply remains sufficiently direct to be indicative.

Under future conditions of possible supplemented original supply, the relation might be changed to some extent through the stabilization of return flows at a level higher than the past average, but the effect would probably not be material. Hence the relation shown by Graph I is conservative to the extent of this presently indeterminate factor.

Also shown on Graph I are the 1942 acreage goal and the probable average water supply after completion of the Colorado-Big Thompson project. These two points plotted on the line of relations illustrate, respectively, (1) the need of supplemental water supply for the maintenance of harvested acreages at a high level and (2) the extent to which that level might rise upon provision of 300,000 acre-feet annually through completion of the Colorado-Big Thompson project.

7. If a stable and sustained production at the level of 1942 goals is to be maintained and if future goals call for further acreage increases, the development and utilization of supplemental water supply will be imperative.

8. This study makes it possible to estimate the average annual gross value of agricultural products (crops, livestock, livestock products) sold for cash by farmers in the Northern Colorado area and the added value due to processing and manufacturing of such products. However, the \$54,046,035 does not represent the total gross value since the added value of livestock due to meat packing or processing is not included because of insufficient information available. This would be the only major item not included, but it could be said conservatively that the total gross value for the area would exceed \$60,000,000 if this item were included.



	Avge. Cash Value to Producers	Added Value Due to Processing
Gross Value of Irrig. Crops hvstd. (\$25,803,000) (Est. Value of all crops-cash crops & Feed Crops)	-	-
EST. GROSS VALUE TO FARMERS OF CASH CROPS SOLD (1)	\$17,816,680	-
Wheat	1,511,700	
Dry Beans	1,146,350	
Potatoes	2,879,350	
Sugar Beets	11,098,090	
Commercial Truck Crops	905,800	
Fruits	275,390	
EST. VALUE ADDED BY PROCESSING OF CROPS		\$13,927,000
Sugar Refining	-	12,902,910
Milling	-	399,090
Canning	-	625,000
EST. GROSS VALUE TO FARMERS OF LIVESTOCK & LIVESTOCK PRODUCTS SOLD	\$21,436,825	(2)
Sheep & Lamb Fed	8,237,750	
Cattle & Calves Fed	9,472,215	
Hogs Fed	1,093,700	
Whole Milk	1,956,890	
Cream (Butterfat)	642,300	
Butter	33,970	
EST. VALUE ADDED BY PROCESSING OF DAIRY PRODUCTS	-	865,530
TOTALS	\$39,253,505	\$14,792,530
GRAND TOTAL		\$54,046,035

(1) Total cash value of crops fed (oats, barley, corn, all hays) is \$7,986,410 which added to value of cash crops equals \$25,803,000.

(2) Data are not available for computation of added value due to meat packing or processing.

AGRICULTURE IN THE NORTHERN COLORADO CONSERVANCY DISTRICT

AS RELATED TO NATIONAL DEFENSE

"Food for defense" has become the primary concern of the U. S. Department of Agriculture, completely reversing former policies based upon an economy of scarcity. Many are saying today that food will win the war and decide the peace. The goal appears to be more production, more consumption, and higher standards of living - - - both national and international.

Some sections of the United States face drastic changes in their present farm economy, involving a switch from basic crops (wheat, corn, cotton, tobacco, rice) to foodstuffs more urgently needed. Disruptions caused by present world conditions have thrown current production programs completely out of balance. Products needed involve dairy products (milk, eggs, butter, cheese,) meats, sugar, vegetables, and fruits.

Into this picture must be fitted the agricultural production and related industries in the irrigated sections of the South Platte in Colorado. This report is presented to show how present practices may be adjusted to defense needs, and the possibilities of increased production by means of supplemental water supplies to be made available upon completion of the Colorado-Big Thompson project.

Irrigation has made it possible for the South Platte Valley to become one of the most intensively farmed areas in the West. Agricultural production in the Valley and the industries related to and dependent upon agriculture in the area form a vital part of the agricultural economy of Colorado and the West. Fluctuations in annually available water supply

are responsible for wide variations in the production of crops grown in the Valley. Supplemental water supplies which can be made available by completion of the Colorado-Big Thompson Project are of primary importance as an aid to the stabilization of agricultural production at a level above the present average and at a level now obtainable in only the most favorable of water supply years. During the few years on record when water supply was ample, the resulting value of agricultural production in Northern Colorado demonstrates the value which may accrue as a result of supplementing present water supply.

The following portions of this report serve to show the extent and value of irrigated agriculture in that portion of the South Platte Valley embraced by the Northern Colorado Conservancy District. In presenting the data which follow, an attempt is made to show the adaptability of the area to changes required by war conditions. Changes made to fit a "production for consumption" program will be partially dependent upon the extent to which supplemental water can be furnished for increasing production of those food products required in the interest of the national war effort. Without supplemental water supply, it is doubtful that the 1942 goals set up under the farm defense program can be reached unless water supply conditions are very favorable. It is entirely probable that conditions will necessitate even higher farm defense goals in subsequent years. In order to reach and then maintain a level of production compatible with defense requirements a supplemented and regulated water supply will be imperative.

IRRIGATED ACREAGE FROM WHICH CROPS ARE HARVESTED

The Northern Colorado Conservancy District comprises about 70 percent of the total harvested acreage from irrigated lands in the South

Platte Valley in Colorado. An average of 725,487 acres were harvested under irrigation during the 10-year period 1929-1938, which figure represents county totals of all counties included in the district. Although there are some irrigated lands in these counties lying outside of the district boundaries, the majority are included in the district to be served by the Colorado-Big Thompson development.

Need of supplemental water supplies to increase and stabilize crop production is indicated by the following data. State average prices for the period 1923-1938 were used in order that crop values would serve as an index to production. Thus, it is possible to show the relationship between crop production and original water supplies.

TABLE I

<u>Year</u>	<u>Crops Harvested from Irrig. Lands</u>		<u>Original Water Supply (1)</u>
	<u>Acres</u>	<u>Value</u>	
1929	750,725	\$27,415,000	795,000
1930	772,133	32,962,000	692,000
1931	730,781	25,861,000	525,000
1932	680,766	19,779,000	630,000
1933	698,526	25,565,000	801,000
1934	648,406	18,339,000	417,000
1935	728,106	25,217,000	731,000
1936	741,998	27,675,000	889,000
1937	738,170	26,638,000	649,000
1938	<u>765,251</u>	<u>28,473,000</u>	<u>1,067,000</u>
AVGE.	725,487	\$25,803,000	720,000

Value of irrigated crops harvested has varied from \$18,339,000 in 1934 to \$32,962,000 in 1930. It should be noted that in 1930 and 1932 crop values appear somewhat out of line in respect to original water supplies reported for that year. However, in order to make a detailed comparison by individual years, consideration would have to be given

(1) Official Records of the State Engineer's Office.

to such factors as carry-over water storage, shifts in acreage from low to high value crops, livestock feed reserves and other such factors as influence crop values in any given year.

Tables showing crop acreages and values for the counties by type of crop and by years are included in the Appendix.

PRODUCTION GOALS - 1942

Colorado production goals for 1942 for those agricultural products considered to be essential to the national farm defense goal are taken from the report "Colorado Farm Defense Program - 1942" as prepared by the U.S.D.A. Defense Board of Colorado (See Appendix, Table I). A brief explanation as to how state and national goals have been set up is offered in the following quotation from the above report:

"The Department of Agriculture has developed information that establishes the amounts of livestock products and acreages of crops which will be needed by the United States in 1942. These goals are based upon:

1. "Needs of Americans for an adequate standard of living.
2. "Probable markets for agricultural products in 1942.
3. "Probable demands for foodstuffs by nations America is assisting in resisting aggression.

"The national production of these products has been allocated to the several states after study of the regional adjustments that have been made and should continue being made in agriculture."

Cropped Acreage Goals

County goals, which make up the State totals, were estimated by the State and County defense boards on the basis of the probable percentage increase over or decrease from the acreage planted in 1941 to

specific crops. A summary of these percentage increases for the counties comprising the Northern Colorado Conservancy District are shown in Table 2.

TABLE 2

Percent of Increase over 1941 Crop Acreage Planted
Counties in Northern Colorado Conservancy District

<u>Crops</u>	<u>Boulder</u>	<u>Larimer</u>	<u>Weld</u>	<u>Morgan</u>	<u>Logan</u>	<u>Sedgwick</u>
Oats	6	0	15	8	5	25
Barley	5	0	10	8	0	25
Potatoes	0	0	30	15	5	13
Vegetable Crops for Processing						
Green Peas	25	25	10	0	0	0
Snap Beans	10	0	0	0	0	0
Tomatoes	10	0	10	0	0	0
Vegetable Crops for Shipment						
Cabbage	10	10	15	0	5	0
Onions	10	10	20	0	20	0
Other Truck Crops	1	1	0	0	0	0
<u>Number of Farm Gardens</u>						
Total Farms (1939 Census) with and without farm gardens	1352	1825	4512	1349	1575	505
1942 Goal (Farm Gardens)	975	1315	3250	975	1135	365

Since 1941 crop acreage figures can only be estimated at this time, a comparison is made between 1939 acreages (latest published figures available) and the 1942 goals. Only preliminary figures for 1941 were used by the State Defense Board in figuring production goals. It is believed that the 1939 harvested acreages would be as reliable an area upon which to base 1942 production goals as the preliminary estimated acreages for 1941. Changes recommended by the U.S.D.A. State Defense

Board would affect the Northern Colorado Conservancy District as shown in Table 3.

TABLE 3

Farm Defense Goals for 1942

(Acreages Recommended by U.S.D.A. State Defense Board)

	<u>Crop Acreage in Northern Colorado Conservancy District</u>			<u>Percent Change from 1939 to 1942</u>	
	<u>1929-1938 Average</u>	<u>1939</u>	<u>1942 Goal</u>	<u>Decrease</u>	<u>Increase</u>
<u>Early Season Annuals</u>	<u>194,709</u>	<u>208,830</u>	<u>213,055</u>		
Wheat	69,749	64,540	58,725	9.0	
Oats	28,590	29,170	31,690		8.6
Barley	96,370	115,120	122,640		6.5
<u>Late Season Annuals</u>	<u>262,112</u>	<u>264,719</u>	<u>300,580</u>		
Corn	70,851	80,000	80,000		None
Dry Beans	31,835	57,700	57,700		None
Potatoes	25,107	24,215	28,880		19.3
Sugar Beets	134,319	102,804	134,000 (1)		30.3
<u>Forage Crops</u>	<u>240,358</u>	<u>227,700</u>	<u>227,700</u>		
Alfalfa & Other					
Tame	205,972	188,800	188,800		None
Native Hay	48,627	38,900	38,900		None
<u>Commercial Truck Crops</u>	<u>8,955</u>	<u>9,795</u>	<u>10,900</u>		
Tomatoes (Fresh)	370	730	730		None
Tomatoes (For Processing)	552	330	365		11.0
Green Peas (Fresh)	36	75	75		None
Green Peas (For Processing)	3,061	2,850	3,440		20.7
Snap Beans	1,300	1,730	1,740		1.0
Cabbage	2,025	2,035	2,330		11.5
Onions	464	860	1,030		12.0
Miscellaneous	1,147	1,185	1,190		0.3
<u>Fruit Crops</u>	<u>5,112</u>	<u>5,051</u>	<u>5,051</u>		None
Total	725,487	716,095	757,286		5.8

(1) No specific sugar beet acreage was shown by U.S.D.A. Defense Board, average beet acreage 1929-1938 is substituted. Acreages not restricted 1929-1933; restricted 1934-1938.

It may be noted from Table 3 that some rather substantial increases are anticipated in production of crops for food. These increases in the acreage to be utilized for food production are largely offset by a decrease in wheat acreage. Attainment of the 1942 goals for all crops in the Northern Colorado Conservancy District will necessitate harvest from an acreage 6 percent greater than that served in 1939 and 4.5 percent greater than the average acreage harvested during the period 1929-1938.

In addition to recommending the crop acreage increases as shown the U.S.D.A. Defense Board has recommended substantial increases in the production of hogs, beef cattle and calves, sheep and lambs and some increase in dairy stock and dairy products. The scope of these recommendations are given in more detail following this discussion of cropped acreage goals. It might be mentioned here, however, that some adjustments of crop acreage goals may be necessary to meet the feed requirement demanded by the increase in livestock feeding and dairying. The increased acreage assigned to sugar beets would, of course, be responsible for the furnishing of additional beet industry by-products used in feeding operations. However, no increase is anticipated in acreage of alfalfa or feed crops other than oats and barley. Consequently some shift in acreage goals from one crop to another or a direct expansion of feed crop acreage might possibly be required. There is sufficient land under the constructed ditches of the area to permit considerable acreage expansion, but the greatest limiting factor to such expansion is available water supply. If a stable and continued production at the level of 1942 goals is to be maintained and if future goals call for further acreage increases, the development and utilization of supplemental water supply will be a necessity.

UNITED STATES MAY FACE SHORTAGES OF SUGAR BY 1943

Sugar will be one of the larger items of food needed in our war effort. It will be needed for domestic consumption, our own military force, and for Lease-lend export to our Allies. Past policies have left us unprepared to produce within the United States even 50 percent of the sugar required for domestic consumption. While forthcoming supplies and present surpluses are believed sufficient for the year 1942, because of war conditions we are likely to face shortages of offshore sugar due to transport difficulties. Resultant shortages in sugar supplies are apt to be encountered by 1943.

The Sugar Act of 1937 as amended shows the basic estimate of consumptive requirements to be 6,682,856 tons. Under authority of the Act the basic domestic allotment is about 55 percent of estimated consumption, but not to be less than 3,715,000 tons with the remainder of requirements to come from the Philippines, Cuba, and foreign countries other than Cuba. The basic domestic allotment is divided as follows:

<u>Area</u>	<u>Short Tons</u>	<u>Percent</u>
Domestic Beet Sugar	1,549,898	41.7
Mainland Cane Sugar	420,167	11.3
Hawaii	938,037	25.3
Puerto Rico	797,982	21.5
Virgin Islands	8,916	.2
Total	3,715,000	100.0

It may be noted that only 1,970,065 tons or 30 percent of the estimated consumptive requirements are to be produced within the United States.

The revised quotas of August 29, 1941 show that 2,675,037 tons, or 30 percent of the total amount needed will come from continental beet

and mainland cane growers while 6,327,739 tons, or 70 percent, must come from Hawaii, Puerto Rico, Virgin Islands, Philippines, Cuba, and foreign countries other than Cuba.

The importance of the beet sugar industry in the South Platte Valley, aside from the value of by-products for livestock feeding, is portrayed by the fact that an average of 237,783 tons of sugar was refined annually during the period 1929-1940 according to officials of the Great Western Sugar Company. This would amount to 15 percent of the basic domestic allotment assigned to domestic beet sugar producers under the 1937 Act. The importance of the district may be further illustrated by the fact that the average annual amount of sugar produced in the area is 27 percent of the average annual amount (889,681 tons) imported from Hawaii during the period 1931-1940.

The U.S.D.A. State Defense Board made no estimate of the acreage increase for sugar beets. Included in their report is the following quotation from the statement issued by the Department of Agriculture on "General Plan of Campaign for Farm Defense Program - 1942":

"The current supply situation with respect to sugar indicates that the sugar cane and sugar beet acreages in this country and the insular areas need not be limited for the coming season."

As an estimate of 1942 beet acreage for the Northern Colorado Water Conservancy District the 1929-1938 average is used in Table 3, and the increase over 1939 acreage would thus amount to 30 percent.

Since there are to be no limitations upon the acreage to be planted in 1942, a 30 percent increase in sugar beet production is believed justified upon reviewing past history of sugar beet production in the district. Data furnished by the Great Western Sugar Company for

the period 1934-1940 when Government restrictions were in effect show that the average acreage harvested was 114,320 acres. For the period 1920-1933 inclusive when there were no restrictions there was harvested annually an average of 140,300 acres.

It is believed that the 134,000 acres of sugar beets estimated for the 1942 goal is conservative, although it will be necessary to have an above average water supply if all crops are grown to meet the 1942 production goal as set up in Table 3. (See Graph 1) A below average water supply for 1942 would mean curtailed production of either sugar beets, other crops, or both.

Perhaps one other point should be mentioned in regard to the increased production of sugar beets. Since the 1937 Act, the harvested acreage of sugar beets in the Northern Colorado Water Conservancy District for the years 1938-1940 has averaged 106,028 acres which would equal an estimated 190,242 tons of sugar. This amounts to 12.27 percent of the basic consumptive requirements assigned to all continental beet sugar producers under the 1937 Act. If continental beet sugar producers are expected to produce the 2,230,037 tons set up under the revised quota of August 29, 1941, and since curtailment of restrictions upon planted acreages to sugar beets has already been lifted due to war conditions, the Northern Colorado district might be expected to produce their portion of the total amount assigned to domestic beet sugar producers in line with the amount produced under past restrictions. Under such conditions this would amount to 12.27 percent of 2,230,037 tons or 273,625 tons to be produced by the district. Thus the production of 273,625 tons would necessitate an estimated harvested acreage of 147,706 acres.

In the summary portion of this report reference is made to the construction schedule of the Colorado-Big Thompson project which shows that approximately 60 percent of the irrigation water may be supplied to the district by 1944 and all irrigation features of the project completed by 1945. Obviously if high production levels are to be reached as quickly as possible and maintained thereafter it will be necessary that supplemental water supply be furnished by the Colorado-Big Thompson project.

Production Goals of Livestock and Livestock Products

Colorado production goals for livestock and livestock products, as quoted from the report "Colorado Farm Defense Program - 1942" as prepared by the U.S.D.A. Defense Board for Colorado, are:

"Milk production goal in 1942, 1,183 million pounds, an increase over 1940 of 9 percent, or an increase over the indicated production for 1941 of 4 percent. The number of milk cows on farms in 1942 is expected to be 238,000 head, which is an increase of one percent over 1941.

"Egg production goal in 1942, should be 32,266,000 dozen, which is an increase of 11 percent over 1941.

"Beef cattle and calves marketing goal (live weight) is expected to be 609,928,000 pounds, an increase of 18 percent over 1940.

"Hog marketing goal (live weight) is 95,985,000 pounds for 1942, which is a decrease in the total pounds marketed as compared with the marketings in 1940, but which will require saving 27 percent more of the 1941 fall pig crop than was saved in the fall of 1940, and 30 percent more of the 1942 spring pig crop than was saved in the spring of 1941.

"Sheep and Lamb production goal for 1942 is 121,000,000 pounds (live weight), an increase of 9 percent over 1940."

Suggested county goals for 1942, shown only for the principal counties included in the Northern Colorado Conservancy District, are shown

in Table 4. These goals were developed by the U.S.D.A. State Defense Board after consideration with the U.S.D.A. County Defense Boards.

TABLE 4

<u>Livestock and Livestock Products</u>	<u>Boulder</u>	<u>Lari-mer</u>	<u>Weld</u>	<u>Morgan</u>	<u>Logan</u>	<u>Sedg-wick</u>
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Percent Increase over 1941

Milk Production on Farms	6	6	5	4	4	8
Milk Cows on Farms	2	5	1	1	2	3
Egg Production on Farms	10	10	10	15	10	10
Hogs-1942 Spring Pig Crop	30	30	30	30	30	30

Percent Increase over 1940

Beef & Veal Marketing and Farm Slaughter	15	10	10	15	10	15
Sheep and Lambs	10	5	10	5	5	5

As previously noted the State Defense Board anticipated considerable increase in the production of livestock and livestock products, but no increase in feed crops other than oats, barley, and sugar beets - the latter furnishing by-products for feeding purposes. In view of the proposed increases of livestock and livestock products, it would seem essential that feed crop production be increased accordingly. Since no increase in acreage for alfalfa, other tame hays, and corn are established in the crop production goals set up by the defense boards, it must be assumed that any increase in feed crops must come from either increased yields or else feed supplies will have to be shipped into the area to meet feeding requirements demanded by increased production of livestock and livestock products.

Shipment of feed crops into the area from outside sources appears impractical. Consequently it remains that a greater amount of feed should be produced within the area if a higher level of livestock feeding is to

be maintained.

As was pointed out in the discussion of crop production goals set up by the defense boards, supplemental water supplies appear to be the limiting factor in maintenance of the higher crop production level anticipated. Further necessity of an increased water supply also appears obvious if feed crops are to be produced within the area to meet the increased feeding requirements.

LIVESTOCK FEEDING

Data concerning livestock feeding in Northern Colorado are herewith presented to show the extent of feeding operations and to permit evaluating present production within the area in terms of the defense goals set up for the area.

Lamb Feeding

Lamb feeding in Northern Colorado is of primary importance as shown by the fact that an average of 993,900 head (Table 5) as of January 1st are fattened annually, based upon estimates made by the Agricultural Marketing Service, U.S.D.A., for the period 1923 to 1940.

The accompanying table shows that the number fed has declined somewhat during the past 10 years. An average of 1,130,000 were fattened for the period 1923 to 1930, but this average declined to about 885,000 for the 1931 to 1940 period.

Colorado leads the nation as a producer of fat lambs, and during the period 1923 to 1940 fattened annually about 20 percent of the total number fattened in the United States. The decline in the number fed in Colorado during the last 10 years is reflected in the percentage of total number fed in the United States. Colorado fed an average of about

25 percent of the nation's total for the 1923-1930 period compared to about 16 percent for the 1931-1940 period. Northern Colorado feeds nearly 75 percent of the total number fattened in Colorado. The following quotation is descriptive of lamb feeding conditions in the area.

"The Northern Colorado section is advantageously located as related to the source of feeder lambs. Feeders can be obtained directly from ranges in Colorado and other western sheep states, or from the Denver stockyards, which is the largest sheep and lamb market in the country. This market also provides adequate facilities for marketing the finished product The lamb feeding industry is a natural complement of the beet sugar industry. Feeding of these animals is the most advantageous means of utilizing the beet tops and beet pulp, by-products of the growing and manufacture of sugar beets Locally raised feed grains and alfalfa provide most of the additional grain and hay needed for a balanced fattening ration." (1)

TABLE 5

Sheep and Lambs on Feed in Northern Colorado
(Estimated Number and Value January 1)

<u>Year</u>	<u>Number in Northern Colo.</u>	<u>Percent of Total in Colo.</u>	<u>Percent of Total in U.S.</u>
1923	1,175,000	78	27
24	1,150,000	82	27
1925	1,250,000	78	31
26	1,090,000	74	23
27	520,000	68	12
28	1,265,000	80	28
29	1,100,000	72	23
1930	1,430,000	73	25
31	975,000	63	18
32	1,100,000	69	18
33	955,000	68	17
34	835,000	67	16
1935	840,000	77	15
36	980,000	78	17
37	750,000	73	14
38	880,000	74	15
39	805,000	73	14
1940	<u>730,000</u>	<u>79</u>	<u>12</u>
Avge.	933,900	74	19

(1) "Colorado Agricultural Statistics - 1939", statement by F. K. Reed, U.S.D.A. Division of Agricultural Statistics.

Table 5A includes the estimated number fed as of January 1st shown in Table 5, and in addition an estimate of others fed during the year. Estimates regarding the latter item and those pertaining to values are computed from unpublished records supplied by the Marketing Service of U. S. D. A.

TABLE 5A

Estimated Number and Value of Sheep and Lambs fed in Northern Colorado

Year	No. on Feed	Others Fed	Total	Market Value	
	January 1st	During Year	Number Fed	Per Head	Total
1929	1,100,000	80,000	1,180,000	\$14.70	\$17,346,000
30	1,490,000	20,000	1,510,000	9.15	13,816,500
31	975,000	60,000	1,035,000	7.35	7,607,250
32	1,100,000	19,000	1,119,000	5.40	6,042,600
33	955,000	20,000	975,000	4.60	4,485,000
34	835,000	37,000	872,000	8.05	7,019,600
1935	840,000	42,000	882,000	7.15	6,306,300
36	980,000	20,000	1,000,000	9.10	9,100,000
37	750,000	60,000	810,000	10.15	8,221,500
38	880,000	23,000	903,000	7.20	6,501,600
39	805,000	44,000	849,000	8.15	6,919,350
1940	730,000	45,000	775,000	8.65	6,703,750
Avg.	953,330	39,170	992,500	8.30	8,237,750

The above estimates include some lambs on wheat pastures. Feeding operations involve practically all lambs with only about 5,000 to 7,000 old ewes on feed for market.

Unit values are computed upon the basis of price of lambs at Chicago less freight. Unpublished records of the Colorado Experiment Station regarding lamb feeding in Northern Colorado show the average market weight for the period 1922-1938 to be 91.61 pounds per head which is used as a basis for computing the value per head.

Production goal for 1942 set up by the U. S. D. A. State Defense Board is an increase of 9 percent in the number of sheep and lambs for the

State with increases in the Northern Colorado counties ranging from 5 to 15 percent. The 1942 production goal for the Northern Colorado area is estimated at about 831,500 head compared to 775,000 head in 1940, an increase for the area of 7.3 percent. (See Appendix, Table IX).

Cattle Feeding

Cattle on feed in the Northern Colorado area averaged nearly 117,000 head for the period 1930-1940. Approximately 89 percent of all cattle fed in the state are produced in this area. Production goals set up for 1942 for Colorado show an 18 percent increase over 1940 with from 10 to 15 percent increases for the counties in the Northern Colorado Conservancy District. Total production in 1942 for these counties would be 151,230 head, an increase of approximately 15,230 head or 11.2 percent over 1939.

In contrast to the decline in number of sheep and lambs on feed within the area the number of cattle fed has increased considerably, especially for the years 1936-1940 inclusive.

Price of cattle at Chicago less freight were used in computing values. Unpublished records of the Marketing Service of U.S.D.A. were used in weighting the value per head upon the basis of percentage of steers, cows, and heifers shipped from the Northern Colorado area, average weights of each class, and the average price for the months when shipments are made.

TABLE 6

Estimated Number and Value of Cattle Fed in Northern Colorado

Year	January 1st	Others*	Total No. Fed	% of Total in Colo.	Market Value	
					Per Head	Total
1930	105,000	12,000	117,000	84.0	\$110.08	\$12,880,120
31	120,000	16,000	136,000	88.0	70.42	9,577,660
32	79,000	8,000	87,000	87.8	60.85	5,294,035

TABLE 6 (Cont'd.)

Year	January 1st	Others*	Total No.		Market Value	
			Fed	% of Total in Colo.	Per Head	Total
1933	65,000	10,000	75,000	86.7	\$ 50.56	\$3,791,700
34	85,000	13,000	98,000	88.5	58.53	5,735,500
1935	80,000	12,000	92,000	92.0	100.09	9,208,080
36	110,000	16,000	126,000	90.9	75.16	9,470,100
37	130,000	17,000	147,000	89.7	91.70	13,479,900
38	130,000	13,000	143,000	90.9	74.37	10,635,050
39	110,000	20,000	130,000	88.0	90.81	11,804,910
1940	120,000	16,000	136,000	88.0	90.57	12,317,310
Avg.	103,090	13,910	117,000	88.6	80.96	9,472,215

Others put on feed after January 1st for feeding and sale prior to December 31st.

Hog Production

Data concerning hog production for the Northern Colorado area are quite limited. County Assessors' records as of April 1st for the period 1931-1939 show 28,773 head on farms in the counties comprising the Northern Colorado Conservancy District. This is 21.3 percent of the State total as of April 1st. The average annual pig crop saved for the period 1924-1939 is 524,000 head for all counties in Colorado as reported by the Marketing Service of U.S.D.A. Average annual pig crop saved for this period in Northern Colorado is estimated to be 111,600 head by using 21.3 percent of the State total.

Unlike cattle and sheep, many of which are shipped into the area from nearby grazing areas in Colorado and neighboring States, most of the hogs sold by farmers are raised within the area. Consequently it may be assumed that the number of hogs fattened and sold each year offsets the average annual pig crop. Average annual farm value of hogs marketed in Colorado for the period 1924 to 1940 is \$9.80 per head. Therefore, the

average annual gross value of hogs produced in Northern Colorado, 111,600 head, is \$1,093,700.

The 1942 production goal as set up by the U.S.D.A. State Defense Board is a 30 percent increase in the spring and fall pig crop saved over 1941 for all counties in Northern Colorado. Complete data are not available concerning the 1941 inventory so 1939 is used as a basis for estimating the 1942 goal. The Marketing Service of U.S.D.A. estimated a pig crop for 1939 of 505,000 head. County Assessors' records show that counties in Northern Colorado had 21,155 head on farms as of April 1, 1939, comprising 19.7 percent of the State total. Distribution by areas within the State of the 1939 pig crop should be comparable to the distribution of all hogs assessed. Thus the Northern Colorado area would have produced 99,500 head in 1939. A 30 percent increase over the 99,500 spring and fall pig crop saved in 1939 would amount to 129,350 head as the 1942 goal.

INDUSTRIES RELATED TO AGRICULTURE

While it is impossible in this report to present definite figures as to the increased values due to processing of crops harvested in Northern Colorado, the following information does indicate the facilities that are available for processing foodstuffs designated as of primary importance for the defense program.

Of particular significance to Northern Colorado are five outstanding food industries. These are (1) meat packing, (2) sugar refining, (3) milling, (4) dairy products, and (5) canning.

Meat Packing

Most of the fattened cattle and lambs produced in Northern Colorado go directly to eastern markets although recently there has been some

shipments to western markets along the Pacific Coast. There are, of course, some fat cattle and lambs from the area sold to the Denver packing houses but information regarding the extent of such sales is not available.

The meat packing industry in Colorado, concentrated largely in Denver, is of considerable importance. The total value of goods produced by packers in Colorado in 1939 was \$33,000,000. The Northern Colorado District is of particular importance to the packing industry because of the concentration in the area of feeding lots for both sheep and cattle, and, in turn, the feed lots are directly dependent upon production in the District of beet tops, beet pulp, molasses, hay and grain.

There are 12 meat packing firms operating in Denver and one in Sterling and these plants are responsible for the employment of nearly 1000 persons.

Sugar Refining

The value of products from the sugar refining industry in Colorado is estimated to average about \$32,500,000. The sugar industry is related more closely to the Northern Colorado district than is meat packing, but the two industries are definitely related because the by-products of beet raising and sugar refining form a large part of the basic feed for feeding lots located within the District.

There are 13 sugar refining factories located in the South Platte Basin in Colorado and these are all located within or adjacent to the District at the towns of Fort Collins, Greeley, Eaton, Windsor, Loveland, Longmont, Johnstown, Brush, Ft. Morgan, Ovid, Sterling, Ft. Lupton and Brighton.

The industry, at the locations named, provides full time employ-

ment for about 650 workers and part time employment to about 3600 during the refining season.

The Northern Colorado area is responsible for 74 percent of the sugar produced in the State, based upon the sugar beet acreage reported. It may be assumed, therefore, that the Northern Colorado area accounts for an average of about \$24,000,000 of the total value of products from the sugar refining industry in Colorado. Subtracting the gross value of sugar beets to farmers (\$11,098,090 as shown in the Appendix, Table V) the added value due to processing amounts to \$12,902,910. This is in line with studies made by the Colorado Experiment Station, Bulletin 453, "Economics of Sugar Beet Production," which shows that "individual years indicate a decided tendency for the factory payment to the farmer to keep between 40 and 50 percent."

Milling Industry

The value of milled grain products in Colorado in 1939 amount to more than \$11,000,000 of which about \$2,300,000 represents the value added by manufacturing. The milling industry is of importance to the Northern Colorado Conservancy District because it is directly associated with meat packing and sugar refining through feed lot use of grain feeds and by-products from flour milling.

Available to the grain producers of the District are flour mills in Denver, Fort Collins, Longmont and Fort Morgan; and feed mills in Denver.

Value of milled grain products produced in the Northern Colorado Conservancy District is based upon the percentage of total grain produced on irrigated lands in the district in relation to the total grain produced in the State which amounts to an average of about 15.4 percent. Insufficient

data relative to the extent that barley and oats are milled are available so wheat, which comprises the greater amount of the milled grain products, was used as a basis for estimates. The value of grain added by milling amounts to 26.4 percent as shown by the above figures for the State. Therefore the increased value of wheat (\$1,511,700 to farmers as shown in Appendix, Table V) would be \$399,090 or a total of \$1,910,790 would represent the estimated value of milled grain products produced in the Northern Colorado area.

Closely related to the milling industry is the manufacture of bakery products. The baking industry receives its basic raw materials largely from the milling, sugar refining and dairy industries. It was responsible in 1939 in Colorado for manufacture of products valued at nearly \$8,500,000. Of this amount \$4,000,000 represents the value of raw material purchased from producers and \$4,500,000 represents the value added through manufacture. Bakery products are of especial importance to the Northern Colorado Conservancy District because of their close relationship to raw materials produced in the area.

Dairy Products

In 1939 the value of dairy products manufactured in Colorado exceeded \$12,000,000. Of this amount, about \$9,000,000 was paid to agricultural producers for raw materials and \$3,000,000 represents the value added by manufacturing. Butter produced made up approximately 2/3 of the entire value of these products.

The total value of milk and cream sold by farmers in the Northern Colorado area is estimated to be \$2,599,290 (See Appendix, Table X). Added value due to processing would be \$865,530 for the area.

Canning Production of malted milk by the Coors Company at Golden is responsible for an annual product value of nearly \$500,000. This industry is of special significance to Northern Colorado because of the demand for milk produced on farms north of Denver as far as Fort Collins and Greeley.

Evaporated Evaporated milk plants at Johnstown and Fort Lupton are responsible for an additional milk demand in the neighboring agricultural areas.

The manufacture of dairy products is an industry of significant value to Northern Colorado. The only available data regarding production of dairy products in this area are from U. S. Census reports. The following statistics from the 1940 Census for the calendar year 1939 show:

TABLE 7

<u>Item</u>	<u>Boulder</u>	<u>Larimer</u>	<u>Weld</u>	<u>Morgan</u>	<u>Logan</u>	<u>Sedgwick</u>	<u>Total</u>
Cows & Heifers							
Milked	6,367	6,438	19,242	4,642	6,671	2,365	45,725
Milk Production (Thousands of gals.)	4,083	3,823	11,263	2,371	3,264	1,235	26,039
Butter Churned on Farms (Thousands of lbs.)	59	93	225	71	128	43	619
<u>Products Sold</u>							
Whole Milk (Thousands of gals.)	2,946	2,133	7,042	538	278	66	13,003
Cream (Butterfat) (Thousands of lbs.)	142	221	568	317	599	225	2,072
Butter (Thousands of lbs.)	18	19	48	3	9	3	100

Value of products sold, listed in Table 7, may be estimated by using State average prices (1923-1938 period). Thus, the Northern Colorado Conservancy District in 1939 produced whole milk sold valued at \$1,957,000 or 40 percent of the State total; cream sold valued at \$642,000 or 17 percent of the State total; and butter sold from farms valued at \$34,000 or 26 percent of the State total. (See Appendix, Table X).

Canning Industry

Canned fruit and vegetables provide a major export from Northern Colorado, and the annual value of produce canned in the area exceeds \$1,250,000. The most important products canned are beans, peas, tomatoes, tomato products, corn, beets, kraut, carrots, pickles, lima beans, hominy, and cherries.

Canning factories handling vegetables are located at Brighton, Ft. Lupton, Loveland, Greeley, and Longmont. Cherry and cherry product canneries are located in Loveland and Ft. Collins.

A P P E N D I X

SUGGESTED GOALS IN 1942 FOR PRINCIPAL CROPS
FOR COLORADO

Source: "Colorado Farm Defense Program 1942," prepared by U.S.D.A. State Defense in cooperation with U.S.D.A. County Defense Boards

Crop	Suggested	Estimated Acreage	
	Acreage 1942	1941	1939
Wheat	1,185,000(a)	1,504,000	1,625,000
Oats	190,000	180,000	175,000
Barley	650,000	638,000	658,000
Rye	46,000	60,000	46,000
Corn	1,022,000	1,022,000	1,064,000
Dry Beans	332,000	332,000	430,000
Potatoes	87,000	77,000	97,000
Grain Sorghums	450,000	455,000	456,000
All Hay	1,404,000	1,404,000	1,381,000
Commercial Truck Crops for Fresh Consumption	64,000	63,340	56,200
Tomatoes	2,500	2,500	2,400
Snap Beans	2,700	2,700	2,700
Green Peas	23,000	20,300	13,200
Cabbage	4,500	4,070	4,650
Onions	6,000	5,000	6,000
Market Gardens	5,000	5,000	5,000
Misc. Crops & Farm Gardens(b)	20,300	23,770	22,250
Commercial Truck Crops for Processing	15,100	14,410	9,380
Green Peas	5,100	4,300	3,250
Tomatoes	3,700	3,400	2,350
Snap Beans	1,800	1,650	840
Miscellaneous(c)	4,500	5,060	2,940

(a) 1,185,000 acres planted to wheat represents 90.9 percent of the 1942 allotment of 1,303,000 acres.

(b) Represents difference between individual crops reported and total reported for fresh consumption.

(c) Represents difference between individual crops reported and total reported for processing.

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT

Acreage of Principal Crops Harvested Under Irrigation (Avge. 1929-1938 Incl.)

Units: Acres

CROP	BOULDER	LARIMER	WELD	MORGAN	WASHINGTON	LOGAN	SEDGWICK	TOTALS
<u>Early Season Annuals</u>	<u>25,174</u>	<u>35,143</u>	<u>97,058</u>	<u>12,967</u>	<u>1,432</u>	<u>18,285</u>	<u>4,650</u>	<u>194,709</u>
Wheat	13,597	13,815	36,911	1,807	389	2,524	706	69,749
Oats	3,890	5,691	12,586	1,882	204	3,067	1,270	28,590
Barley	7,687	15,637	47,561	9,278	839	12,694	2,674	96,370
<u>Late Season Annuals</u>	<u>15,362</u>	<u>26,614</u>	<u>144,884</u>	<u>38,028</u>	<u>1,796</u>	<u>28,113</u>	<u>7,315</u>	<u>262,112</u>
Corn	7,917	8,941	28,241	12,522	1,087	9,902	2,241	70,851
Dry Beans	97	1,249	24,540	4,493	120	1,311	25	31,835
Potatoes	95	454	22,503	993	15	428	619	25,107
Sugar Beets	7,253	15,970	69,600	20,020	574	16,472	4,430	134,319
<u>Forage Crops</u>	<u>27,210</u>	<u>39,973</u>	<u>101,256</u>	<u>31,059</u>	<u>10,832</u>	<u>35,189</u>	<u>9,080</u>	<u>254,599</u>
Alfalfa	21,818	33,545	83,889	23,887	2,615	21,160	4,817	191,731
Other Tame Hay	1,700	5,668	4,459	939	46	1,178	251	14,241
Native Hay	3,692	760	12,908	6,233	8,171	12,851	4,012	48,627
<u>Commercial Truck Crops</u>	<u>1,872</u>	<u>1,436</u>	<u>5,340</u>	<u>163</u>	<u>-</u>	<u>144</u>	<u>-</u>	<u>8,955</u>
Cucumbers	59	35	429	81	-	62	-	666
Cant's & Honey Dews	13	4	179	8	-	6	-	210
Lettuce	6	2	35	-	-	-	-	43
Onions	5	10	441	-	-	8	-	464
Tomatoes (Market)	25	20	291	20	-	14	-	370
Tomatoes (Manuf.)	164	13	375	-	-	-	-	552
Green Peas (Market)	-	8	28	-	-	-	-	36
Green Peas (Manuf.)	1,286	1,218	547	10	-	-	-	3,061
Cabbage	161	43	1,771	22	-	28	-	2,025
Watermelons	8	3	166	8	-	14	-	199
Celery	6	6	8	-	-	-	-	20
Cauliflower	3	0	6	-	-	-	-	9
Snap Beans	136	74	1,064	14	-	12	-	1,300
<u>Fruit Crops*</u>	<u>624</u>	<u>4,120</u>	<u>194</u>	<u>51</u>	<u>31</u>	<u>92</u>	<u>-</u>	<u>5,112</u>
TOTALS	70,242	107,286	348,732	82,268	14,091	81,823	21,045	725,487

* Acreage in fruit crops estimated from Water Commissioners' Reports and U. S. Census.
 Source: Colorado Cooperative Crop and Livestock Reporting Service, State Planning Commission -
 U.S.D.A. Division of Agricultural Statistics.

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT

Percent of Total Acreage of Principal Crops Harvested Under Irrigation
(Avge. 1929-1938 Inc.)

CROP	BOULDER	LARIMER	WELD	MORGAN	WASHINGTON	LOGAN	SEDGWICK	TOTAL
<u>Early Season Annuals</u>	<u>35.8</u>	<u>32.8</u>	<u>27.8</u>	<u>15.8</u>	<u>10.2</u>	<u>22.3</u>	<u>22.1</u>	<u>26.8</u>
Wheat	19.4	12.9	10.6	2.2	2.8	3.1	3.4	9.6
Oats	5.5	5.3	3.6	2.3	1.4	3.7	6.0	3.9
Barley	10.9	14.6	13.6	11.3	6.0	15.5	12.7	13.3
<u>Late Season Annuals</u>	<u>21.9</u>	<u>24.8</u>	<u>41.6</u>	<u>46.2</u>	<u>12.7</u>	<u>34.4</u>	<u>34.8</u>	<u>36.2</u>
Corn	11.4	8.3	8.1	15.2	7.7	12.1	10.7	9.8
Dry Beans	0.1	1.2	7.0	5.5	0.9	1.6	0.1	4.4
Potatoes	0.1	0.4	6.5	1.2	-	0.5	2.9	3.5
Sugar Beets	10.3	14.9	20.0	24.3	4.1	20.2	21.1	18.5
<u>Forage Crops</u>	<u>38.7</u>	<u>37.3</u>	<u>29.0</u>	<u>37.7</u>	<u>76.9</u>	<u>43.0</u>	<u>43.1</u>	<u>35.1</u>
Alfalfa	31.1	31.3	24.0	29.0	18.6	25.9	22.9	26.4
Other Tame Hay	2.4	5.3	1.3	1.1	0.3	1.4	1.2	2.0
Native Hay	5.2	0.7	3.7	7.6	58.0	15.7	19.0	6.7
<u>Commercial Truck Crops</u>	<u>2.7</u>	<u>1.3</u>	<u>1.5</u>	<u>0.2</u>	<u>0.0</u>	<u>0.2</u>	<u>0.0</u>	<u>1.2</u>
Cucumbers	-	-	0.1	0.1	-	0.1	-	0.1
Cant's & Honey Dews	-	-	-	-	-	-	-	-
Lettuce	-	-	-	-	-	-	-	-
Onions	-	-	0.1	-	-	-	-	-
Tomatoes (Market)	-	-	0.1	-	-	-	-	0.1
Tomatoes (Manuf.)	.2	-	0.1	-	-	-	-	-
Green Peas (Market)	-	-	-	-	-	-	-	0.4
Green Peas (Manuf.)	1.8	1.1	0.2	-	-	-	-	0.3
Cabbage	.2	-	0.5	-	-	-	-	-
Watermelons	-	-	-	-	-	-	-	-
Celery	-	-	-	-	-	-	-	-
Cauliflower	-	-	-	-	-	-	-	0.2
Snap Beans	.2	-	0.3	-	-	-	-	-
<u>Fruit Crops</u>	<u>0.9</u>	<u>3.8</u>	<u>0.1</u>	<u>0.1</u>	<u>0.2</u>	<u>0.1</u>	<u>0.0</u>	<u>0.7</u>
TOTALS	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Colorado Cooperative Crop and Livestock Reporting Service. State Planning Commission - U.S.D.A. Division of Agricultural Statistics.

TABLE III

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT

Acreage of Crops Harvested Under Irrigation

YEAR	Units - Acres							TOTALS
	BOULDER	LARIMER	WELD	MORGAN	WASHINGTON	LOGAN	SEDGWICK	
1929	76,693	116,463	363,959	75,186	15,926	76,674	25,824	750,725
1930	70,564	115,121	375,715	87,674	16,427	84,247	22,385	772,133
1931	78,709	114,779	341,473	82,031	15,992	76,453	21,344	730,781
1932	62,860	104,464	320,381	78,748	15,420	76,720	22,173	680,766
1933	74,757	102,885	328,554	80,141	15,342	75,988	20,859	698,526
1934	67,885	97,159	303,308	77,905	10,294	73,594	18,261	648,406
1935	64,430	105,975	346,368	81,805	14,289	95,486	19,753	728,106
1936	67,566	103,934	364,048	85,995	11,776	91,829	16,850	741,998
1937	71,652	99,860	365,026	86,708	11,901	80,918	22,105	738,170
1938	<u>67,305</u>	<u>112,224</u>	<u>378,485</u>	<u>86,489</u>	<u>13,538</u>	<u>86,316</u>	<u>20,894</u>	<u>765,251</u>
AVGE.	70,242	107,286	348,732	82,268	14,091	81,823	21,045	725,487

Source: Colorado Coop. Crop and Livestock Reporting Service, State Planning Commission - U.S.D.A. Div. of Agri. Stat.

Crops Included: Corn, Wheat, Oats, Barley, Dry Beans, Potatoes, Sugar Beets, Alfalfa, Native Hay, other Tame Hay, Commercial Truck Crops, and Fruits.

TABLE IV

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT

Total Value of Principal Crops Harvested Under Irrigation (Avge. 1929-1938 Incl.)

Units: Dollars

CROPS	BOULDER	LARIMER	WELD	MORGAN	WASHINGTON	LOGAN	SEDGWICK	TOTALS
<u>Early Season Annuals</u>	<u>524,640</u>	<u>725,240</u>	<u>1,913,070</u>	<u>251,820</u>	<u>26,700</u>	<u>312,380</u>	<u>87,190</u>	<u>3,841,040</u>
Wheat	312,830	316,260	777,470	36,090	8,180	47,150	13,720	1,511,700
Oats	69,200	100,470	206,130	35,320	3,600	52,920	24,710	492,350
Barley	142,610	308,510	929,470	180,410	14,920	212,310	48,760	1,836,990
<u>Late Season Annuals</u>	<u>778,480</u>	<u>1,523,530</u>	<u>9,908,660</u>	<u>2,254,690</u>	<u>77,560</u>	<u>1,533,560</u>	<u>463,200</u>	<u>16,539,680</u>
Corn	185,890	175,930	524,430	282,080	21,810	174,220	51,530	1,415,890
Dry Beans	2,840	37,030	911,910	152,040	4,100	37,300	1,130	1,146,350
Potatoes	9,080	46,330	2,594,110	127,170	1,450	31,890	69,320	2,879,350
Sugar Beets	580,670	1,264,240	5,878,210	1,693,400	50,200	1,290,150	341,220	11,098,090
<u>Forage Crops</u>	<u>480,610</u>	<u>674,890</u>	<u>1,737,840</u>	<u>567,380</u>	<u>102,620</u>	<u>539,250</u>	<u>138,590</u>	<u>4,241,180</u>
Alfalfa	429,330	617,000	1,604,220	508,830	46,280	419,980	100,510	3,726,150
Other Tame Hay	17,540	50,760	39,340	9,380	240	10,780	2,210	130,250
Native Hay	33,740	7,130	94,280	49,170	56,100	108,490	35,870	384,780
<u>Commercial Truck Crops</u>	<u>121,540</u>	<u>79,150</u>	<u>672,270</u>	<u>16,870</u>	<u>-</u>	<u>15,970</u>	<u>-</u>	<u>905,800</u>
Cucumbers	4,130	2,450	30,060	5,680	-	4,375	-	46,695
Cant's & Honey Dews	1,950	675	26,925	1,275	-	975	-	31,800
Lettuce	750	190	4,375	-	-	-	-	5,315
Onions	925	1,850	81,585	-	-	1,385	-	85,745
Tomatoes (Market)	5,250	4,300	61,110	4,095	-	2,940	-	77,695
Tomatoes (Manuf.)	11,510	910	26,230	-	-	-	-	38,650
Green Peas (Market)	-	790	2,890	-	-	-	-	3,680
Green Peas (Manuf.)	51,420	48,720	21,865	420	-	-	-	122,425
Cabbage	23,350	6,305	256,800	3,120	-	4,055	-	293,630
Watermelons	340	120	6,640	320	-	560	-	7,980
Celery	2,390	2,390	3,700	-	-	-	-	8,480
Cauliflower	555	90	1,200	-	-	-	-	1,845
Snap Beans	18,970	10,360	148,890	1,960	-	1,680	-	181,860
<u>Fruit Crops</u>	<u>42,870</u>	<u>220,170</u>	<u>8,270</u>	<u>1,360</u>	<u>720</u>	<u>2,000</u>	<u>-</u>	<u>275,390</u>
TOTALS	1,948,140	3,222,980	14,240,110	3,092,120	207,600	2,403,160	688,980	25,803,090

Source: Colorado Coop. Crop and Livestock Reporting Service, State Planning Commission, U.S.D.A. Div. of Agri. Stat.
 Crop Prices are the State averages for period 1923-1938.

TABLE V

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT
Percent of Total Value of Principal Crops Harvested Under Irrigation
 (Avge. 1929-1938 Incl.)

<u>CROP</u>	<u>BOULDER</u>	<u>LARIMER</u>	<u>WELD</u>	<u>MORGAN</u>	<u>WASHINGTON</u>	<u>LOGAN</u>	<u>SEDGWICK</u>	<u>TOTAL</u>
<u>Early Season Annuals</u>	26.9	22.5	13.4	8.1	12.9	13.0	12.7	14.9
Wheat	16.0	9.8	5.5	1.2	4.0	2.0	2.0	5.9
Oats	3.6	3.1	1.4	1.1	1.7	2.2	3.6	1.9
Barley	7.3	9.6	6.5	5.8	7.2	8.8	7.1	7.1
<u>Late Season Annuals</u>	40.0	47.3	69.6	72.9	37.4	63.8	67.2	64.1
Corn	9.5	5.5	3.7	9.1	10.5	7.2	7.5	5.5
Dry Beans	0.2	1.1	6.4	4.9	2.0	1.6	0.2	4.4
Potatoes	0.5	1.5	18.2	4.1	0.7	1.3	10.0	11.2
Sugar Beets	29.8	39.2	41.3	54.8	24.2	53.7	49.5	43.0
<u>Forage Crops</u>	24.7	20.9	12.2	18.4	49.4	22.4	20.1	16.4
Alfalfa	22.0	19.1	11.3	16.5	22.3	17.5	14.6	14.4
Other Tame Hay	1.0	1.6	0.2	0.3	0.1	0.4	0.3	0.5
Native Hay	1.7	0.2	0.7	1.6	27.0	4.5	5.2	1.5
<u>Commercial Truck Crops</u>	6.2	2.5	4.7	0.5	0.0	0.7	0.0	3.5
Cucumbers	0.2	0.1	0.2	0.2		0.2		0.2
Cant's & Honey Dews	0.1	-	0.2	-		-		0.1
Lettuce	-	-	-	-		-		-
Onions	-	-	0.6	-		-		0.3
Tomatoes (Market)	0.3	0.1	0.4	0.1		0.1		0.3
Tomatoes (Manuf.)	0.6	-	0.2	-		-		0.1
Green Peas (Market)	-	-	-	-		-		-
Green Peas (Manuf.)	2.6	1.5	0.2	-		-		0.5
Cabbage	1.2	0.2	1.8	0.1		0.2		1.1
Watermelons	-	-	-	-		-		-
Celery	0.1	0.1	-	-		-		-
Cauliflower	-	-	-	-		-		-
Snap Beans	1.0	0.3	1.0	-		0.1		0.7
<u>Fruit Crops</u>	2.2	6.8	0.1	0.1	0.3	0.1	0.0	1.1
TOTALS	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Colorado Cooperative Crop and Livestock Reporting Service, State Planning Commission - U.S.D.A. Division of Agricultural Statistics.

Crop prices were the State averages for period 1923-1938.

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT

Total Value of Crops Harvested Under Irrigation

Units - \$1000

<u>YEAR</u>	<u>BOULDER</u>	<u>LARIMER</u>	<u>WEID</u>	<u>MORGAN</u>	<u>WASHINGTON</u>	<u>LOGAN</u>	<u>SEDGWICK</u>	<u>TOTALS</u>
1929	\$2,254	\$3,906	\$15,255	\$2,904	\$205	\$2,181	\$710	\$27,415
1930	2,233	4,265	18,607	3,856	235	2,984	782	32,962
1931	2,185	3,798	14,114	2,945	182	2,128	609	25,961
1932	1,366	2,504	10,666	2,615	162	1,830	636	19,779
1933	2,080	3,006	13,866	3,246	194	2,505	668	25,565
1934	1,881	2,402	9,070	2,403	141	1,940	502	18,339
1935	1,601	2,926	13,860	3,069	215	2,808	738	25,217
1936	1,761	2,792	15,985	3,593	249	2,620	675	27,675
1937	2,109	3,099	15,102	2,984	193	2,316	835	26,638
1938	<u>2,012</u>	<u>3,529</u>	<u>15,875</u>	<u>3,307</u>	<u>299</u>	<u>2,718</u>	<u>733</u>	<u>28,473</u>
AVGE.	\$1,948	\$3,223	\$14,240	\$3,092	\$208	\$2,403	\$689	\$25,803

Source: Colo. Coop. Crop and Livestock Reporting Service, State Planning Commission - U.S.D.A. Div. of Agri. Statistics.

Crops Included: Corn, Wheat, Oats, Barley, Dry Beans, Potatoes, Sugar Beets, Alfalfa, Native Hay, other Tame Hay, Commercial Truck Crops, and Fruits.

Crop prices used are the State averages for period 1923-1938.

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT

Value per Acre of Principal Crops Harvested Under Irrigation (Avge. 1929-1938 incl.)

Units: Dollars

CROP	BOULDER	LARIMER	WELD	MORGAN	WASHINGTON	LOGAN	SEDGWICK	AVERAGE
<u>Early Season Annuals</u>	\$ 21	\$ 21	\$ 20	\$ 19	\$ 19	\$ 17	\$ 19	\$ 20
Wheat	23	23	21	20	21	19	19	22
Oats	18	18	16	19	18	17	19	17
Barley	19	20	20	19	18	17	18	19
<u>Late Season Annuals</u>	51	57	68	59	43	55	63	63
Corn	23	20	19	23	20	18	23	20
Dry Beans	29	30	37	34	34	28	45	36
Potatoes	95	102	115	128	97	75	112	115
Sugar Beets	80	79	85	85	87	78	77	83
<u>Forage Crops</u>	18	17	17	18	9	15	15	17
Alfalfa	20	18	19	21	18	20	21	19
Other Tame Hay	10	9	9	10	5	9	9	9
Native Hay	9	9	7	8	7	8	9	8
<u>Commercial Truck Crops*</u>	65	55	125	105	-	110	-	101
Cucumbers								70
Cant's & Honey Dews								150
Lettuce								125
Onions								185
Tomatoes (Market)								210
Tomatoes (Manuf.)								70
Green Peas (Market)								105
Green Peas (Manuf.)								40
Cabbage								145
Watermelons								40
Celery								435
Cauliflower								185
Snap Beans								140
<u>Fruit Crops</u>	70	70	45	25	25	20	-	55
AVERAGE	28	30	41	38	15	29	33	36

* Not listed by Counties since same average values apply to each county for each crop. Information available only for value and acreage, not production.

Source: Colo. Coop. Crop and Livestock Reporting Service, State Planning Commission, U.S.D.A. Div. of Agri. Statistics. Crop prices used are the State averages for period 1923-1938.

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO
Sheep and Lambs in Transit (Excluding Animals Grazed in Transit)
 (Compiled from Reports of the Colorado Tax Commission)

	<u>ADAMS</u>	<u>JEFF- ERSON</u>	<u>BOULDER</u>	<u>LARIMER</u>	<u>WELD</u>	<u>MORGAN</u>	<u>WASH- INGTON</u>	<u>LOGAN</u>	<u>SEDG- WICK</u>	<u>TOTAL</u>
	(Units: 1000)									
1928	3	-	25	354	476	139	1	61	3	1,060
1929	-	-	19	312	449	145	7	101	5	1,038
1930	-	-	27	385	570	226	10	80	3	1,300
1931	2	-	11	266	370	166	2	79	-	896
1932	2	-	13	272	436	149	-	60	5	939
1933	2	-	5	297	384	128	3	36	10	864
1934	3	1	5	323	296	149	5	51	4	837
1935	3	3	10	258	303	150	1	45	3	776
1936	1	1	5	252	364	128	5	70	2	828
1937	3	1	12	252	318	118	4	27	3	738
1938	4	2	13	152	352	151	2	40	4	719
1939	9	1	7	164	339	177	5	47	3	752
AVGE.	2	1	13	274	388	152	4	58	4	896
%	0.2	0.1	1.5	30.6	43.3	17.0	0.4	6.5	0.4	100.0

Estimated Number to be Fed in 1942
 (Colo. Water Cons. Board estimates based upon U.S.D.A. State Defense Board prod. goals)

<u>Sheep & Lambs on Feed</u>										
1940	1,550	775	11,625	237,150	335,575	131,750	3,100	50,375	3,100	775,000
<u>Production Goal</u>										
% Increase										
for 1942	10	5	10	5	10	5	15	5	5	7.3
1942	1,700	810	12,790	249,000	369,130	138,340	3,560	52,890	3,260	831,480

Source: Colorado Cooperative Crop & Livestock Reporting Service, State Planning Commission -
 U.S.D.A. Division of Agricultural Statistics

TABLE IX

COLORADO WATER CONSERVATION BOARD

NORTHERN COLORADO CONSERVANCY DISTRICT
(Dairy Products)

Source: U. S. Census, 1940

Counties	Cows & Heifers Milked		Milk Produced (Gallons)		Butter Churned for Farms (lbs)		Whole Milk Sold (Gal.)	Cream Sold (lbs. butter fat)	Butter Sold (lbs)
	1934	1939	1934	1939	1934	1939	1939	1939	1939
Boulder	7,193	6,367	4,023,381	4,082,518	86,970	58,696	2,946,405	141,832	18,142
Larimer	6,841	6,438	3,300,586	3,823,370	117,619	92,869	2,133,436	221,008	18,701
Logan	8,354	6,671	3,294,307	3,263,893	144,795	128,207	277,701	599,342	9,248
Morgan	7,889	4,642	3,441,740	2,371,103	110,156	71,576	537,692	316,848	3,090
Sedgwick	3,011	2,365	1,183,498	1,234,800	64,725	42,933	65,703	224,857	2,605
Weld	25,590	19,242	13,206,806	11,263,321	354,852	224,788	7,041,713	568,069	48,122
Total	58,878	45,725	28,450,318	26,039,005	879,117	619,069	13,002,650	2,071,956	99,908
State Total	257,746	190,851	106,820,253	100,535,595	4,140,444	2,986,689	34,289,958	12,073,251	382,700
Northern Colo. percent of State Production	22.8	24.0	26.6	25.9	21.2	20.7	37.9	17.2	26.1

Value (1) (Northern Colorado Conservancy District)

\$1,956,890

\$642,300

\$33,970

(1) State average prices for periods 1923-1938

TABLE X

