



Western Regional
BIOMASS
Energy Program

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STATE OF NEBRASKA

Nebraska Survey of Biomass:

**Availability and Energy
Utilization Potential**

NEBRASKA SURVEY OF BIOMASS:

AVAILABILITY AND ENERGY
UTILIZATION POTENTIAL

REPORT PRESENTED TO

NEBRASKA ENERGY OFFICE

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NEBRASKA SURVEY OF BIOMASS:
AVAILABILITY AND ENERGY UTILIZATION POTENTIAL

EXECUTIVE SUMMARY

1.0 Introduction

The State of Nebraska is participating in the Western Regional Biomass Energy Program (WRBEP), one of five U.S. Department of Energy Regional Biomass Energy Programs. The purpose of these programs is to stimulate private sector use of biomass energy technologies and to encourage technology transfer efforts.

This project has analyzed the potential for conversion of Nebraska's biomass resources into energy resources on a county-by-county basis. The analysis includes a summary of the total resource produced, the amount of the biomass resource that is available for energy conversion, and the amount of energy that could be produced in the form of heat, liquid fuel or gaseous fuel. Alternative conversion technologies will be examined as appropriate for the resource.

2.0 Summary of Methodology

Production data in the form of acres of forests and crop land in use and the average productivity for this land was assembled using the 1987 Nebraska Agricultural Statistics as the base. The crop lands of interest for estimating harvestable crop residues are the Soil Conservation Service Class I, II, and III lands, so the distribution of these lands was also determined.

Crop production by land class was estimated for both irrigated and non-irrigated farming using the assumption that the most valuable crops will be preferentially planted on the best land. The crops considered in this inventory are corn, soybeans, sorghum, wheat, alfalfa, barley, oats, and sugar beets.

Crop residues available for use as an energy resource were estimated using accepted ratios describing residue weight per product weight and by taking into account the conservation requirements applicable to the land class on which the crop was grown. Residues on Class I lands can be harvested completely, while 80 percent of the residues from Class II lands can be harvested. Only 50 percent of residues from Class III lands can be taken. No residue harvest is permitted from Classes IV - VIII. In addition, a residue harvest efficiency of 70 percent was applied to all residues.

Forest products were inventoried using the 1983 Forest Products Inventory. The species considered are cottonwood, bur oak, green ash and ponderosa pine. Manure resources from feedlots were also estimated.

Each residue resource was evaluated as a potential energy source for production of synthetic natural gas using anaerobic digestion, electricity by direct combustion, ethanol via fermentation, and methanol by gasification and synthesis. Corn and sorghum were also considered as resources for fermentation ethanol, after allowing for animal feeding requirements to be met.

3.0 Summary of Findings

3.1 Land Resources and Utilization

The majority of the commodity crops grown in Nebraska appear to be grown on Class I, II, and III lands. An analysis of the trends in participation in the Conservation Reserve Program (CRP) suggests that the higher quality land is being farmed and the poorer lands are in the reserve. The conclusion drawn from this is that the CRP lands are not likely to be useful as an additional resource for production of energy crops or harvestable residues.

Similarly, the forest resources of the state are shrinking in terms of area, but stable or increasing slightly in terms of net volume of growing trees. There is a high utilization of the oak and ash resources for fuel wood now. The cottonwood and ponderosa pine resources are used as saw logs, veneer and posts, with relatively little used as fuel. The forestry resource does not appear to be easily expanded to accommodate energy production beyond the current level of use. In fact, there is a likelihood that the oak fuel wood resource is declining.

3.2 Resources Not Useful for Energy Conversion

Several of the crops surveyed are considered to be not suitable for contributing as biomass energy resources. Alfalfa, barley, oats, and soybeans have higher value uses than energy and were not considered as resources. The residues of oats and soybeans were also not considered. Sugar beets can be used to produce ethanol, but there is not sufficient production to support the minimum economically viable plant, 20,000,000 gallons

per year. Wheat combined with harvestable residues is available in sufficient quantities to support a 20,000,000 gallon per year plant only in two counties. Therefore, wheat was not considered as a viable resource for ethanol.

The feedlot wastes in the state are insufficient in quantity to support either anaerobic digestion for methane or gasification facilities. In fact, anaerobic digestion of feedlot wastes and of crop residues for the production of synthetic natural gas is not economically feasible for the state. The distribution of methane production potential for the state is shown in Figure 1.

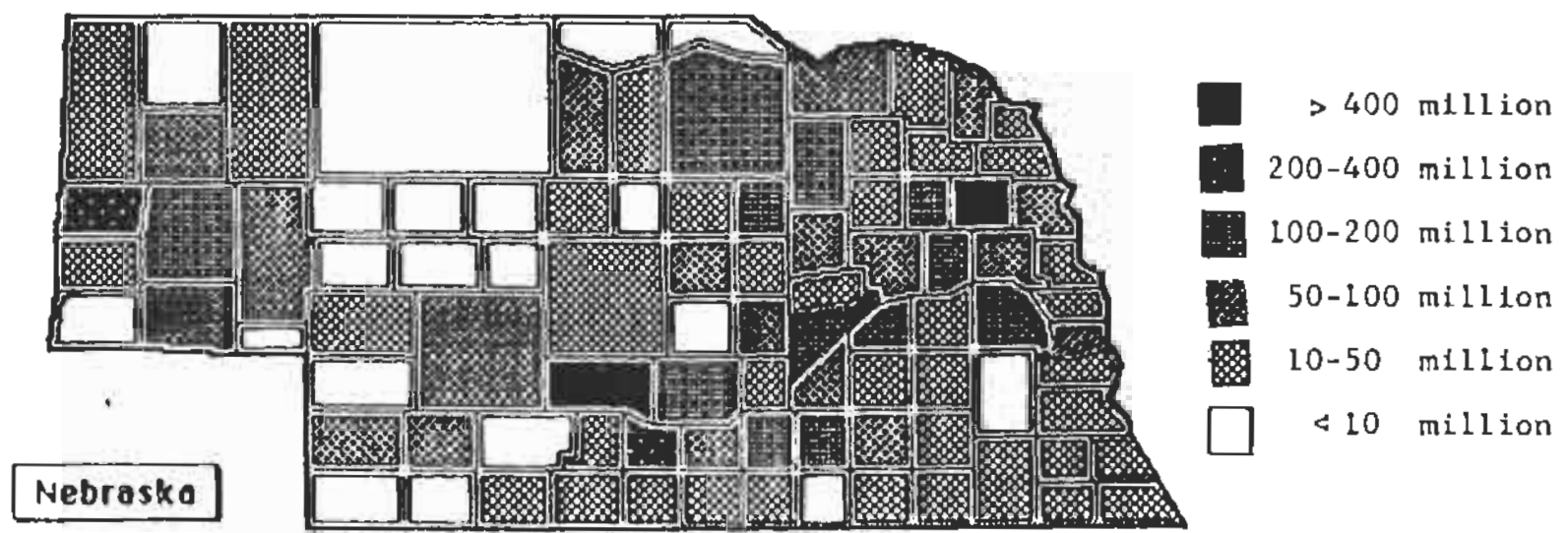
3.3. Ethanol Production

There is sufficient corn production, after animal feed requirements have been met, that 34 counties could support 20,000,000+ gallon per year (20 MM+ gpy) plants and 16 counties can support 40 MM+ gpy operations. When harvestable residues are included for corn, then 45 counties can operate at the 20 MM+ gpy level and 22 counties could support 40 MM+ gpy operations. Currently approximately 10,000,000 gallons per year of ethanol are produced from corn in the state.

Sorghum is much less attractive as a basis for ethanol production. Seven counties can support a 20 MM+ gpy plant.

The fact that usually there are several significant crops grown in a county expands the locally available resource considerably. When considering potential ethanol from all sources, using grain fermentation and cellulose conversion of residues, the economically viable potential production for the state is impressive. Fifty-seven counties can support 20 MM+ gpy

Figure 1
Total Methane Potential from Residues and Manure
(Million Cubic Feet Per Year, By County)



plants and 22 counties could support operations at 50 MM+ gpy. This means that out of the 2100 million gallons of gasoline used in the state annually, 1560 million gallons could be ethanol produced in economically viable sized plants. The total potential ethanol production using all resources is 2940 million gallons. The distribution of potential ethanol production from all sources is shown in Figure 2.

3.4. Methanol Production

The residue materials can also be converted to methanol using a process of gasification. The gasification scheme converts the residues into a mixture of carbon monoxide and hydrogen, and then to methanol. Approximately 0.365 pounds of methanol are possible from each pound of residue.

The total methanol capability for the state is 1908 million gallons. There are 18 counties that can support the minimum economically viable plant, 30 MM gpy, and 8 counties can support a 50 MM+ gpy operation. The approximate economically producible methanol capacity for the state is 908 MM gpy. The distribution of potential methanol production from residues is shown in Figure 3.

The total fuel yield per pound of residue is higher for methanol than for ethanol for all of the residues considered, except for sorghum. The sorghum residues actually produce more ethanol per pound because of the natural sugars present in the stalks.

3.5. Direct Combustion of Residues

Another alternative use for crop residues is direct

Figure 2
Total Ethanol Potential from Grain and Residues
(Million Gallons Per Year, By County)

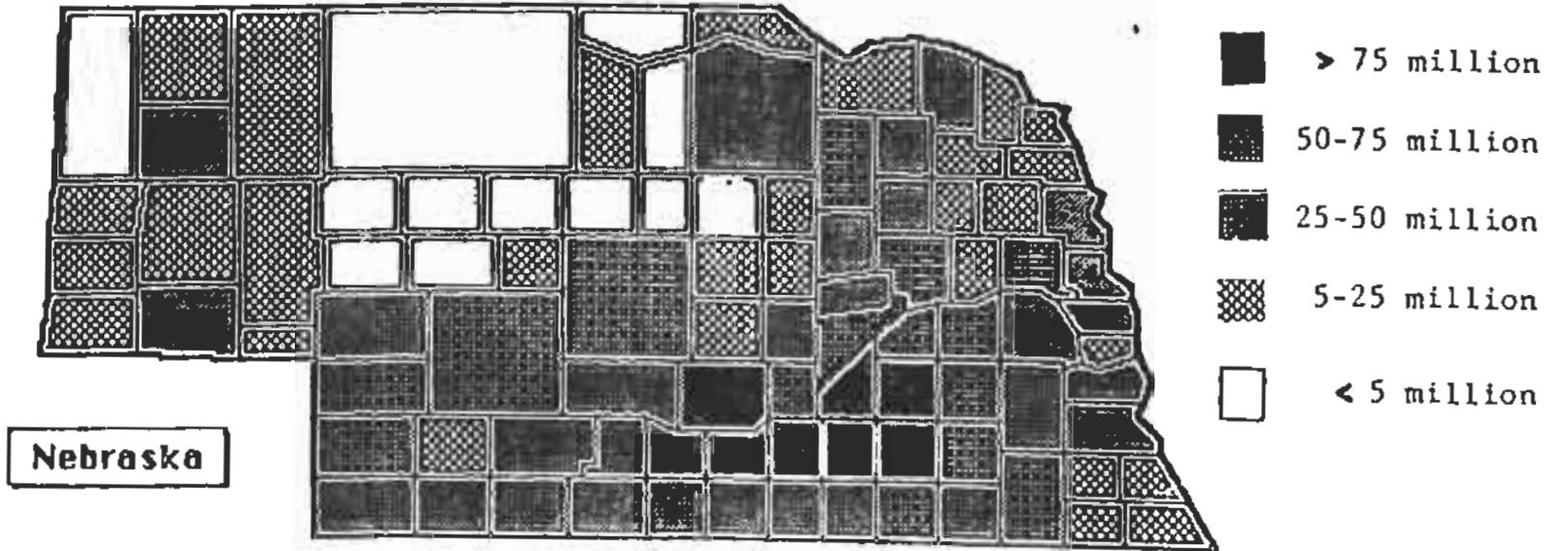
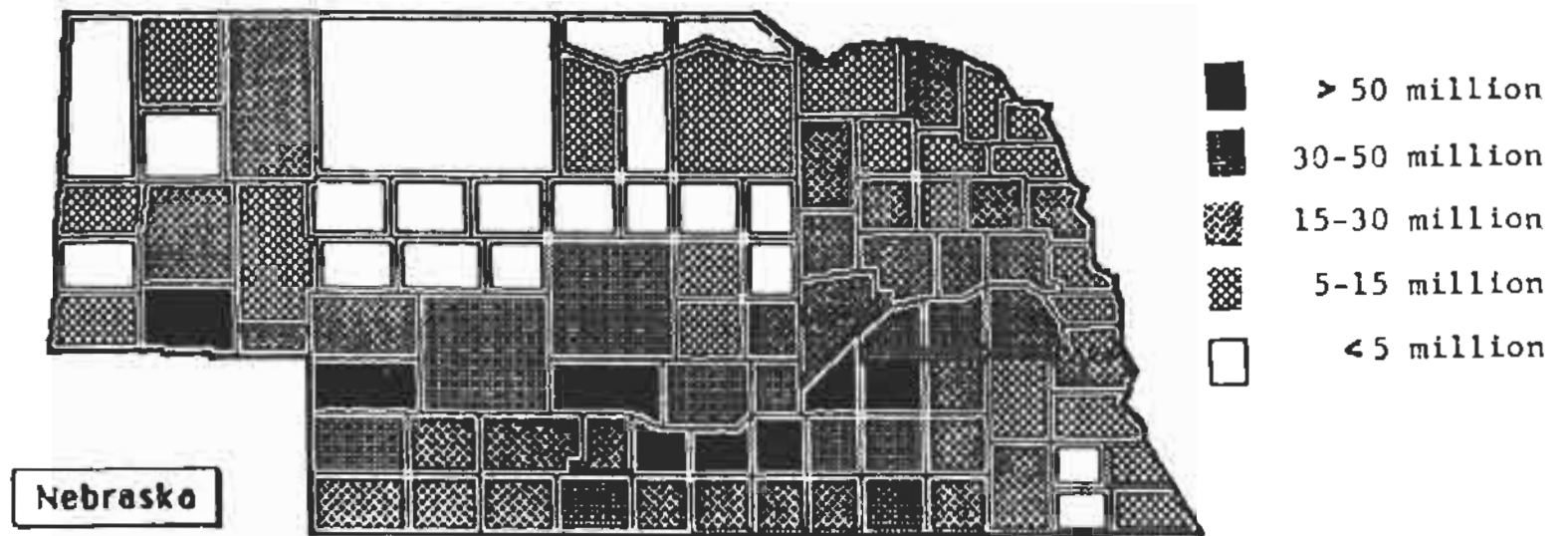


Figure 3
Total Methanol Potential from Residues
(Million Gallons Per Year, By County)



combustion. The energy potential for combustion of residues was evaluated on the basis of replacing fossil fuels with residues in electrical power generation. The major problem associated with this use is the necessity of densification and transportation of the residues to the power generation site. The total harvestable residues in the state represent a potential 64,185 million kilowatt hours, compared with 16,763 million kilowatt hours actually used. Eighty-three of the 93 counties can meet all of their electrical needs by burning harvestable residues. The distribution of potential electrical production from combustion of residues is shown in Figure 4.

4.0 Summary

Nebraska has the potential to be relatively energy self-sufficient in liquid fuels and electrical power. This goal of sufficiency must be tested for economic viability before it is considered as a policy goal. The use of harvestable residues for a combination of methanol synthesis and electrical power generation appears to be highly attractive. The production of ethanol from excess corn, sorghum residues, and some contribution from sugar beets and other grains also is attractive. Feedlot wastes are not in sufficient quantity and concentration to have an impact of energy resources, unless the conversion is a part of a waste treatment strategy at a local scale. The forestry resources must be considered to be fully utilized now. Finally, it appears that acreage currently enrolled in the Conservation Reserve Program (CRP) will generally not be suitable for producing residue resources for energy production.

Figure 4
Total Electrical Potential from Combustion of Residues
(Million Kilowatt Hours Per Year, By County)

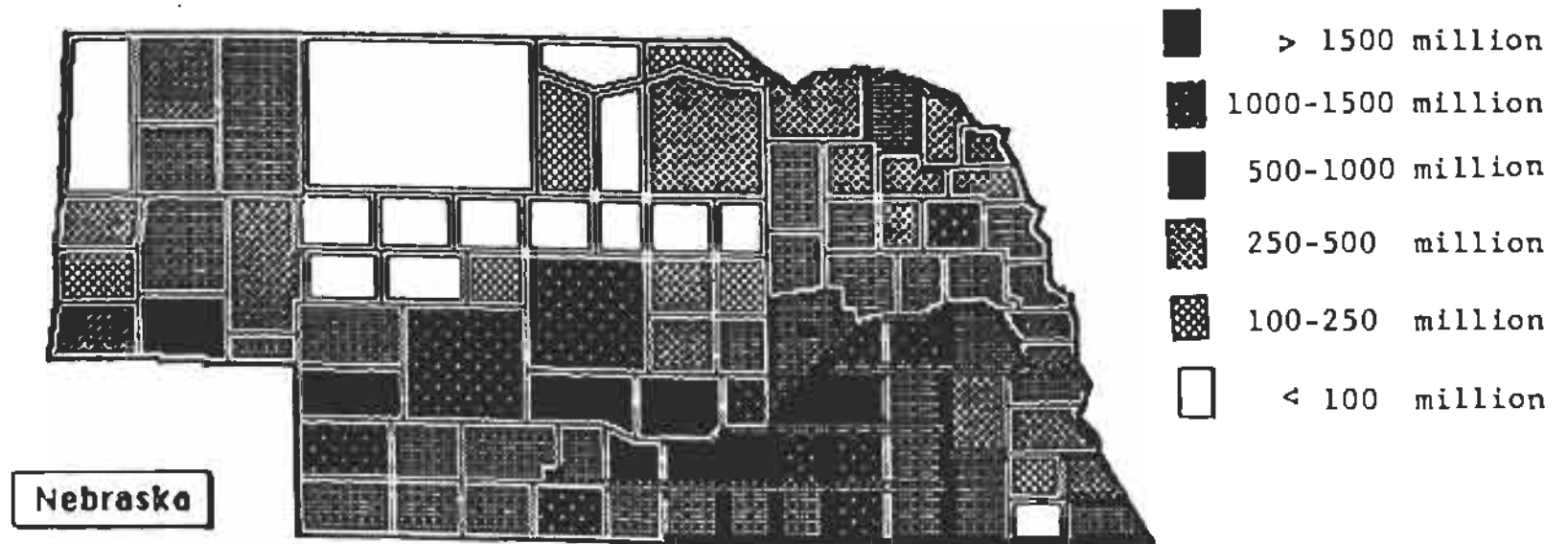


TABLE OF CONTENTS

1.0 Introduction	1
2.0 Agricultural Data	1
3.0 Crop Residue Calculations	3
4.0 Estimating Crop Acres by Land Class	4
5.0 Crop and Residue Production Data	5
6.0 Livestock Manure Utilization	7
7.0 Forestry Products and Utilization	9
8.0 Energy Conversion Technologies	10
8.1 Fermentation for Ethanol Production	11
Table A Yield Factors Used for Fermentation Ethanol Production	12
Table B Approximate Energy Content Per Gallon for Liquid Fuels	15
8.2 Methanol Production from Synthesis Gas	15
8.3 Other Energy Uses for Crop Residues	17
Summary	18
References	19
Appendix A Tables	20
Table 1. Commercial and Non-Commercial Forest Land in the State of Nebraska, Acres	21
Table 2. Non-Irrigated Crops	24
Table 3. Distribution of Nebraska Agricultural Land by Soil Conservation Service Land Capability Classification	25
Table 4. Total Farm Acres, Class I, II, and III Acres Available and Acres Tentatively Accepted for the CRP Program Through the 9th Signup by Reporting District and County	28
Table 5. Nebraska 1987 Crop Production by Reporting District Acres Planted as Irrigated Crops Source: Nebraska Ag Statistics, Natural Resource Commission Database	31

Table 6.	Nebraska 1987 Crop Production by Reporting District Acres Planted as Non-Irrigated Crops Source: Nebraska Ag Statistics, Natural Resource Commission Database	34
Table 7.	Nebraska 1987 Crop Production by Reporting District Acres Planted as Non-Irrigated Crops Source: Nebraska Ag Statistics, Natural Resource Commission Database	37
Table 8.	Nebraska 1987 Crop Production by Reporting District Irrigated - Bushels Per Acre (Unless Noted) Source: Nebraska Ag Statistics Natural Resource Commission Database	40
Table 9.	Nebraska 1987 Crop Production by Reporting District Non-Irrigated - Bushels Per Acre (Unless Noted) Source: Nebraska Ag Statistics Natural Resource Commission Database	43
Table 10.	Nebraska 1987 Crop Production by Reporting District Non-Irrigated - Bushels Per Acre (Unless Noted) Source: Nebraska Ag Statistics Natural Resource Commission Database	46
Table 11.	Residues Available for Conversion to Methanol, Synthetic Natural Gas, or Direct Heat	49
Table 12.	Net Volume of Growing Stock on Commercial Forest Land by County and Species (Thousand Cubic Feet)	52
Table 13.	Estimated Use of Commercial Timber Products for the Major Species by County (Thousand Cubic Feet)	55
Table 14.	Estimated Use of Commercial Timber Products for the Major Species by County (Thousand Cubic Feet)	58
Table 15.	Number and Location of Nebraska Sawmills by Size (Million Board Feet) and by County	61
Table 16.	Estimated Potential Ethanol Capacity in Nebraska by County Based on Corn Available After Livestock Needs	64
Table 17.	Feed Requirements for Livestock	67
Table 18.	Estimated Potential Ethanol Capacity in Nebraska Based on Harvestable Corn Residues	68
Table 19.	Estimated Potential Ethanol Capacity in Nebraska Based on Sugar Beets	71

Table 20.	Estimated Potential Ethanol Capacity in Nebraska Based on Grain Sorghum and Harvestable Residues	74
Table 21.	Estimated Potential Ethanol Capacity in Nebraska Based on Barley and Harvestable Residues	77
Table 22.	Estimated Potential Ethanol Capacity in Nebraska Based on Wheat and Harvestable Residues	80
Table 23.	Comparison of Potential Ethanol Production With Estimated Gasoline Consumption	83
Table 24.	Comparison of Utilization of Corn Residues to Produce Ethanol or Methanol for Liquid Fuel . .	86
Table 25.	Comparison of Utilization of Sorghum Residues to Produce Ethanol or Methanol for Liquid Fuel .	89
Table 26.	Utilization of all Grain Residues to Produce Methanol Using Gasification and Methanol Synthesis Technologies	92
Table 27.	Potential for Methanol Production From Feedlot Wastes Using Gasification and Methanol Synthesis Technologies	95
Table 28.	Potential for Utilization of Crop Residues and Feedlot Manure for Synthetic Natural Gas by Anaerobic Digestion Compared With Estimated Annual Natural Gas Usage	98
Table 29.	Potential for Utilization of Crop Residues and Feedlot Manure for Electrical Power Generation by Direct Combustion Compared With Estimated Annual Electrical Usage	101

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1.0 Introduction

The State of Nebraska is participating in the Western Regional Biomass Energy Program (WRBEP), one of five U.S. Department of Energy Regional Biomass Energy Programs. The purpose of these programs is to stimulate private sector use of biomass energy technologies and to encourage technology transfer efforts.

This project has analyzed the potential for conversion of Nebraska's biomass resources into energy resources on a county-by-county basis. The analysis includes a summary of the total resource produced, the amount of the biomass resource that is available for energy conversion, and the amount of energy that could be produced in the form of heat, liquid fuel or gaseous fuel. Alternative conversion technologies will be examined as appropriate for the resource.

2.0 Agricultural Data

The estimates of crops and residues available for conversion to various forms of energy are based upon the 1987 crop year. Gross tonnages of row crop and small grain residues were determined for all 93 counties in the state of Nebraska. The specific objective of the study was, however, to determine the net tonnages of the several biomass resources actually available after accounting for competing demands. Primary alternative demands for crop residues are : 1) conservation compliance

requirements of the Agricultural Stabilization and Conservation Service (ASCS), 2) livestock forage, and 3) individual preferences for erosion control and cropping systems.

Additional sources of biomass energy are grains and livestock manures. Cattle and hog feedlot manure recoverable and the grain surplus (deficit) were calculated on a county basis. In specific, the county grain surplus (deficit) is equal to the county corn production, less the livestock feeding requirement. This approach does not recognize the contribution of other grains such as milo and oats to livestock feeding, nor does it recognize the simultaneous flow of county grains to the food, industrial, seed, alcohol, or export sectors.

While not generally perceived as a timber producing state, Nebraska has commercially significant timber production in several localities. The acres devoted to commercial timber and the commercial production of the four most important species, cottonwood, bur oak, green ash, and ponderosa pine are presented in detail in Table 1. Use of forest products is divided between saw logs, including a small usage for veneer and poles, and fuel wood. A census of Nebraska sawmills by capacity and county is also included.

Crop acres and yields are reported in the 1987 Nebraska Agricultural Statistics. The data are available in the Nebraska Natural Resource Commission's (NNRC) Natural Resources Data Bank. County-level Land Capability Classes are also available from the NNRC. Land Capability Class data were collected by the Soil Conservation Service (SCS) and reported in the 1982 National

Resources Inventory (NRI). The 1987 Census of Agriculture (Nebraska: State and County Data) compiles fed livestock marketings and Conservation Reserve Program (CRP) acreage information. Feedlot capacities were obtained from the Nebraska Department of Environmental Control and the Nebraska Agricultural Statistics. Forestry data was summarized from the 1983 inventory done by Raile (1986).

3.0 Crop Residue Calculations

The usable crop residues were estimated using the residue yield factors proposed by Larson, et al. (1978) which give the relationship between crop residue weight and grain yield weight (fodder to grain ratio). The fodder to grain ratio and the pounds of grain per bushel for different grains is given in Table 1. These values are similar to those given by SRI (1979) as modified to account for needed field cover to maintain field protection (ORNL, 1982). The results are presented in a form similar to the Illinois biomass resource survey completed by Argonne National Laboratory (1980). The first step in calculating net available biomass was to determine the land capability class for each planted acre of grain. Eight land capability classes have been established by the SCS. However, residues may only be removed from classes I, II, and III lands in accordance with ASCS land conservation requirements.

Class I lands can be used for continuous crop production. They have slopes of less than 2%. All crop residues may potentially be removed from Class I land. Class II land has slopes of 2 - 5%, and 20 % of the crop residue must be maintained

on the surface of the soil to maintain soil conservation protective requirements. Class III soils have severe cropping limitations, with slopes of between 6 and 11%. At least 50% groundcover must be maintained. Approximately ten percent of Class III land is farmed under no-till operations, so crop residues are available for harvest. However, ninety percent of Class III land is farmed with conventional tillage practices, which incorporate the residue. Since incorporated residue is unharvestable after it is incorporated, only 10% of Class III land has harvestable residue, of which only 50% can be removed. Crop residues cannot be removed from Land Capability Classes IV - VIII because of severe limitations such as steep slopes requiring ground cover, stones, swamps, etc.

In summary, harvestable residue is a function of both the conservation requirements (land class) and harvest efficiency. Typically available residues can be harvested with a 70% efficiency. This means that the amount of residues actually available from Class I land is 70% of the theoretical residue yield (fodder to grain ratio). Similarly, only 56% of the residues from Class II lands are available and 3.5% of the residues from Class III lands can be used.

4.0 Estimating Crop Acres by Land Class

Biomass can be harvested from Class I, II, and III land, but the actual amount of available biomass is also directly related to the specific crops planted on each land class. An allocation process had to be established which would estimate the specific crop acres and their land capability classes. The NRI reports

non-irrigated and irrigated land capability classes. The NRC Data Bank reports non-irrigated and irrigated crop acres and yields. County level data are available for each data set.

The allocation process is an estimate, since crop acres are not reported by land capability class. However, several basic assumptions were made. First, the crop that yielded the highest net return per acre was allocated to the most productive land. Any remaining land in the same class would be allocated to the next most valuable crop, and so on. The crops were ranked in the order shown in Table 2. The only irrigated crops analyzed were corn, alfalfa, soybeans, and sorghum. They were allocated in the order given.

For example, assume the amount of Class I, II, and III land is 500, 1000, and 400 acres, respectively. A total of 700 acres of corn would be allocated as 500 acres in Class I and 200 acres in Class II. The remaining Class II acres would be allocated to the next most profitable crop until all of the land and all of the crops are allocated.

This allocation process is an estimate of the actual crop acreages among the different land capability classes. The actual allocation will differ for individual farmers and among Crop Reporting Districts.

The methodology used here explicitly allows for the fact that not all residues can be harvested (harvest efficiency). Also, this method recognizes the fact that not all residues should be harvested. The result is a set of estimates that is inherently conservative in terms of total potential resource, but sustainable for long term productivity.

5.0 Crop and Residue Production Data

The crop and residue production data given here are based only on crops produced on Class I, II, and III lands. For this reason the total crop production given will be somewhat lower than the actual totals reported in the 1987 Nebraska Agricultural Statistics. The estimates for energy product potential is also based on the lower figure.

The distribution of land by soil classification among Classes I, II, and III is given for the 93 counties in Table 3. The data in the table and throughout this report are arranged by county, within the several crop reporting districts. This arrangement makes it easier to see the regional/geographical differences among the resources.

The Conservation Reserve Program (CRP) has the intent of setting aside up to 25 percent of the acreage classified as farms in a county from active crop production. Table 4 summarizes the acreages designated as farms, total Class I, II and III acres and CRP set aside acres. The information is current as of the ninth enrollment in February, 1990. Also shown is the percentage Class I, II and III land and percentage CRP land on a county by county basis.

It is evident from Table 4 that counties with relatively little higher quality land tend to participate more in the Conservation Reserve Program. There are a few counties, particularly in the southeast, that appear to have some of the Class I, II, or III land involved in the CRP set aside. The disparity between farm acres and Class I, II, III acres for

Frontier county may be an indicator of land not in production or changes in land use between the census year, 1987, and the CRP census, 1990.

The acres of the irrigated crops: corn, sorghum, soybeans, and alfalfa planted on Class I, II, and III lands are summarized in Table 5. The non-irrigated crops: corn, sorghum, wheat, soybeans, alfalfa, oats, beets and barley are tabulated in Tables 6 and 7. Table 8 shows yields for irrigated crops, while Tables 9 and 10 give the same information for the non-irrigated crops.

Total residues harvestable for both irrigated and non-irrigated crops are summarized in Table 11. The figures given represent 70% of the residues from Class I lands, 56% of the Class II residues and 3.5% of the Class III materials. The total amount of feedlot manure is based on the data and assumptions described in the next section.

6.0 Livestock Manure Utilization

Large Nebraska feedlots produce tons of manure which, if not properly disposed of, are potential sources of serious pollution. The data for estimating the quantity of the manure resource in the state was collected from the 1987 Nebraska Census of Agriculture, the Nebraska Department of Environmental Control and the Nebraska Agricultural Statistics.

Proprietary information has not been disclosed. If four or more feedlots are in operation in a county and if less than 60% of total county capacity was produced in any one feedlot, then the more accurate data from the Nebraska Agricultural Statistics (NAS) were reported. The data from the Nebraska Department of

Environmental Control, which is public information, was reported if fewer than four feedlots operated, or if 60% of the county total was produced in one feedlot. In order to assure confidentiality, only the aggregate figures for cattle and hog manure are reported in this document on a county basis.

The expected manure output of the 2000-head plus feedlots is based on the expected number of cattle on feed. The number of cattle on feed at a given time is estimated to be 70% of the feedlot capacity. The amount of manure actually available is affected by feed consumption, climate, cattle densities, and the manure removal technique.

Cattle consuming 20 pounds of feed a day will pass about 5 pounds of manure per day. Typically, only 50% of the deposited manure is recoverable. In order to estimate the total manure resource, it was assumed that cattle are fed about 350 days per year, with the other 15 days for manure removal, marketings, and cattle replacement.

The December hogs and pigs inventory in 1000-head plus lots is reported in the 1987 Census of Agriculture. The expected annual average inventory is assumed to be the same as the December inventory, although seasonality of production is present. Manure is assumed to be produced 350 days per year.

The **Livestock Waste Facilities Handbook** indicates that a finishing pig passes slightly less than one pound of dry matter per day. However, as in the case of cattle manure, only 50% recovery is anticipated. The efficacy of recovering hog and pig manure is questionable. Small operators can disperse manure over

their farmland, thus avoiding the pollution that results from large concentrations of manure. Similarly, transporting small lots of manure to a conversion facility is an expensive alternative.

7.0 Forestry Products and Utilization

Four species, cottonwood, white oak, green ash, and ponderosa pine account for more than 80 percent of the forestry products produced in the State of Nebraska. The net volume of the growing stock for these four species is summarized in Table 12. The growing stock is representative of the potential supply, rather than annual production.

Annual production and use data for cottonwood and oak are summarized in Table 13 and data for green ash and ponderosa pine are given in Table 14. County-by-county data are not available. The figures in Tables 13 and 14 were estimated using the statewide annual production of saw logs, veneer and poles in 1980 as an aggregate for saw logs and taking the ratio of the production volume to the net volume of growing stock for the species and multiplying this ratio by the net volume of growing stock in the county. The county-by-county production of fuel wood was computed similarly.

It is important to note that there already is a significant use of timber as fuel wood in Nebraska. Seventy-seven percent by volume of the timber used in Nebraska in 1980 was for fuel wood. The oak and ash grown is essentially all used as fuel wood. The cottonwood and ponderosa pine are mostly used as saw logs.

There is little likelihood of significant expansion of the energy use from forestry products in the state. As seen in Table 15, there are few sawmills of sufficient size to collect sawdust and bark for energy use. The rate of ash fuelwood use allows for a 15 year regrowth period while that for oak is only 8.5 years (net volume growing stock/annual use as fuelwood). It appears that oak may be used faster than it can be replaced.

The Nebraska forest inventory (Raile, 1986) showed a substantial drop in forested acres between 1955 and 1983, but the volume of growing stock for softwoods doubled over the period and the volume of hardwoods was essentially constant. The changes indicate more intensive silviculture of softwoods in the Northwest District and (probably) better silviculture practice for hardwoods throughout the state. There appears to be little opportunity for expansion of forestry and there continues to be some pressures to convert forested lands into crop agriculture.

8.0 Energy Conversion Technologies

The primary categories of biomass energy utilization technologies are:

- a) Direct firing for heat
- b) Gasification
 - 1) Anaerobic digestion to produce methane
 - 2) Producer gas generation for low BTU gas
 - 3) Thermochemical conversion to synthesis gas for direct firing or production of other fuels (methane, methanol, gasoline)
 - 4) Thermochemical liquefaction to produce synthetic crude oil
- c) Fermentation for production of ethanol
 - 1) Starch/sugar fermentation
 - 2) Xylose fermentation
 - 3) Cellulose conversion to glucose

The basic process descriptions and energy yields for these technologies have been summarized by a number of authors (SRI, 1980; Lowenstein, 1985). The energy yield for the best presently available technology under each of the categories listed above will be used to compute the energy available from each resource.

In many cases the same resource can be used in several different conversion processes. For example, corn kernels can be burned, fermented to ethanol, gasified anaerobically or thermochemically or made into synthetic crude oil by liquefaction. The energy yield and final product yield (BTU's of heat, gallons of ethanol, etc.) will be calculated for options considered appropriate for the resource.

8.1 Fermentation for Ethanol Production

Ethanol may be used as a liquid transportation fuel either as pure ethanol or in a 10% mixture with gasoline (gasohol). Fermentation ethanol may be produced either from starch and/or glucose (six carbon sugar), from pentoses (five carbon sugars), or from the conversion of cellulose and hemicellulose to glucose and pentoses.

Glucose is available from sugar beets and, to some extent from sorghum residues. All grains are primary sources for starch, which can be hydrolyzed to form glucose. Utilization of glucose or starch resources is a conventional technology which is employed commercially throughout the world.

Utilization of hemicelluloses and cellulose as a fermentation substrate requires that the materials first be reduced to the component sugars before fermentation takes place.

The reduction of hemicelluloses to pentoses and some hexoses is fairly simple, but the fermentation yields are still fairly poor. Cellulose, a polymer of glucose, can be reduced to glucose either enzymatically, or by using mineral acids to hydrolyze it.

There is considerable variation in the literature with regard to the yield of ethanol from a given substrate. The values used in this work and shown in Table A represent an average of several results reported in the literature. Actual yields, particularly in the case of residue utilization, may vary considerably. The conversion factors used for residues are all based on acid hydrolysis results.

Table A

Yield Factors Used for Fermentation Ethanol Production

Corn	0.595 lit/kg
Wheat	0.41 lit/kg
Barley	0.41 lit/kg
Sorghum	0.41 lit/kg
Sugar Beet	0.63 lit/kg
Corn Residue	0.18 lit/kg
Wheat Residue	0.21 lit/kg
Barley Residue	0.13 lit/kg
Sorghum Residue	0.51 lit/kg

Soybean residues were not considered because they typically are not harvested. Alfalfa was considered to be a forage crop only and was not considered an energy resource, although it would have about the same conversion ratio as the small grain residues.

Table 16 summarizes the computation of the potential yield of ethanol from corn for the state of Nebraska. The restrictions placed on the results in the table are that only corn grown on Class I, II, and III lands is considered, and that corn must first be used to satisfy the livestock feed demand in a county before it can fulfill any other uses.

It is important to recognize that there are a number of counties that operate at a deficit with respect to corn. Also, there are a number of counties that cannot support an ethanol plant of capacity 20,000,000 gallons per year, the approximate minimum economical size facility.

The livestock feed grain utilization was calculated using data from the 1987 Nebraska Census on Agriculture, using a USDA developed procedure for estimating feed grain disappearance. Table 17 shows the annual consumption of feed grains for a number of types of animal.

Table 18 expands the potential ethanol from corn to include ethanol produced from the harvestable corn residues produced. While there appears to be a considerable ethanol potential, it is important to note that relatively few counties have enough harvestable residue to support a cellulose conversion facility larger than 10,000,000 gallons per year. Cellulose conversion is more expensive than fermenting sugars, so it is not certain that all of the capacity shown in the table can be realized.

Sugar beets are a potentially viable basis for an ethanol facility in the Northwest Reporting District, as seen in Table 19. Other grains and their residues are summarized with respect

to potential ethanol production in Tables 20, 21, and 22. The high ethanol yield from sorghum residue is particularly interesting (Table 20). There are several counties where a combined grain and residue processing facility could be appropriate.

The fundamental purpose of this study is to identify areas where biomass-based raw materials can make a significant impact on the fossil fuel requirements of the state. The annual estimated gasoline consumption for the state is compared with the potential ethanol production in Table 23. The gasoline consumption on a county-by-county basis was estimated using a summary of annual vehicle miles provided by the Nebraska Department of Roads Office and using an average performance of 16.5 miles per gallon. The estimated gasoline consumed of 835 million gallons per year compares well with the 773 million gallons reported for 1987 in the 1960 - 1987 Energy Statistics prepared by the Nebraska Energy Office. It is important to note that Nebraska is potentially self-sufficient in liquid fuels, and, in fact, is a potential exporter of fuels with no effect on the livestock industry.

The equivalency of one gallon of ethanol for one gallon of gasoline used in Table 23 requires further comment. The energy content of gasoline, ethanol, and methanol, also derivable from biomass, are different. Table B compares the three liquid fuels on the basis of energy content per gallon. However, energy content does not translate directly into fuel performance in terms of volume of fuel required per mile driven. Scheller (1979) suggests that a ratio of 1.6 gallons of crude oil per

Table B

Approximate Energy Content Per Gallon for Liquid Fuels

Gasoline	115,000	Btu/gallon
Methanol	67,000	Btu/gallon
Ethanol	87,000	Btu/gallon

gallon of ethanol is a more accurate figure to use in comparing overall fuel performance. The more modest ratio of 1.0 gallon of ethanol = 1.0 gallon of gasoline is assumed in this work.

8.2 Methanol Production from Synthesis Gas

Any biomass material can be broken into a mixture of hydrogen, carbon monoxide, carbon dioxide, light hydrocarbons, organic liquids, char and tar by the combined processes of pyrolysis and gasification. Pyrolysis is the thermal decomposition of a molecule by heat in the absence of oxygen. The gasification reactions are a set of reactions between carbon monoxide, carbon dioxide, water, and char that can be used to increase the amount of solid material that can be converted to desirable gaseous products.

The gas mixture resulting from pyrolysis and gasification is primarily carbon monoxide and hydrogen. This mixture is called synthesis gas because it is the raw material for ammonia synthesis and for methanol synthesis. The pyrolysis/gasification process is relatively insensitive to the type of biomass material being used, except that materials with a high silica content, such as rice hulls, are a problem in most gasifiers.

Typical yields from a gasification/methanol system are 0.365 pounds of methanol for each pound of biomass. This means that for most residues it is possible to make more methanol per pound than ethanol. Table 24 is a comparison of the production of ethanol and methanol from corn residues. It is apparent that the potential methanol is double the volume of the potential ethanol. A limiting factor in the assessment of methanol potential is the rule of thumb that the minimum economical size methanol facility must process 1000 dry tons per day, or about 330,000 tons per year of residues. It is evident that many counties can achieve that quantity of material with corn residues alone.

It is not always more advantageous to make methanol from the residues, however. Table 25 demonstrates that because of the relatively high sugar content in sorghum residues, it is preferable to convert them to ethanol instead of methanol.

The total methanol potential using gasification and methanol synthesis technologies with crop residues is shown in Table 26. Methanol can also be made from feedlot wastes, as summarized in Table 27. The state can be considerably more than self-sufficient in liquid fuels based on use of the residues alone, if methanol is determined to be an acceptable motor fuel. Based on energy content, one gallon of methanol is approximately equal to 0.77 gallon of ethanol or gasoline. Although it was not considered in this study, the same synthesis gas used to make methanol can be used to make synthetic gasoline. The net volumes of synthetic gasoline are somewhat smaller than the methanol yield.

8.3 Other Energy Uses for Crop Residues

Another option for gasification of crop residues and feedlot wastes is the use of anaerobic digestion to produce methane. This process has been hampered at the large commercial scale because of the large capital investment in fermentation tanks needed. However, anaerobic digestion is one of the few technologies that can be employed at a smaller scale to produce a synthetic natural gas. Manure, when digested, yields about 4.2 cubic feet of gas per pound of manure. The methane content of the gas is about 63%. Corn residue gives about 4 cubic feet of gas per pound, but the methane content is only 50%. In preparing Table 28 it was assumed that other grain residues will perform the same as corn residue. There apparently are no county-by-county data for natural gas consumption in Nebraska, but an estimate based upon household usage is given in Table 28. The total potential of 5,283 million cubic feet (methane equivalent) of synthetic natural gas is considerably less than the 1987 consumption of 91,098 million cubic feet. It appears that the impact of anaerobic digestion technologies should be minimal, except as a local utilization and/or waste treatment strategy.

All biomass materials can be burned. It was assumed that direct combustion of the crops themselves is not a strategy suitable for large scale application. However, direct combustion of residues in applications such as steam production and electrical power generation is feasible and is being used in a number of locations throughout the world.

Table 29 also shows the potential for direct combustion of

crop residues in electrical power production. Experience in Denmark suggests that there is about 80% efficiency in converting thermal energy of biomass to electrical power in commercial practice. The potential of 64,185 million kilowatt hours of electrical generating capacity using residues compares favorably with the total 1987 electrical usage in Nebraska of 16,770 million kilowatt hours. The estimated electrical power usage shown in Table 29 suggest that some counties could be self-sufficient in fuel for electrical power if the residues could be assembled and transported economically.

Summary

Nebraska has the potential to be relatively energy self-sufficient in liquid fuels and electrical power. This goal of sufficiency must be tested for economic viability before it is considered as a policy goal. The use of harvestable residues for a combination of methanol synthesis and electrical power generation appears to be highly attractive. The production of ethanol from excess corn, sorghum residues, and some contribution from sugar beets and other grains also is attractive. Feedlot wastes are not in sufficient quantity and concentration to have an impact of energy resources, unless the conversion is a part of a waste treatment strategy at a local scale.

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TABLE 1

COMMERCIAL AND NON-COMMERCIAL FOREST LAND
IN THE STATE OF NEBRASKA, ACRES

	ALL FORESTED ACRES	COMMERCIAL FORESTS	PERCENT COMMERCIAL FORESTS
NORTHWEST REPORTING DISTRICT			
BANNER	5507	3356	61
BOX	84	84	100
CHEYENNE	688	688	100
DAWES	56465	48064	85
DEUEL	282	282	100
GARDEN	823	748	91
KIMBALL	441	358	81
MORILL	6441	2746	43
SCOTTS	9396	4566	49
SHERIDAN	37128	31453	85
SIOUX	44921	35987	80
NORTH REPORTING DISTRICT			
ARTHUR	323	323	100
BLAINE	1399	1131	81
BOYD	11762	9251	79
BROWN	14682	10398	71
CHERRY	17322	12598	73
GARFIELD	1963	1556	79
GRANT	0	0	0
HOLT	27163	20461	75
HOOKER	935	781	84
KEYA	22449	15965	71
LOGAN	1216	881	72
LOUP	902	618	69
MCPHERSO	301	250	83
ROCK	5671	4305	76
THOMAS	4980	3424	69
WHEELER	2695	1981	74
NORTHEAST REPORTING DISTRICT			
ANTELOPE	12917	9889	77
BOONE	2954	2567	87
BURT	6026	4856	81
CEDAR	7915	5793	73
CUMING	6437	5473	85
DAKOTA	7841	5954	76
DIXON	10108	7845	78

TABLE 1. CONTINUED

	ALL FORESTED	COMMERCIAL	% COMML
KNOX	28630	21353	75
MADISON	3152	2294	73
PIERCE	3047	1931	63
STANTON	5712	3776	66
THURSTON	14166	11010	78
WAYNE	1787	1485	83
CENTRAL REPORTING DISTRICT			
BUFFALO	10721	6765	63
CUSTER	18822	13016	69
DAWSON	13840	6171	45
GREELEY	528	323	61
HALL	5271	3698	70
HOWARD	5523	3943	71
SHERMAN	3603	2117	59
VALLEY	1549	1037	67
EAST REPORTING DISTRICT			
BUTLER	4490	3560	79
CASS	16361	12390	76
COLFAX	4729	3507	74
DODGE	8294	6046	73
DOUGLAS	8444	6833	81
HAMILTON	2876	1960	68
LANCASTE	6803	4837	71
MERRICK	7911	4596	58
NANCE	10259	7673	75
PLATTE	4585	3805	83
POLK	3560	2406	68
SARPY	8673	668	8
SAUNDERS	10524	7167	68
SEWARD	5393	4287	79
WASHINGTON	13488	10674	79
YORK	1182	898	76
SOUTHWEST REPORTING DISTRICT			
CHASE	416	225	54
DUNDY	1635	1542	94
FRONTIER	3832	1430	37
HAYES	1096	920	84
HITCHCOCK	4227	2768	65
KEITH	3579	3555	99
LINCOLN	12199	9159	75
PERKINS	0	0	0
RED	3669	2971	81

TABLE 1. CONTINUED

	ALL FORESTED	COMMERCIAL	% COMML
SOUTH REPORTING DISTRICT			
ADAMS	2692	2285	85
FRANKLIN	4090	3487	85
FURNAS	5237	3329	64
GOSPER	697	477	68
HARLAN	4006	2934	73
KEARNEY	224	152	68
PHELPS	532	461	87
WEBSTER	7023	5910	84
SOUTHEAST REPORTING DISTRICT			
CLAY	2038	1678	82
FILLMORE	924	742	80
GAGE	9218	7716	84
JEFFERSON	13721	10775	79
JOHNSON	9734	7373	76
NEMAHA	11430	8363	73
NUCKOLLS	5475	4094	75
OTOE	10989	8714	79
PAWNEE	9696	6851	71
RICHARDS	13450	9851	73
SALINE	7371	5577	76
THAYER	5147	3620	70
SUMMARY TOTAL			
NEBRASKA	718407	531817	74

APPENDIX A

TABLES

TABLE 2. NON-IRRIGATED CROPS

	GRAIN/CORN EQUIVALENTS	FODDER/GRAIN RATIO	LBS. OF GRAIN PER BUSHEL
CORN	1.00	1.0	56
SOYBEANS	n/a	0.75	56
SORGHUM	0.93	1.0	57
WHEAT	n/a	1.67	58
ALFALFA	n/a	n/a	n/a
OATS	0.49	2.0	36
BARLEY	0.76	1.5	47
RYE	0.83	1.5	56

TABLE 3.

DISTRIBUTION OF NEBRASKA AGRICULTURAL LAND
BY SOIL CONSERVATION SERVICE LAND CAPABILITY CLASSIFICATION

	IRRIGATED ACRES BY CAPABILITY CLASS			NON-IRRIGATED ACRES BY CAPABILITY CLASS		
	ONE	TWO	THREE	ONE	TWO	THREE
NORTHWEST REPORTING DISTRICT						
BANNER	0	5000	1700	0	8200	126800
BOX	0	64000	12000	0	72500	136200
CHEYENNE	2300	14200	4700	0	282100	95200
DAWES	0	0	3200	0	47600	60100
DEUEL	0	22400	2500	0	123400	35000
GARDEN	0	0	3700	0	74100	44600
KIMBALL	5600	4200	8300	0	42100	218700
MORRILL	15900	30700	16900	0	27000	57300
SCOTTS	10900	19500	120400	0	0	23200
SHERIDAN	0	56900	12300	0	93100	62100
SIOUX	0	0	11900	0	5600	48300
NORTH REPORTING DISTRICT						
ARTHUR	0	0	0	0	0	0
BLAINE	0	4900	0	0	4900	5000
BOYD	0	1200	1300	600	57800	35400
BROWN	0	23600	7400	0	5000	2500
CHERRY	0	0	0	0	26500	26400
GARFIELD	2900	13700	7300	0	4200	0
GRANT	0	0	0	0	0	0
HOLT	6000	25700	40700	0	15200	11000
HOOVER	0	0	0	0	0	0
KEYA	0	4600	10800	0	11700	19300
LOGAN	0	11500	3900	0	5700	13900
LOUP	10600	5600	0	0	0	1200
MCPHERSON	0	0	0	0	0	0
ROCK	0	500	12100	0	1500	0
THOMAS	0	0	0	0	5000	0
WHEELER	0	0	0	0	2500	0
NORTHWEST REPORTING DISTRICT						
ANTELOPE	24500	32000	51700	9900	34600	57600
BOONE	32500	32400	8700	13400	32200	87000
BURT	16900	19300	30700	31400	52100	51800
CEDAR	2400	17400	8600	33400	79200	71700
CUMING	2400	14700	7300	22000	119600	95300
DAKOTA	2500	4900	3100	16100	14800	19300
DIXON	1200	9900	11100	6300	68100	44700

TABLE 3. CONTINUED

	ONE	TWO	THREE	ONE	TWO	THREE
KNOX	100	6100	1300	35100	93300	50100
MADISON	2700	18900	16300	18900	78700	100300
PIERCE	15500	10200	20500	12800	38400	76900
STANTON	5000	9900	10000	12400	42300	47300
THURSTON	4200	3300	2900	18900	35500	43600
WAYNE	5000	7400	9900	14900	57200	97000
CENTRAL REPORTING DISTRICT						
BUFFALO	82400	74900	10000	5000	32400	15000
CUSTER	0	129100	40100	0	67200	72400
DAWSON	175100	33600	27700	5300	24700	10400
GREELEY	3800	10100	5100	0	10200	10000
HALL	5300	138400	23000	0	30100	3900
HOWARD	31000	26000	13600	3800	24700	8500
SHERMAN	3700	24800	1200	0	23500	6200
VALLEY	3800	40100	18900	0	25100	11400
EAST REPORTING DISTRICT						
BUTLER	62200	27800	12800	63700	45800	37000
CASS	0	1200	2200	23300	106800	104300
COLFAX	4800	45500	11900	11900	59900	40600
DODGE	16600	54100	23500	25900	91900	54300
DOUGLAS	1300	1300	3900	7100	37500	26900
HAMILTON	159900	60100	14400	32400	14500	6000
LANCASTE	2600	2500	0	22500	90400	175900
MERRICK	17800	79400	51000	0	13800	6300
NANCE	16100	9300	7000	24800	52500	14300
PLATTE	12400	47200	59700	22400	69200	81500
POLK	99600	27200	7600	34700	17300	12400
SARPY	0	3700	1200	2000	33400	40500
SAUNDERS	11900	23900	24400	49100	66700	180400
SEWARD	31200	33700	24000	38400	53000	60600
WASHINGT	0	10300	5900	11400	65800	47100
YORK	130200	54100	30100	30100	20100	21300
SOUTHWEST REPORTING DISTRICT						
CHASE	27700	62300	47800	0	88600	26100
DUNDY	7500	16000	40700	0	65500	8800
FRONTIER	14600	68400	4900	0	175800	19400
HAYES	5700	16300	19500	0	93400	15400
HITCHCOC	19400	16100	3200	0	170800	14900
KEITH	5200	71900	7800	0	111600	17700
LINCOLN	39500	43700	57800	0	63300	71100
PERKINS	1600	75900	30300	0	177000	79300
RED	0	45000	5200	0	128700	50000

TABLE 3. CONTINUED

	ONE	TWO	THREE	ONE	TWO	THREE
SOUTH REPORTING DISTRICT						
ADAMS	101900	44300	12300	0	95300	13500
FRANKLIN	27000	40400	5000	2600	60000	1200
FURNAS	20100	17800	0	2600	151700	20200
GOSPER	21800	31700	0	0	59000	5400
HARLAN	24300	63200	2400	1300	77500	3700
KEARNEY	99800	30300	16900	1300	68300	13900
PHELPS	112800	54400	17200	0	40200	10400
WEBSTER	6000	22900	8500	1200	69500	43000
SOUTHEAST REPORTING DISTRICT						
CLAY	45000	102400	22500	7500	47400	20000
FILLMORE	2500	128400	30200	10000	103100	20100
GAGE	7300	19700	2500	12200	105800	93700
JEFFERSO	5000	27300	17200	2500	89100	64300
JOHNSON	0	1300	3700	3900	28700	69900
NEMAHA	0	2400	0	1200	76500	97200
NUCKOLLS	19900	35400	1200	23900	63700	52000
OTOE	0	2600	2600	2600	79800	147900
PAWNEE	0	0	0	2500	27400	85800
RICHARDS	0	0	2700	21300	78100	129200
SALINE	14400	65600	9600	9600	94400	60000
THAYER	12600	68600	18800	11200	80000	27400
SUMMARY TOTAL						
NEBRASKA	1682400	2627200	1272900	777300	5308400	4193500

TABLE 4.

TOTAL FARM ACRES, CLASS I, II, AND III ACRES AVAILABLE
AND ACRES TENTATIVELY ACCEPTED FOR THE CRP PROGRAM THROUGH
THE 9TH SIGNUP BY REPORTING DISTRICT AND COUNTY

	FARM ACRES	CLASS I, II, AND III	CRP ACRES	PERCENT CLASS I-III	PERCENT CRP ACRES
NORTHWEST REPORTING DISTRICT					
BANNER	211216	141700	53605	67	25
BOX	365732	284700	42999	78	12
CHEYENNE	536516	398500	25120	74	5
DAWES	175060	110900	34082	63	19
DEUEL	217076	183300	8825	84	4
GARDEN	159396	122400	11153	77	7
KIMBALL	445332	278900	111636	63	25
MORILL	194916	147800	21093	76	11
SCOTTS	185572	174000	16353	94	9
SHERIDAN	280672	224400	48085	80	17
SIOUX	112760	65800	13878	58	12
NORTH REPORTING DISTRICT					
ARTHUR	9104	0	2276	0	25
BLAINE	14712	14800	1851	101	13
BOYD	118224	96300	3022	81	3
BROWN	90656	38500	15920	42	18
CHERRY	64084	52900	15826	83	25
GARFIELD	33440	28100	6778	84	20
GRANT	3400	0	159	0	5
HOLT	325476	98600	22677	30	7
HOOKER	3092	0	773	0	25
KEYA	59792	46400	3909	78	7
LOGAN	46348	35000	3377	76	7
LOUP	22980	17400	1321	76	6
MCPHERSO	15748	0	3289	0	21
ROCK	91600	14100	21828	15	24
THOMAS	5264	5000	823	95	16
WHEELER	75040	2500	14154	3	19
NORTHEAST REPORTING DISTRICT					
ANTELOPE	360484	210300	15848	58	4
BOONE	276232	206200	21600	75	8
BURT	267908	202200	22352	75	8
CEDAR	333180	212700	21161	64	6
CUMING	290112	261300	4294	90	1
DAKOTA	118732	60700	17129	51	14
DIXON	220200	141300	43102	64	20

TABLE 4. CONTINUED

	FARM	I, II, III	CRP ACRES	% I - III	% CRP
KNOX	315824	186000	28816	59	9
MADISON	278860	235800	15920	85	6
PIERCE	257612	174300	16273	68	6
STANTON	186996	126900	24252	68	13
THURSTON	193544	108400	25567	56	13
WAYNE	225268	191400	29415	85	13
CENTRAL REPORTING DISTRICT					
BUFFALO	304904	219700	12641	72	4
CUSTER	376648	308800	13806	82	4
DAWSON	331212	276800	2382	84	1
GREELEY	143384	39200	10782	27	8
HALL	247224	200700	1435	81	1
HOWARD	172888	107600	9150	62	5
SHERMAN	134036	59400	16041	44	12
VALLEY	140404	99300	9999	71	7
EAST REPORTING DISTRICT					
BUTLER	302336	249300	10616	82	4
CASS	273128	237800	3415	87	1
COLFAX	206372	174600	1957	85	1
DODGE	282996	266300	1289	94	0
DOUGLAS	92412	78000	1209	84	1
HAMILTON	308316	287300	828	93	0
LANCASTE	342124	293900	26428	86	8
MERRICK	206020	168300	719	82	0
NANCE	181592	124000	12680	68	7
PLATTE	339032	292400	6323	86	2
POLK	222736	198800	454	89	0
SARPY	98228	80800	570	82	1
SAUNDERS	374152	356400	8353	95	2
SEWARD	289444	240900	9111	83	3
WASHINGT	191396	140500	6388	73	3
YORK	303492	285900	430	94	0
SOUTHWEST REPORTING DISTRICT					
CHASE	297956	252500	6207	85	2
DUNDY	213820	138500	16273	65	8
FRONTIER	230964	283100	1485	123	1
HAYES	177480	150300	16695	85	9
HITCHCOC	226472	224400	5358	99	2
KEITH	243308	214200	12706	88	5
LINCOLN	336092	275400	24097	82	7
PERKINS	495656	364100	43137	73	9
RED	263532	228900	3201	87	1

TABLE 4. CONTINUED

	FARM	I, II, III	CRP ACRES	% I - III	% CRP
SOUTH REPORTING DISTRICT					
ADAMS	278104	267300	3693	96	1
FRANKLIN	165908	136200	7923	82	5
FURNAS	292132	212400	25127	73	9
GOSPER	133340	117900	2623	88	2
HARLAN	185644	172400	3989	93	2
KEARNEY	269232	230500	1926	86	1
PHELPS	275852	230500	2414	84	1
WEBSTER	173564	151100	15358	87	9
SOUTHEAST REPORTING DISTRICT					
CLAY	271852	244800	1955	90	1
FILLMORE	315816	294300	1218	93	0
GAGE	389660	241200	37180	62	10
JEFFERSON	228988	205400	13802	90	6
JOHNSON	155232	107500	32247	69	21
NEMAHA	187480	177300	9979	95	5
NUCKOLLS	211132	196100	5176	93	2
OTOE	304088	235500	14975	77	5
PAWNEE	153140	115700	37640	76	25
RICHARDS	246528	231300	25260	94	10
SALINE	271732	253600	9733	93	4
THAYER	276432	218600	7097	79	3
SUMMARY TOTAL				AVG	AVG
NEBRASKA	20323772	15857200	1346021	58	6

TABLE 5.

NEBRASKA 1987 CROP PRODUCTION BY REPORTING DISTRICT
 ACRES PLANTED AS IRRIGATED CROPS
 SOURCE: NEBRASKA AG STATISTICS
 NATURAL RESOURCE COMMISSION DATABASE

		CORN	SORGHUM	SOYBEANS	ALFALFA
NORTHWEST REPORTING DISTRICT					
BANNER	1	3800	0	300	3600
BOX	2	33800	0	0	5900
CHEYENNE	3	9200	300	0	3700
DAWES	4	2300	0	0	6300
DEUEL	5	8800	100	0	600
GARDEN	6	13400	0	200	12400
KIMBALL	7	4400	100	0	2700
MORRILL	8	40400	0	0	13600
SCOTTS	9	47800	100	200	13800
SHERIDAN	10	20100	0	100	17300
SIOUX	11	7500	0	0	7100
NORTH REPORTING DISTRICT					
ARTHUR	12	4700	0	100	4500
BLAINE	13	3200	0	0	2900
BOYD	14	3000	100	400	500
BROWN	15	32400	0	700	4100
CHERRY	16	7100	0	0	11200
GARFIELD	17	10000	100	600	3500
GRANT	18	400	0	0	1300
HOLT	19	149600	100	9700	10200
HOOKER	20	200	0	0	2900
KEYA	21	2400	0	600	1100
LOGAN	22	12100	0	200	2700
LOUP	23	3300	0	500	2500
MCPHERSO	24	2300	0	0	1200
ROCK	25	23500	0	1700	2400
THOMAS	26	600	0	0	1800
WHEELER	27	28700	0	1200	1500
NORTHEAST REPORTING DISTRICT					
ANTELOPE	28	126800	0	21700	7000
BOONE	29	90000	0	6800	5600
BURT	30	25800	0	8800	300
CEDAR	31	38000	0	12400	2800
CUMING	32	17900	100	3900	1200
DAKOTA	33	8500	0	2500	0
DIXON	34	10800	0	3000	200
KNOX	35	23600	0	2900	3400

TABLE 5. CONTINUED

		CORN	SORGHUM	SOYBEANS	ALFALFA
MADISON	36	58100	0	11900	1200
PIERCE	37	72800	0	17600	3200
STANTON	38	18000	0	4500	1100
THURSTON	39	4300	0	1200	200
WAYNE	40	11900	0	1100	200
CENTRAL REPORTING DISTRICT					
BUFFALO	41	142400	400	24300	8800
CUSTER	42	128200	300	7300	12300
DAWSON	43	145500	400	13000	31300
GREELEY	44	44700	100	3500	2200
HALL	45	146500	400	12500	2100
HOWARD	46	74000	300	4200	2000
SHERMAN	47	41800	600	3000	3900
VALLEY	48	45400	100	9800	2400
EAST REPORTING DISTRICT					
BUTLER	49	70100	3700	15000	3200
CASS	50	2500	0	900	200
COLFAX	51	37300	0	13400	1700
DODGE	52	60400	1300	16400	300
DOUGLAS	53	7800	0	1900	400
HAMILTON	54	181100	4700	29200	1400
LANCASTE	55	7100	1800	900	300
MERRICK	56	119200	200	11200	2200
NANCE	57	35400	900	3000	900
PLATTE	58	93800	0	23300	1500
POLK	59	85500	3800	16100	1300
SARPY	60	4800	0	700	200
SAUNDERS	61	36900	400	15200	500
SEWARD	62	64700	7900	15900	300
WASHINGT	63	13500	0	10000	100
YORK	64	157900	2600	17500	900
SOUTHWEST REPORTING DISTRICT					
CHASE	65	88900	100	1700	3400
DUNDY	66	64100	100	1700	8600
FRONTIER	67	43500	1200	8600	1000
HAYES	68	21200	100	7600	1500
HITCHCOC	69	20200	200	1700	3300
KEITH	70	37000	100	2100	9300
LINCOLN	71	111000	100	4200	14100
PERKINS	72	82000	100	3000	2400
RED	73	36100	1400	3300	4300

TABLE 5. CONTINUED

		CORN	SORGHUM	SOYBEANS	ALFALFA
SOUTH REPORTING DISTRICT					
ADAMS	74	120700	8100	13400	1100
FRANKLIN	75	52700	5200	8500	1800
FURNAS	76	31700	1300	4900	2600
GOSPER	77	48300	300	4500	1500
HARLAN	78	47400	2100	5600	800
KEARNEY	79	132800	500	13600	2500
PHELPS	80	161800	200	12100	6900
WEBSTER	81	24600	3900	2800	700
SOUTHEAST REPORTING DISTRICT					
CLAY	82	113800	8900	22300	5300
FILLMORE	83	120200	6300	21500	1400
GAGE	84	26100	10900	5100	600
JEFFERSO	85	31600	4600	8400	500
JOHNSON	86	5400	3700	1500	0
NEMAHA	87	1400	1000	1100	100
NUCKOLLS	88	31900	2800	10400	800
OTOE	89	1200	2200	700	0
PAWNEE	90	700	500	200	0
RICHARDS	91	700	0	900	0
SALINE	92	44500	8200	8500	400
THAYER	93	70500	13000	13100	1000
SUMMARY TOTAL					
NEBRASKA		4300000	118000	576000	324000

TABLE 6.

NEBRASKA 1987 CROP PRODUCTION BY REPORTING DISTRICT
 ACRES PLANTED AS NON-IRRIGATED CROPS
 SOURCE: NEBRASKA AG STATISTICS
 NATURAL RESOURCE COMMISSION DATABASE

	CORN	SORGHUM	WHEAT	SOYBEANS
NORTHWEST REPORTING DISTRICT				
BANNER	500	700	46900	0
BOX	1200	100	79500	0
CHEYENNE	1200	300	172700	0
DAWES	300	400	39000	0
DEUEL	1000	1100	69600	0
GARDEN	1300	600	37000	0
KIMBALL	400	100	129400	0
MORRILL	2600	500	23400	0
SCOTTS	1200	100	9900	0
SHERIDAN	1800	500	47000	0
SIOUX	600	300	6900	0
NORTH REPORTING DISTRICT				
ARTHUR	0	0	500	0
BLAINE	500	0	200	0
BOYD	22000	6600	2400	1100
BROWN	1000	200	200	100
CHERRY	1400	300	1000	0
GARFIELD	1400	0	300	200
GRANT	0	0	100	0
HOLT	18500	500	3900	2000
HOOKER	0	0	0	0
KEYA	4300	200	1600	100
LOGAN	3800	0	4500	0
LOUP	2700	0	300	100
MCPHERSO	600	0	300	0
ROCK	1600	100	900	0
THOMAS	100	0	100	0
WHEELER	3000	0	100	200
NORTHEAST REPORTING DISTRICT				
ANTELOPE	52000	200	500	22500
BOONE	55200	2200	2900	15800
BURT	75500	500	2400	101400
CEDAR	88500	200	300	46500
CUMING	101400	500	300	73800
DAKOTA	36000	0	400	29000
DIXON	66200	100	200	35000
KNOX	74700	2900	1900	21600

TABLE 6. CONTINUED

	CORN	SORGHUM	WHEAT	SOYBEANS
MADISON	65500	100	400	54000
PIERCE	48600	200	400	31200
STANTON	48700	200	1000	32800
THURSTON	67600	200	300	39100
WAYNE	67200	100	500	52000

CENTRAL REPORTING DISTRICT

BUFFALO	9100	6800	13100	6900
CUSTER	31000	1000	25700	11900
DAWSON	3700	1300	6100	1400
GREELEY	22000	1700	1100	6300
HALL	6100	3000	3400	2700
HOWARD	12100	1500	4700	6500
SHERMAN	11400	3100	6000	5700
VALLEY	11400	1600	6100	7100

EAST REPORTING DISTRICT

BUTLER	39400	37600	8200	50000
CASS	69400	19700	18700	87000
COLFAX	47400	2500	3300	50400
DODGE	60400	4100	2000	65800
DOUGLAS	31300	100	600	35600
HAMILTON	4600	10400	2900	5200
LANCASTE	11300	119300	51700	46400
MERRICK	7600	600	2300	5000
NANCE	35300	8100	6300	12100
PLATTE	65200	1900	3900	49600
POLK	7400	27600	2600	17400
SARPY	32100	500	1000	34700
SAUNDERS	82200	18800	8900	101700
SEWARD	12300	63800	13200	29400
WASHINGT	54200	500	2300	61100
YORK	8300	29500	2800	11700

SOUTHWEST REPORTING DISTRICT

CHASE	8800	2100	43100	800
DUNDY	8700	8100	33000	700
FRONTIER	11600	18200	42700	9000
HAYES	16000	4200	41900	3100
HITCHCOC	8500	18200	71500	900
KEITH	3700	1700	62700	1400
LINCOLN	14500	1500	33900	1200
PERKINS	4800	1800	135100	1600
RED	10200	23200	63900	3500

TABLE 6. CONTINUED

	CORN	SORGHUM	WHEAT	SOYBEANS
SOUTH REPORTING DISTRICT				
ADAMS	4400	18100	28500	7200
FRANKLIN	1300	19700	21800	5600
FURNAS	15300	32200	62400	6800
GOSPER	2500	13300	14800	3900
HARLAN	2800	21700	33100	7200
KEARNEY	7000	11400	20000	7000
PHELPS	3300	5300	7900	3000
WEBSTER	1600	30300	36000	5400
SOUTHEAST REPORTING DISTRICT				
CLAY	2300	28200	13100	13100
FILLMORE	3100	42200	20500	17600
GAGE	5300	122700	54500	45600
JEFFERSO	2700	52800	32300	12600
JOHNSON	5000	37300	12200	17800
NEMAHA	44700	13400	15700	55800
NUCKOLLS	1300	52800	37900	9200
OTOE	58000	41500	24400	67100
PAWNEE	6500	44600	10100	19200
RICHARDS	43100	23300	13200	93400
SALINE	6300	65900	34400	18900
THAYER	1400	41300	43300	15300
SUMMARY TOTAL				
NEBRASKA	1900000	1182000	1950000	1724000

TABLE 7.

NEBRASKA 1987 CROP PRODUCTION BY REPORTING DISTRICT
ACRES PLANTED AS NON-IRRIGATED CROPSSOURCE: NEBRASKA AG STATISTICS
NATURAL RESOURCE COMMISSION DATABASE

	ALFALFA	OATS	BEETS	BARLEY
NORTHWEST REPORTING DISTRICT				
BANNER	1600	3900	600	5600
BOX	3900	3300	18050	7000
CHEYENNE	2400	9400	1470	5300
DAWES	35800	6400	0	3100
DEUEL	500	7300	0	6000
GARDEN	1700	3100	0	2700
KIMBALL	400	5200	0	13500
MORRILL	2600	1600	7630	400
SCOTTS	1000	600	29100	900
SHERIDAN	28100	8200	0	4100
SIOUX	5800	1500	3350	500
NORTH REPORTING DISTRICT				
ARTHUR	1500	0	0	0
BLAINE	4400	200	0	0
BOYD	24300	13400	0	1700
BROWN	3700	300	0	0
CHERRY	14900	500	0	100
GARFIELD	6700	500	0	0
GRANT	600	0	0	0
HOLT	34100	7200	0	0
HOOKER	200	0	0	0
KEYA	14400	1800	0	100
LOGAN	1000	300	0	0
LOUP	3800	700	0	0
MCPHERSO	800	0	0	0
ROCK	2000	300	0	0
THOMAS	500	100	0	0
WHEELER	2000	400	0	0
NORTHEAST REPORTING DISTRICT				
ANTELOPE	11500	5700	0	200
BOONE	20000	6900	0	100
BURT	8800	1800	0	100
CEDAR	32000	31100	0	3400
CUMING	16500	5600	0	100
DAKOTA	8100	5100	0	100
DIXON	8600	21000	0	200
KNOX	44700	39200	0	3200

TABLE 7. CONTINUED

	ALFALFA	OATS	BEETS	BARLEY
MADISON	7800	4700	0	0
PIERCE	12700	11100	0	100
STANTON	13200	5400	0	600
THURSTON	7500	15400	0	200
WAYNE	16200	8200	0	700
CENTRAL REPORTING DISTRICT				
BUFFALO	22500	1600	0	100
CUSTER	43700	6400	0	200
DAWSON	41600	1300	0	0
GREELEY	18100	1700	0	0
HALL	4400	600	0	0
HOWARD	15800	2000	0	200
SHERMAN	21900	2600	0	300
VALLEY	15000	1000	0	200
EAST REPORTING DISTRICT				
BUTLER	9200	2900	0	0
CASS	11200	1100	0	0
COLFAX	19900	6600	0	100
DODGE	15500	1600	0	0
DOUGLAS	4100	700	0	0
HAMILTON	2600	600	0	0
LANCASTE	16700	5300	0	0
MERRICK	6600	400	0	0
NANCE	9900	1900	0	0
PLATTE	11900	3200	0	0
POLK	3700	1000	0	0
SARPY	7400	400	0	0
SAUNDERS	15600	4000	0	0
SEWARD	10000	5200	0	0
WASHINGTON	13100	4500	0	0
YORK	5200	500	0	0
SOUTHWEST REPORTING DISTRICT				
CHASE	1900	2200	0	800
DUNDY	2200	1100	0	300
FRONTIER	2400	4000	0	300
HAYES	2800	4500	0	400
HITCHCOC	1400	2300	0	500
KEITH	3100	5000	0	1800
LINCOLN	21200	2200	0	300
PERKINS	200	7700	0	8000
RED	4900	2000	0	300

TABLE 7. CONTINUED

	ALFALFA	OATS	BEETS	BARLEY
SOUTH REPORTING DISTRICT				
ADAMS	3500	1400	0	0
FRANKLIN	2100	2400	0	0
FURNAS	10600	1700	0	400
GOSPER	2300	1600	0	0
HARLAN	4500	1700	0	300
KEARNEY	7400	500	0	0
PHELPS	3200	400	0	100
WEBSTER	6500	3300	0	0
SOUTHEAST REPORTING DISTRICT				
CLAY	2500	600	0	0
FILLMORE	5600	1200	0	0
GAGE	18100	4600	0	0
JEFFERSO	9800	2900	0	100
JOHNSON	9200	1900	0	0
NEMAHA	6700	1500	0	100
NUCKOLLS	4700	1600	0	100
OTOE	9600	1000	0	0
PAWNEE	5200	1200	0	100
RICHARDS	7300	900	0	0
SALINE	7600	3200	0	0
THAYER	7600	900	0	0
NEBRASKA	926000	360000	60200	75000

TABLE 8.

NEBRASKA 1987 CROP PRODUCTION BY REPORTING DISTRICT
 IRRIGATED - BUSHELS PER ACRE (UNLESS NOTED)
 SOURCE: NEBRASKA AG STATISTICS
 NATURAL RESOURCE COMMISSION DATABASE

	CORN	SORGHUM	SOYBEANS	ALFALFA
NORTHWEST REPORTING DISTRICT				
BANNER	130	0	29	4.2
BOX	142	0	0	4.9
CHEYENNE	132	70	0	4.6
DAWES	120	0	0	3.4
DEUEL	156	70	0	4.8
GARDEN	130	0	29	4.3
KIMBALL	96	70	0	4.2
MORRILL	129	0	0	4.6
SCOTTS	108	70	29	4.6
SHERIDAN	125	0	29	4.3
SIOUX	128	0	0	3
NORTH REPORTING DISTRICT				
ARTHUR	128	0	40	4.2
BLAINE	127	0	0	3.7
BOYD	122	79	40	4
BROWN	142	0	40	4
CHERRY	123	0	0	4.1
GARFIELD	130	79	40	3.9
GRANT	120	0	0	4
HOLT	144	79	40	4.4
HOOKER	120	0	0	4.3
KEYA	126	0	40	4
LOGAN	155	0	40	4.2
LOUP	130	0	40	4.1
MCPHERSO	121	0	0	4.1
ROCK	123	0	40	4.3
THOMAS	124	0	0	4.1
WHEELER	142	0	40	3.7
NORTHEAST REPORTING DISTRICT				
ANTELOPE	141	0	39	5.4
BOONE	134	0	36	4.9
BURT	132	0	42	4.6
CEDAR	128	0	40	5.3
CUMING	144	94	43	4.6
DAKOTA	144	0	43	0
DIXON	134	0	42	5
KNOX	120	0	39	5.1

TABLE 8. CONTINUED

	CORN	SORGHUM	SOYBEANS	ALFALFA
MADISON	137	0	37	4.8
PIERCE	137	0	38	5.3
STANTON	131	0	35	4.8
THURSTON	122	0	41	4.8
WAYNE	130	0	43	5.2
CENTRAL REPORTING DISTRICT				
BUFFALO	158	86	51	5
CUSTER	152	86	43	4.8
DAWSON	165	86	47	4.7
GREELEY	138	86	43	4.9
HALL	158	86	46	4.6
HOWARD	146	86	39	4.5
SHERMAN	131	86	40	5.1
VALLEY	136	86	42	4.5
EAST REPORTING DISTRICT				
BUTLER	144	98	42	4.7
CASS	128	0	42	4.5
COLFAX	133	0	37	4.8
DODGE	133	88	39	4.7
DOUGLAS	136	0	42	4.8
HAMILTON	159	105	45	4.5
LANCASTE	128	100	41	4.5
MERRICK	144	92	39	4.1
NANCE	135	93	41	4.7
PLATTE	137	0	37	4.7
POLK	150	97	42	4.3
SARPY	135	0	43	4.8
SAUNDERS	132	99	37	4.5
SEWARD	148	99	45	4.6
WASHINGT	137	0	41	4.7
YORK	160	99	45	4.6
SOUTHWEST REPORTING DISTRICT				
CHASE	170	104	41	4.8
DUNDY	167	104	43	4.84
FRONTIER	146	104	44	4.4
HAYES	135	104	40	4.6
HITCHCOC	150	104	41	4.9
KEITH	165	104	38	4.4
LINCOLN	155	104	42	4.6
PERKINS	162	104	43	4.8
RED	136	104	42	4.6

TABLE 8. CONTINUED

	CORN	SORGHUM	SOYBEANS	ALFALFA
SOUTH REPORTING DISTRICT				
ADAMS	154	105	48	4.5
FRANKLIN	150	105	50	4.8
FURNAS	140	97	46	5.1
GOSPER	158	98	49	4.9
HARLAN	150	95	51	5
KEARNEY	157	104	49	4.6
PHELPS	161	99	48	4
WEBSTER	149	102	47	4.8
SOUTHEAST REPORTING DISTRICT				
CLAY	154	97	47	4
FILLMORE	152	94	47	4.3
GAGE	130	101	41	4.2
JEFFERSO.	134	104	42	4.6
JOHNSON	149	102	42	0
NEMAHA	157	92	43	4
NUCKOLLS	152	104	46	4.4
OTOE	140	102	41	0
PAWNEE	135	97	39	0
RICHARDS	150	0	40	0
SALINE	140	102	43	4.8
THAYER	148	101.7	47	4.9

TABLE 9.

NEBRASKA 1987 CROP PRODUCTION BY REPORTING DISTRICT
 NON-IRRIGATED - BUSHEL PER ACRE (UNLESS NOTED)
 SOURCE: NEBRASKA AG STATISTICS
 NATURAL RESOURCE COMMISSION DATABASE

	CORN	SORGHUM	WHEAT	SOYBEANS
NORTHWEST CROP REPORTING DISTRICT				
BANNER	46	38	38.3	0
BOX	46	38	41.7	0
CHEYENNE	46	38	48.5	0
DAWES	46	38	43.3	0
DEUEL	46	38	50.3	0
GARDEN	46	38	49.1	0
KIMBALL	46	38	33.5	0
MORRILL	46	38	47.5	0
SCOTTS	46	38	33.3	0
SHERIDAN	46	38	41.4	0
SIOUX	46	38	43.6	0
NORTH REPORTING DISTRICT				
ARTHUR	0	0	38.6	0
BLAINE	55	0	35.5	0
BOYD	60	67	35.9	27
BROWN	60	67	35.5	27
CHERRY	43	67	38.6	0
GARFIELD	63	0	40.7	27
GRANT	0	0	34	0
HOLT	66	67	36.3	27
HOOKER	0	0	0	0
KEYA	47	67	39	27
LOGAN	82	0	39	0
LOUP	60	0	40.7	27
MCPHERSO	55	0	40.7	0
ROCK	55	67	40.7	0
THOMAS	58	0	34	0
WHEELER	70	0	37	27
NORTHEAST REPORTING DISTRICT				
ANTELOPE	70	69	41.4	26
BOONE	78	69	41.8	27
BURT	115	69	41	36
CEDAR	83	69	40.3	29
CUMING	108	69	40.3	36
DAKOTA	110	0	40	35
DIXON	93	69	39	32
KNOX	71	69	40.3	27

TABLE 9. CONTINUED

	CORN	SORGHUM	WHEAT	SOYBEANS
MADISON	87	69	42	28
PIERCE	82	69	42	28
STANTON	87	69	39.4	28
THURSTON	98	69	39	35
WAYNE	98	69	39	33
CENTRAL REPORTING DISTRICT				
BUFFALO	82	68	43.2	35
CUSTER	80	62	45.8	29
DAWSON	80	61	43.7	32
GREELEY	65	64	39.1	29
HALL	70	75	43.4	28
HOWARD	80	77	39.2	27
SHERMAN	70	61	41.6	29
VALLEY	69	64	44.9	31
EAST REPORTING DISTRICT				
BUTLER	90	87	40.5	33
CASS	112	82	42.3	34
COLFAX	95	81	43.2	31
DODGE	112	82	39.9	36
DOUGLAS	122	87	40.3	38
HAMILTON	94	88	47.1	37
LANCASTE	92	81	41.2	33
MERRICK	75	79	42.2	28
NANCE	85	79	46.5	29
PLATTE	92	90	44.3	31
POLK	115	89	45.1	37
SARPY	122	87	45.4	37
SAUNDERS	98	85	40.9	30
SEWARD	95	85	43.2	36
WASHINGT	123	89	41.3	38
YORK	107	91	47.7	38
SOUTHWEST REPORTING DISTRICT				
CHASE	60	57	48.9	22
DUNDY	54	52	47.9	22
FRONTIER	72	67	45.5	22
HAYES	60	58	47.6	22
HITCHCOC	52	59	43.4	22
KEITH	52	42	45.7	22
LINCOLN	65	52	39.9	22
PERKINS	55	41	42.3	22
RED	68	66	45.2	22

TABLE 9. CONTINUED

	CORN	SORGHUM	WHEAT	SOYBEANS
SOUTH REPORTING DISTRICT				
ADAMS	90	92	51.3	36
FRANKLIN	83	93	48.3	35
FURNAS	86	81	46.6	25
GOSPER	70	86	46.7	30
HARLAN	94	88	48.1	33
KEARNEY	89	91	48.7	37
PHELPS	94	91	47	32
WEBSTER	82	82	50.1	34
SOUTHEAST REPORTING DISTRICT				
CLAY	86	91	46.8	34
FILLMORE	102	87	45.3	35
GAGE	82	84	39.5	33
JEFFERSO	83	83	44.6	32
JOHNSON	82	81	40	33
NEMAHA	105	88	40	34
NUCKOLLS	85	86	48.8	32
OTOE	104	82	39.6	33
PAWNEE	85	80	34.3	34
RICHARDS	111	81	36	35
SALINE	85	85	44.2	36
THAYER	81	87	44.6	35

TABLE 10.

NEBRASKA 1987 CROP PRODUCTION BY REPORTING DISTRICT
NON-IRRIGATED - BUSHELS PER ACRE (UNLESS NOTED)SOURCE: NEBRASKA AG STATISTICS
NATURAL RESOURCE COMMISSION DATABASE

	ALFALFA	OATS	BEETS	BARLEY
NORTHWEST CROP REPORTING DISTRICT				
BANNER	2	39	18.3	28
BOX	1.6	56	19.8	35
CHEYENNE	1.9	63	18.2	34
DAWES	1.7	35	0	35
DEUEL	2	72	0	44
GARDEN	2	56	0	42
KIMBALL	2	41	0	27.3
MORRILL	1.8	50	18.3	38
SCOTTS	2.5	52	17.4	38
SHERIDAN	2	43	0	35
SIOUX	1.3	34	18.3	30
NORTH REPORTING DISTRICT				
ARTHUR	1.7	0	0	0
BLAINE	2	31	0	0
BOYD	2.2	34	0	27
BROWN	1.9	30	0	0
CHERRY	1.4	33	0	27
GARFIELD	2.1	36	0	0
GRANT	1.8	0	0	0
HOLT	1.7	30	0	0
HOOKER	1.8	0	0	0
KEYA	1.9	30	0	27
LOGAN	2.1	44	0	0
LOUP	2	35	0	0
MCPHERSO	1.7	0	0	0
ROCK	1.6	30	0	0
THOMAS	1.8	34	0	0
WHEELER	2.2	38	0	0
NORTHEAST REPORTING DISTRICT				
ANTELOPE	3.5	42	0	41
BOONE	3.4	58	0	41
BURT	4	53	0	41
CEDAR	3.3	49	0	41
CUMING	4.3	55	0	41
DAKOTA	3.6	49	0	41
DIXON	3.4	52	0	41
KNOX	3	44	0	41

TABLE 10. CONTINUED

	ALFALFA	OATS	BEETS	BARLEY
MADISON	3.7	49	0	0
PIERCE	3.5	50	0	41
STANTON	4	46	0	41
THURSTON	4.2	43	0	41
WAYNE	4.2	62	0	41
CENTRAL REPORTING DISTRICT				
BUFFALO	2.9	40	0	34
CUSTER	3	50	0	34
DAWSON	4	55	0	0
GREELEY	2.5	44	0	0
HALL	3.2	48	0	0
HOWARD	3.4	45	0	34
SHERMAN	2.9	44	0	34
VALLEY	3.2	52	0	34
EAST REPORTING DISTRICT				
BUTLER	3.6	49	0	0
CASS	4	52	0	0
COLFAX	3.9	59	0	45
DODGE	4.1	59	0	0
DOUGLAS	3.4	44	0	0
HAMILTON	3.5	48	0	0
LANCASTE	3.3	44	0	0
MERRICK	2.9	48	0	0
NANCE	3.3	55	0	0
PLATTE	4	58	0	0
POLK	3.5	56	0	0
SARPY	3.9	55	0	0
SAUNDERS	3.6	55	0	0
SEWARD	3.6	40	0	0
WASHINGT	4	54	0	0
YORK	4.1	50	0	0
SOUTHWEST REPORTING DISTRICT				
CHASE	2	49	0	40
DUNDY	2.9	51	0	37
FRONTIER	2.8	44	0	41
HAYES	3	51	0	38
HITCHCOC	3.1	52	0	40
KEITH	1.9	50	0	43
LINCOLN	3	37	0	36
PERKINS	2	48	0	46
RED	3.1	49	0	40

TABLE 10. CONTINUED

	ALFALFA	OATS	BEETS	BARLEY
SOUTH REPORTING DISTRICT				
ADAMS	3.8	41	0	0
FRANKLIN	4	46	0	0
FURNAS	3.4	37	0	33
GOSPER	3.9	46	0	0
HARLAN	4	50	0	33
KEARNEY	3.8	48	0	0
PHELPS	3.8	48	0	33
WEBSTER	3.5	48	0	0
SOUTHEAST REPORTING DISTRICT				
CLAY	3.8	48	0	0
FILLMORE	3.5	50	0	0
GAGE	4	50	0	0
JEFFERSO	4.1	52	0	40
JOHNSON	3.3	47	0	0
NEMAHA	3.9	59	0	40
NUCKOLLS	3.6	58	0	40
OTOE	3.9	40	0	0
PAWNEE	3.8	38	0	40
RICHARDS	4.2	50	0	0
SALINE	3.3	48	0	0
THAYER	4.2	48	0	0

TABLE 11.

RESIDUES AVAILABLE FOR CONVERSION TO METHANOL,
SYNTHETIC NATURAL GAS, OR DIRECT HEAT

	TOTAL CORN RESIDUE POUNDS	TOTAL SORGHUM RESIDUE POUNDS	TOTAL WHEAT RESIDUE POUNDS	TOTAL BARLEY RESIDUE POUNDS	TOTAL FEEDLOT MANURE TONS
NORTHWEST REPORTING DISTRICT					
BANNER	16213120	849072	24902737	24902737	3675
BOX	152246528	121296	163387355	163387355	8575
CHEYENNE	42194880	1034208	454311528	454311528	7679
DAWES	1514688	485184	91595088	91595088	0
DEUEL	44493568	1557696	189887731	189887731	0
GARDEN	3760848	727776	98537808	98537808	7652
KIMBALL	17135104	344736	95530878	95530878	0
MORRILL	183267056	606480	60287760	60287760	17303
SCOTTS	119773248	43092	2235163	2235163	35922
SHERIDAN	81388608	606480	105540192	105540192	2756
SIOUX	4628736	363888	11765198	11765198	4288
NORTH REPORTING DISTRICT					
ARTHUR	0	0	0	0	0
BLAINE	13607104	0	385104	385104	1269
BOYD	46890256	14115024	4673318	4673318	289
BROWN	111094368	427728	385104	385104	8110
CHERRY	1887872	641592	2093664	2093664	0
GARFIELD	46489632	252168	662270	662270	3369
GRANT	0	0	0	0	0
HOLT	205214352	133665	959845	959845	18234
HOOKER	0	0	0	0	175
KEYA	15821120	427728	3384576	3384576	0
LOGAN	66035536	0	4706676	4706676	613
LOUP	17099040	0	0	0	613
MCPHERSO	0	0	0	0	0
ROCK	10349976	0	0	0	3063
THOMAS	181888	0	184416	184416	0
WHEELER	5488000	0	0	0	15313
NORTHEAST REPORTING DISTRICT					
ANTELOPE	410665864	55062	140346	140346	15441
BOONE	434109424	605682	821872	821872	8475
BURT	424882528	0	0	0	9397
CEDAR	338291296	55062	81970	81970	3797

TABLE 11. CONTINUED

	TOTAL CORN RESIDUE	TOTAL SORGHUM RESIDUE	TOTAL WHEAT RESIDUE	TOTAL BARLEY RESIDUE	TOTAL FEEDLOT MANURE
CUMING	442439424	175161	81970	81970	61704
DAKOTA	159536944	0	0	0	1838
DIXON	244309296	27531	52884	52884	6173
KNOX	209899536	6387192	4153157	4153157	8294
MADISON	296050552	27531	113904	113904	3894
PIERCE	271277720	55062	113904	113904	3329
STANTON	209265672	55062	267132	267132	17420
THURSTON	207247264	0	0	0	1389
WAYNE	271582304	27531	132210	132210	2580

CENTRAL REPORTING DISTRICT

BUFFALO	834260672	14897064	30695501	30695501	13111
CUSTER	688866304	2081982	58626931	58626931	2841
DAWSON	952697200	3726660	14458757	14458757	53038
GREELEY	90364624	0	0	0	3084
HALL	733706400	7319256	8003654	8003654	5525
HOWARD	336985152	3686760	9993178	9993178	7098
SHERMAN	146524112	6036072	8207597	8207597	0
VALLEY	216750912	3302922	12511744	12511744	7461

EAST REPORTING DISTRICT

BUTLER	525784896	67993191	2251638	2251638	3460
CASS	269683456	6445446	5363048	5363048	1991
COLFAX	310656080	807975	966557	966557	14186
DODGE	504116704	1797894	541044	541044	6475
DOUGLAS	141096480	34713	163940	163940	1499
HAMILTON	1119283088	52269000	9260802	9260802	6433
LANCASTE	63833280	163437183	14441671	14441671	782
MERRICK	489328896	1586424	1859754	1859754	14241
NANCE	238900480	20425608	15889608	15889608	1194
PLATTE	492012528	682290	1171381	1171381	11139
POLK	536099200	96210870	795023	795023	21858
SARPY	140971432	173565	307812	307812	10904
SAUNDERS	451427200	6534024	2467988	2467988	14866
SEWARD	382298000	142748634	3866227	3866227	5114
WASHINGT	266028448	177555	644032	644032	5595
YORK	990415440	101239866	2490226	2490226	5646

SOUTHWEST REPORTING DISTRICT

CHASE	527420320	3862320	114315682	114315682	8631
DUNDY	174203232	13444704	85737168	85737168	1059
FRONTIER	242070976	42906864	105380184	105380184	0
HAYES	125890800	7817208	108178426	108178426	6738

TABLE 11. CONTINUED

	TOTAL CORN RESIDUE	TOTAL SORGHUM RESIDUE	TOTAL WHEAT RESIDUE	TOTAL BARLEY RESIDUE	TOTAL FEEDLOT MANURE
HITCHCOC	131696320	34939632	168312144	168312144	788
KEITH	204213184	2611056	155418754	155418754	3675
LINCOLN	498867040	2531256	73365566	73365566	6249
PERKINS	406893648	2397192	309966955	309966955	674
RED	175716352	53232984	156660307	156660307	4942
SOUTH REPORTING DISTRICT					
ADAMS	718361952	80301144	79301592	79301592	16004
FRANKLIN	283882480	73562832	57111466	57111466	1776
FURNAS	204253952	83253744	157721242	157721242	1838
GOSPER	271812800	36510096	37488518	37488518	1838
HARLAN	260758400	67322472	86356046	86356046	3369
KEARNEY	785497832	33321288	52829760	52829760	10241
PHELPS	969030272	15474018	20139312	20139312	26628
WEBSTER	126841792	83174742	91645124	91645124	1838
SOUTHEAST REPORTING DISTRICT					
CLAY	611675232	101612931	29255429	29255429	22509
FILLMORE	588333984	119553966	50369976	50369976	7212
GAGE	130880960	199556259	10203561	10203561	3189
JEFFERSON	146698160	141795024	59509958	59509958	3397
JOHNSON	23600360	34225821	3308640	3308640	1607
NEMAHA	155068928	4705008	4257840	4257840	2094
NUCKOLLS	180104400	163433592	68819712	68819712	1030
OTOE	196551936	16467528	6551107	6551107	3422
PAWNEE	18992400	23620800	2348795	2348795	3232
RICHARDS	168977088	7530327	3221856	3221856	2753
SALINE	232169840	205497768	37369597	37369597	1769
THAYER	346275552	119966931	83368372	83368372	5930
NEBRASKA	24955164528	2508453150	3744866963	3744866963	654593

TABLE 12.

NET VOLUME OF GROWING STOCK ON COMMERCIAL
FOREST LAND BY COUNTY AND SPECIES (THOUSAND CUBIC FEET)

	COTTONWOOD	BUR OAK	GREEN ASH	PONDEROSA PINE
NORTHWEST REPORTING DISTRICT				
BANNER	0	0	0	3050
BOX	35	0	10	0
CHEYENNE	147	0	42	0
DAWES	2009	101	149	49846
DEUEL	116	0	19	0
GARDEN	263	4	5	215
KIMBALL	0	0	0	397
MORILL	764	0	95	109
SCOTTS	1201	4	70	146
SHERIDAN	802	143	133	33319
SIOUX	798	201	127	40608
NORTH REPORTING DISTRICT				
ARTHUR	282	8	12	0
BLAINE	530	211	104	994
BOYD	2477	522	425	2143
BROWN	1746	881	355	3367
CHERRY	2564	808	356	5483
GARFIELD	600	145	64	407
GRANT	0	0	0	0
HOLT	5856	1632	883	4324
HOOKER	252	115	49	106
KEYA	2465	1121	439	6025
LOGAN	90	85	26	231
LOUP	267	94	58	502
MCPHERSO	79	33	14	63
ROCK	1179	454	195	1063
THOMAS	293	125	52	3229
WHEELER	1058	365	171	157
NORTHEAST REPORTING DISTRICT				
ANTELOPE	3930	1178	630	1206
BOONE	541	440	211	0
BURT	1230	992	302	0
CEDAR	890	1184	369	0
CUMING	2848	632	425	0
DAKOTA	1657	1165	465	0
DIXON	819	1857	426	0

TABLE 12. CONTINUED

	COTTONWOOD	BUR OAK	GREEN ASH	PONDEROSA
KNOX	6474	2178	1059	3957
MADISON	785	206	160	0
PIERCE	545	83	99	0
STANTON	1214	149	394	0
THURSTON	3106	1840	509	0
WAYNE	359	372	91	0
CENTRAL REPORTING DISTRICT				
BUFFALO	3369	201	371	0
CUSTER	3105	1384	962	0
DAWSON	2348	247	184	0
GREELEY	81	17	15	0
HALL	2112	136	206	0
HOWARD	1321	317	263	0
SHERMAN	929	153	126	0
VALLEY	327	51	61	0
EAST REPORTING DISTRICT				
BUTLER	1575	390	255	0
CASS	5297	1288	1130	0
COLFAX	1162	378	245	0
DODGE	3244	289	457	0
DOUGLAS	1570	1613	402	0
HAMILTON	764	162	121	0
LANCASTE	2272	457	379	0
MERRICK	2222	257	182	0
NANCE	3478	635	534	0
PLATTE	2083	379	283	0
POLK	1043	179	250	0
SARPY	1283	1590	370	0
SAUNDERS	3635	297	392	0
SEWARD	1845	436	320	0
WASHINGT	2134	2921	582	0
YORK	426	47	62	0
SOUTHWEST REPORTING DISTRICT				
CHASE	166	4	6	0
DUNDY	851	105	87	64
FRONTIER	374	248	68	0
HAYES	206	14	39	275
HITCHCOC	921	428	255	0
KEITH	1956	52	174	0
LINCOLN	2428	126	284	415
PERKINS	0	0	0	0
RED	1631	222	218	0

TABLE 12. CONTINUED

	COTTONWOOD	BUR OAK	GREEN ASH	PONDEROSA
SOUTH REPORTING DISTRICT				
ADAMS	696	369	202	0
FRANKLIN	937	611	288	0
FURNAS	1729	186	207	0
GOSPER	150	37	29	0
HARLAN	1020	251	205	0
KEARNEY	51	3	9	0
PHELPS	148	118	25	0
WEBSTER	2641	604	612	0
SOUTHEAST REPORTING DISTRICT				
CLAY	523	289	134	0
FILLMORE	264	60	96	0
GAGE	1561	1520	759	0
JEFFERSO	3234	1341	1257	0
JOHNSON	2870	704	584	0
NEMAHA	2764	839	573	0
NUCKOLLS	2334	289	265	0
OTOE	3930	1032	590	0
PAWNEE	3514	400	474	0
RICHARDS	3408	866	688	0
SALINE	2773	507	396	0
THAYER	1242	190	231	0
SUMMARY TOTAL				
NEBRASKA	142218	44567	25900	161701

TABLE 13.

ESTIMATED USE OF COMMERCIAL TIMBER PRODUCTS
FOR THE MAJOR SPECIES BY COUNTY (THOUSAND CUBIC FEET)

	COTTONWOOD		BUR OAK	
	SAW LOGS	FUEL WOOD	SAW LOGS	FUEL WOOD
NORTHWEST REPORTING DISTRICT				
BANNER	0.0	0.0	0.0	0.0
BOX	0.6	0.1	0.0	0.0
CHEYENNE	2.6	0.6	0.0	0.0
DAWES	35.0	7.9	0.2	10.7
DEUEL	2.0	0.5	0.0	0.0
GARDEN	4.6	1.0	0.0	0.4
KIMBALL	0.0	0.0	0.0	0.0
MORILL	13.3	3.0	0.0	0.0
SCOTTS	20.9	4.7	0.0	0.4
SHERIDAN	14.0	3.1	0.2	15.1
SIOUX	13.9	3.1	0.3	21.3
NORTH REPORTING DISTRICT				
ARTHUR	4.9	1.1	0.0	0.8
BLAINE	9.2	2.1	0.3	22.3
BOYD	43.1	9.7	0.9	55.2
BROWN	30.4	6.8	1.4	93.2
CHERRY	44.6	10.1	1.3	85.4
GARFIELD	10.4	2.4	0.2	15.3
GRANT	0.0	0.0	0.0	0.0
HOLT	102.0	23.0	2.7	172.6
HOOKER	4.4	1.0	0.2	12.2
KEYA	42.9	9.7	1.8	118.5
LOGAN	1.6	0.4	0.1	9.0
LOUP	4.6	1.0	0.2	9.9
MCPHERSO	1.4	0.3	0.1	3.5
ROCK	20.5	4.6	0.7	48.0
THOMAS	5.1	1.1	0.2	13.2
WHEELER	18.4	4.1	0.6	38.6
NORTHEAST REPORTING DISTRICT				
ANTELOPE	68.4	15.4	1.9	124.6
BOONE	9.4	2.1	0.7	46.5
BURT	21.4	4.8	1.6	104.9
CEDAR	15.5	3.5	1.9	125.2
CUMING	49.6	11.2	1.0	66.8
DAKOTA	28.8	6.5	1.9	123.2
DIXON	14.3	3.2	3.0	196.4

TABLE 13. CONTINUED

	SAW LOGS	FUEL WOOD	SAW LOGS	FUEL WOOD
KNOX	112.7	25.4	3.6	230.3
MADISON	13.7	3.1	0.3	21.8
PIERCE	9.5	2.1	0.1	8.8
STANTON	21.1	4.8	0.2	15.8
THURSTON	54.1	12.2	3.0	194.6
WAYNE	6.3	1.4	0.6	39.3
CENTRAL REPORTING DISTRICT				
BUFFALO	58.7	13.2	0.3	21.3
CUSTER	54.1	12.2	2.3	146.4
DAWSON	40.9	9.2	0.4	26.1
GREELEY	1.4	0.3	0.0	1.8
HALL	36.8	8.3	0.2	14.4
HOWARD	23.0	5.2	0.5	33.5
SHERMAN	16.2	3.6	0.3	16.2
VALLEY	5.7	1.3	0.1	5.4
EAST REPORTING DISTRICT				
BUTLER	27.4	6.2	0.6	41.2
CASS	92.2	20.8	2.1	136.2
COLFAX	20.2	4.6	0.6	40.0
DODGE	56.5	12.7	0.5	30.6
DOUGLAS	27.3	6.2	2.6	170.6
HAMILTON	13.3	3.0	0.3	17.1
LANCASTE	39.6	8.9	0.7	48.3
MERRICK	38.7	8.7	0.4	27.2
NANCE	60.6	13.6	1.0	67.2
PLATTE	36.3	8.2	0.6	40.1
POLK	18.2	4.1	0.3	18.9
SARPY	22.3	5.0	2.6	168.1
SAUNDERS	63.3	14.2	0.5	31.4
SEWARD	32.1	7.2	0.7	46.1
WASHINGT	37.2	8.4	4.8	308.9
YORK	7.4	1.7	0.1	5.0
SOUTHWEST REPORTING DISTRICT				
CHASE	2.9	0.7	0.0	0.4
DUNDY	14.8	3.3	0.2	11.1
FRONTIER	6.5	1.5	0.4	26.2
HAYES	3.6	0.8	0.0	1.5
HITCHCOC	16.0	3.6	0.7	45.3
KEITH	34.1	7.7	0.1	5.5
LINCOLN	42.3	9.5	0.2	13.3
PERKINS	0.0	0.0	0.0	0.0
RED	28.4	6.4	0.4	23.5

TABLE 13. CONTINUED

	SAW LOGS	FUEL WOOD	SAW LOGS	FUEL WOOD
SOUTH REPORTING DISTRICT				
ADAMS	12.1	2.7	0.6	39.0
FRANKLIN	16.3	3.7	1.0	64.6
FURNAS	30.1	6.8	0.3	19.7
GOSPER	2.6	0.6	0.1	3.9
HARLAN	17.8	4.0	0.4	26.5
KEARNEY	0.9	0.2	0.0	0.3
PHELPS	2.6	0.6	0.2	12.5
WEBSTER	46.0	10.4	1.0	63.9
SOUTHEAST REPORTING DISTRICT				
CLAY	9.1	2.1	0.5	30.6
FILLMORE	4.6	1.0	0.1	6.3
GAGE	27.2	6.1	2.5	160.7
JEFFERSO	56.3	12.7	2.2	141.8
JOHNSON	50.0	11.3	1.2	74.4
NEMAHA	48.1	10.8	1.4	88.7
NUCKOLLS	40.6	9.1	0.5	30.6
OTOE	68.4	15.4	1.7	109.1
PAWNEE	61.2	13.8	0.7	42.3
RICHARDS	59.3	13.4	1.4	91.6
SALINE	48.3	10.9	0.8	53.6
THAYER	21.6	4.9	0.3	20.1
SUMMARY TOTAL				
NEBRASKA	2476.0	557.5	73.1	4713.0

TABLE 14.

ESTIMATED USE OF COMMERCIAL TIMBER PRODUCTS
FOR THE MAJOR SPECIES BY COUNTY (THOUSAND CUBIC FEET)

	GREEN ASH		PONDEROSA PINE	
	SAW LOGS	FUEL WOOD	SAW LOGS	FUEL WOOD
NORTHWEST REPORTING DISTRICT				
BANNER	0.0	0.0	6.6	0.4
BOX	0.0	0.7	0.0	0.0
CHEYENNE	0.0	2.7	0.0	0.0
DAWES	0.0	9.7	107.2	6.5
DEUEL	0.0	1.2	0.0	0.0
GARDEN	0.0	0.3	0.5	0.0
KIMBALL	0.0	0.0	0.9	0.1
MORILL	0.0	6.2	0.2	0.0
SCOTTS	0.0	4.6	0.3	0.0
SHERIDAN	0.0	8.7	71.6	4.3
SIOUX	0.0	8.3	87.3	5.3
NORTH REPORTING DISTRICT				
ARTHUR	0.0	0.8	0.0	0.0
BLAINE	0.0	6.8	2.1	0.1
BOYD	0.1	27.8	4.6	0.3
BROWN	0.1	23.2	7.2	0.4
CHERRY	0.1	23.3	11.8	0.7
GARFIELD	0.0	4.2	0.9	0.1
GRANT	0.0	0.0	0.0	0.0
HOLT	0.3	57.8	9.3	0.6
HOOKER	0.0	3.2	0.2	0.0
KEYA	0.1	28.7	13.0	0.8
LOGAN	0.0	1.7	0.5	0.0
LOUP	0.0	3.8	1.1	0.1
MCPHERSO	0.0	0.9	0.1	0.0
ROCK	0.1	12.8	2.3	0.1
THOMAS	0.0	3.4	6.9	0.4
WHEELER	0.1	11.2	0.3	0.0
NORTHEAST REPORTING DISTRICT				
ANTELOPE	0.2	41.2	2.6	0.2
BOONE	0.1	13.8	0.0	0.0
BURT	0.1	19.8	0.0	0.0
CEDAR	0.1	24.1	0.0	0.0
CUMING	0.1	27.8	0.0	0.0
DAKOTA	0.1	30.4	0.0	0.0
DIXON	0.1	27.9	0.0	0.0

TABLE 14. CONTINUED

	SAW LOGS	FUEL WOOD	SAW LOGS	FUEL WOOD
KNOX	0.3	69.3	8.5	0.5
MADISON	0.0	10.5	0.0	0.0
PIERCE	0.0	6.5	0.0	0.0
STANTON	0.1	25.8	0.0	0.0
THURSTON	0.2	33.3	0.0	0.0
WAYNE	0.0	6.0	0.0	0.0
CENTRAL REPORTING DISTRICT				
BUFFALO	0.1	24.3	0.0	0.0
CUSTER	0.3	62.9	0.0	0.0
DAWSON	0.1	12.0	0.0	0.0
GREELEY	0.0	1.0	0.0	0.0
HALL	0.1	13.5	0.0	0.0
HOWARD	0.1	17.2	0.0	0.0
SHERMAN	0.0	8.2	0.0	0.0
VALLEY	0.0	4.0	0.0	0.0
EAST REPORTING DISTRICT				
BUTLER	0.1	16.7	0.0	0.0
CASS	0.4	73.9	0.0	0.0
COLFAX	0.1	16.0	0.0	0.0
DODGE	0.1	29.9	0.0	0.0
DOUGLAS	0.1	26.3	0.0	0.0
HAMILTON	0.0	7.9	0.0	0.0
LANCASTE	0.1	24.8	0.0	0.0
MERRICK	0.1	11.9	0.0	0.0
NANCE	0.2	34.9	0.0	0.0
PLATTE	0.1	18.5	0.0	0.0
POLK	0.1	16.4	0.0	0.0
SARPY	0.1	24.2	0.0	0.0
SAUNDERS	0.1	25.6	0.0	0.0
SEWARD	0.1	20.9	0.0	0.0
WASHINGT	0.2	38.1	0.0	0.0
YORK	0.0	4.1	0.0	0.0
SOUTHWEST REPORTING DISTRICT				
CHASE	0.0	0.4	0.0	0.0
DUNDY	0.0	5.7	0.1	0.0
FRONTIER	0.0	4.4	0.0	0.0
HAYES	0.0	2.6	0.6	0.0
HITCHCOC	0.1	16.7	0.0	0.0
KEITH	0.1	11.4	0.0	0.0
LINCOLN	0.1	18.6	0.9	0.1
PERKINS	0.0	0.0	0.0	0.0
RED	0.1	14.3	0.0	0.0

TABLE 14. CONTINUED

	SAW LOGS	FUEL WOOD	SAW LOGS	FUEL WOOD
SOUTH REPORTING DISTRICT				
ADAMS	0.1	13.2	0.0	0.0
FRANKLIN	0.1	18.8	0.0	0.0
FURNAS	0.1	13.5	0.0	0.0
GOSPER	0.0	1.9	0.0	0.0
HARLAN	0.1	13.4	0.0	0.0
KEARNEY	0.0	0.6	0.0	0.0
PHELPS	0.0	1.6	0.0	0.0
WEBSTER	0.2	40.0	0.0	0.0
SOUTHEAST REPORTING DISTRICT				
CLAY	0.0	8.8	0.0	0.0
FILLMORE	0.0	6.3	0.0	0.0
GAGE	0.2	49.6	0.0	0.0
JEFFERSO	0.4	82.2	0.0	0.0
JOHNSON	0.2	38.2	0.0	0.0
NEMAHA	0.2	37.5	0.0	0.0
NUCKOLLS	0.1	17.3	0.0	0.0
OTOE	0.2	38.6	0.0	0.0
PAWNEE	0.1	31.0	0.0	0.0
RICHARDS	0.2	45.0	0.0	0.0
SALINE	0.1	25.9	0.0	0.0
THAYER	0.1	15.1	0.0	0.0
SUMMARY TOTAL				
NEBRASKA	8.0	1694.1	347.7	21.0

TABLE 15.

NUMBER AND LOCATION OF NEBRASKA SAWMILLS
BY SIZE (MILLION BOARD FEET) AND BY COUNTY

	1 - 50	50 - 500	500 - 1000	1000 - 2000	2000 - 5000
NORTHWEST REPORTING DISTRICT					
BANNER	1	-	-	-	-
BOX	-	-	-	-	-
CHEYENNE	-	-	-	-	-
DAWES	1	1	2	-	-
DEUEL	1	-	-	-	-
GARDEN	-	-	-	-	-
KIMBALL	-	-	-	-	-
MORILL	-	-	-	-	-
SCOTTS	-	-	-	-	-
SHERIDAN	2	1	-	-	-
SIOUX	-	-	-	-	-
NORTH REPORTING DISTRICT					
ARTHUR	1	-	-	-	-
BLAINE	-	-	-	-	-
BOYD	3	-	-	-	-
BROWN	3	-	-	-	-
CHERRY	1	-	-	-	-
GARFIELD	-	-	-	-	-
GRANT	-	-	-	-	-
HOLT	2	-	-	-	-
HOOKER	-	-	-	-	-
KEYA	3	-	-	-	-
LOGAN	-	-	-	-	-
LOUP	1	-	-	-	-
MCPHERSO	-	-	-	-	-
ROCK	1	-	-	-	-
THOMAS	1	-	-	-	-
WHEELER	-	-	-	-	-
NORTHEAST REPORTING DISTRICT					
ANTELOPE	2	-	-	-	-
BOONE	2	-	-	-	-
BURT	1	-	-	-	-
CEDAR	1	-	-	-	-
CUMING	-	1	-	-	-
DAKOTA	-	-	-	1	-
DIXON	3	-	-	1	-

TABLE 15. CONTINUED

	1 - 50	50 - 500	500 - 1000	1000 - 2000	2000 - 5000
KNOX	7	3	-	-	-
MADISON	2	1	-	1	-
PIERCE	-	-	-	-	-
STANTON	-	-	-	-	-
THURSTON	1	-	-	-	-
WAYNE	-	-	-	-	-
CENTRAL REPORTING DISTRICT					
BUFFALO	-	2	-	-	-
CUSTER	2	-	-	-	-
DAWSON	1	1	-	-	-
GREELEY	1	1	-	-	-
HALL	1	-	-	-	-
HOWARD	-	-	-	-	-
SHERMAN	1	-	-	-	-
VALLEY	1	-	-	-	-
EAST REPORTING DISTRICT					
BUTLER	1	1	-	-	1
CASS	-	-	-	1	-
COLFAX	-	-	-	-	-
DODGE	-	1	-	-	-
DOUGLAS	-	-	-	-	-
HAMILTON	1	-	-	-	-
LANCASTE	3	2	-	-	-
MERRICK	4	-	-	-	1
NANCE	-	-	-	-	-
PLATTE	1	1	-	-	-
POLK	-	-	-	-	-
SARPY	-	-	-	-	-
SAUNDERS	1	-	-	-	-
SEWARD	-	-	-	-	-
WASHINGT	-	-	-	-	-
YORK	3	-	-	-	-
SOUTHWEST REPORTING DISTRICT					
CHASE	-	-	-	-	-
DUNDY	-	-	-	-	-
FRONTIER	-	-	-	-	-
HAYES	-	-	-	-	-
HITCHCOC	-	-	-	-	-
KEITH	1	-	-	-	-
LINCOLN	-	-	-	-	-
PERKINS	-	-	-	-	-
RED	-	-	-	-	-

TABLE 15. CONTINUED

	1 - 50	50 - 500	500 - 1000	1000 - 2000	2000 - 5000
SOUTH REPORTING DISTRICT					
ADAMS	-	1	-	-	-
FRANKLIN	-	-	-	-	-
FURNAS	1	-	-	-	-
GOSPER	-	-	-	-	-
HARLAN	-	1	-	-	-
KEARNEY	1	-	-	-	-
PHELPS	-	-	-	-	-
WEBSTER	-	1	-	-	-
SOUTHEAST REPORTING DISTRICT					
CLAY	-	1	-	-	-
FILLMORE	-	-	-	-	-
GAGE	-	-	-	-	-
JEFFERSON	4	1	-	-	-
JOHNSON	1	-	-	-	-
NEMAHA	-	1	-	1	-
NUCKOLLS	-	-	-	-	-
OTOE	2	-	-	-	-
PAWNEE	1	3	-	-	-
RICHARDS	3	-	1	-	-
SALINE	-	-	1	-	-
THAYER	1	-	-	-	-

TABLE 16.

ESTIMATED POTENTIAL ETHANOL CAPACITY IN NEBRASKA BY COUNTY
 BASED ON CORN AVAILABLE AFTER LIVESTOCK NEEDS

	TOTAL BUSHELS PRODUCED	POTENTIAL ETOH FROM ALL CORN	CORN FOR FEEDING LIVESTOCK	NET CORN AVAILABLE	NET ETOH FROM CORN AVAILABLE
NORTHWEST REPORTING DISTRICT					
BANNER	517000	1595462	581529	-64529	0
BOX	4854800	14981913	2956230	1898570	5858988
CHEYENNE	1269600	3917986	4025076	-2755476	0
DAWES	289800	894323	1050127	-760327	0
DEUEL	1418800	4378417	492305	926495	2859164
GARDEN	540800	1668909	2169161	-1628361	0
KIMBALL	440800	1360309	489089	-48289	0
MORRILL	5331200	16452083	4010918	1320282	4074392
SCOTTS	5217600	16101514	6205147	-987547	0
SHERIDAN	2595300	8009096	3151725	-556425	0
SIoux	987600	3047734	2487248	-1499648	0
NORTH REPORTING DISTRICT					
ARTHUR	0	0	580251	-580251	0
BLAINE	433900	1339015	1027016	-593116	0
BOYD	1625000	5014750	950908	674092	2080248
BROWN	4462000	13769732	2887622	1574378	4858531
CERRY	60200	185777	6036028	-5975828	0
GARFIELD	1388200	4283985	1137073	251127	774977
GRANT	0	0	646115	-646115	0
HOLT	11646600	35941408	5146668	6499932	20058790
HOOKEr	0	0	425613	-425613	0
KEYA	504500	1556887	1079516	-575016	0
LOGAN	2187100	6749391	955210	1231890	3801614
LOUP	501000	1546086	682959	-181959	0
MCPHERSO	0	0	604210	-604210	0
ROCK	1632300	5037278	2048709	-416409	0
THOMAS	5800	17899	561171	-555371	0
WHEELER	175000	540050	103165	71835	221681
NORTHEAST REPORTING DISTRICT					
ANTELOPE	18896200	58313673	3212265	15683935	48400625
BOONE	14168000	43722448	3054418	11113582	34296515
BURT	12088100	37303877	1965697	10122403	31237737
CEDAR	10980700	33886440	3485903	7494797	23128944

TABLE 16. CONTINUED

	TOTAL BUSHELLS PRODUCED	POTENTIAL ETOH FROM ALL CORN	CORN FOR FEEDING LIVESTOCK	NET CORN AVAILABLE	NET ETOH FROM CORN AVAILABLE
CUMING	13528800	41749877	16351333	-2822533	0
DAKOTA	5184000	15997824	339155	4844845	14951192
DIXON	7603800	23465327	2836360	4767440	14712321
KNOX	6203700	19144618	4092470	2111230	6515255
MADISON	10890800	33609009	3151760	7739040	23882677
PIERCE	10314600	31830856	2664057	7650543	23609575
STANTON	6594900	20351861	4421740	2173160	6706371
THURSTON	7149400	22063048	992673	6156727	18999660
WAYNE	8132600	25097204	3222630	4909970	15152166

CENTRAL REPORTING DISTRICT

BUFFALO	23245400	71735304	4411443	18833957	58121592
CUSTER	21966400	67788310	6700441	15265959	47110749
DAWSON	24303500	75000601	15517270	8786230	27114306
GREELEY	3935000	12143410	1121441	2813559	8682643
HALL	23574000	72749364	5120336	18453664	56948007
HOWARD	11275600	34796502	1525611	9749989	30088466
SHERMAN	4688700	14469328	1081562	3607139	11131629
VALLEY	6961000	21481646	2076448	4884552	15073727

EAST REPORTING DISTRICT

BUTLER	13640400	42094274	1595748	12044652	37169796
CASS	8092800	24974381	942183	7150617	22066805
COLFAX	9463900	29205595	5206617	4257283	13137974
DODGE	14798000	45666628	2935982	11862018	36606187
DOUGLAS	4702600	14512224	66845	4635755	14305939
HAMILTON	29227300	90195448	2111818	27115482	83678377
LANCASTE	1692400	5222746	816586	875814	2702763
MERRICK	17734800	54729593	2413836	15320964	47280494
NANCE	7374500	22757707	1312226	6062274	18708177
PLATTE	18849000	58168014	3705434	15143566	46733045
POLK	13676000	42204136	3461118	10214882	31523126
SARPY	4564200	14085121	2677928	1886272	5821036
SAUNDERS	12926400	39890870	5612805	7313595	22569755
SEWARD	10744100	33156293	2582847	8161253	25185627
WASHINGT	8516100	26280685	2292910	6223190	19204765
YORK	26152100	80705381	2727914	23424186	72287038

SOUTHWEST REPORTING DISTRICT

CHASE	15641000	48268126	1746452	13894548	42878577
DUNDY	11174500	34484507	2041343	9133157	28184921
FRONTIER	7186200	22176613	1027584	6158616	19005490
HAYES	3822000	11794692	2798997	1023003	3156989

TABLE 16. CONTINUED

	TOTAL BUSHELS PRODUCED	POTENTIAL ETOH FROM ALL CORN	CORN FOR FEEDING LIVESTOCK	NET CORN AVAILABLE	NET ETOH FROM CORN AVAILABLE
HITCHCOC	3472000	10714592	957769	2514231	7758918
KEITH	6297400	19433776	2861715	3435685	10602525
LINCOLN	18147500	56003185	3588699	14558801	44928459
PERKINS	13548000	41809128	573360	12974640	40039739
RED	5603200	17291475	2965185	2638015	8140916
SOUTH REPORTING DISTRICT					
ADAMS	18983800	58584007	3348523	15635277	48250466
FRANKLIN	8012900	24727809	1180122	6832778	21085953
FURNAS	5753800	17756227	1723995	4029805	12435980
GOSPER	7806400	24090550	777271	7029129	21691891
HARLAN	7373200	22753695	2214176	5159024	15920747
KEARNEY	21472600	66264444	4837493	16635107	51335939
PHELPS	26360000	81346960	9092311	17267689	53288089
WEBSTER	3796600	11716308	1122107	2674493	8253484
SOUTHEAST REPORTING DISTRICT					
CLAY	17723000	54693178	3209514	14513486	44788617
FILLMORE	18586600	57358248	1821727	16764873	51736398
GAGE	3827600	11811974	1832227	1995373	6157723
JEFFERSO	4458500	13758931	1571932	2886568	8907950
JOHNSON	1155000	3564330	593415	561585	1733053
NEMAHA	4913300	15162444	710805	4202495	12968900
NUCKOLLS	4959300	15304400	1252185	3707115	11440156
OTOE	6200000	19133200	916280	5283720	16305560
PAWNEE	552500	1705015	631419	-78919	0
RICHARDS	4889100	15087763	1100617	3788483	11691258
SALINE	6765500	20878333	976027	5789473	17866314
THAYER	10547400	32549276	2635169	7912231	24417146
NEBRASKA	770953600	2379162810	248482598	522471002	1612345513

Table 17 Feed Requirements for Livestock

Livestock	Annual Bushels of Feed Grain Consumed per Head
Pig Crop	18.2
Dairy Stock	27.6
Beef Stock	1.75
Steers	46.4
Heifers	37.5
Stock Calves & Grass Slaughter Stock	2.01
Lambs	1.34

TABLE 18.

ESTIMATED POTENTIAL ETHANOL CAPACITY IN NEBRASKA

BASED ON HARVESTABLE CORN RESIDUES

	TOTAL POUNDS OF RESIDUE HARVESTABLE	POTENTIAL ETOH FROM RESIDUE	NET ETOH FROM CORN AVAILABLE	TOTAL CORN-BASED POTENTIAL
NORTHWEST REPORTING DISTRICT				
BANNER	16213120	356689	0	356689
BOX	152246528	3349424	5858988	9208411
CHEYENNE	42194880	928287	0	928287
DAWES	1514688	33323	0	33323
DEUEL	44493568	978858	2859164	3838022
GARDEN	3760848	82739	0	82739
KIMBALL	17135104	376972	0	376972
MORRILL	183267056	4031875	4074392	8106267
SCOTTS	119773248	2635011	0	2635011
SHERIDAN	81388608	1790549	0	1790549
SIOUX	4628736	101832	0	101832
NORTH REPORTING DISTRICT				
ARTHUR	0	0	0	0
BLAINE	13607104	299356	0	299356
BOYD	46890256	1031586	2080248	3111833
BROWN	111094368	2444076	4858531	7302607
CHERRY	1887872	41533	0	41533
GARFIELD	46489632	1022772	774977	1797748
GRANT	0	0	0	0
HOLT	205214352	4514716	20058790	24573506
HOOKER	0	0	0	0
KEYA	15821120	348065	0	348065
LOGAN	66035536	1452782	3801614	5254396
LOUP	17099040	376179	0	376179
MCPHERSON	0	0	0	0
ROCK	10349976	227699	0	227699
THOMAS	181888	4002	0	4002
WHEELER	5488000	120736	221681	342417
NORTHEAST REPORTING DISTRICT				
ANTELOPE	410665864	9034649	48400625	57435274
BOONE	434109424	9550407	34296515	43846923
BURT	424882528	9347416	31237737	40585152
CEDAR	338291296	7442409	23128944	30571353

TABLE 18. CONTINUED

	TOTAL POUNDS OF RESIDUE HARVESTABLE	POTENTIAL ETOH FROM RESIDUE	NET ETOH FROM CORN AVAILABLE	TOTAL CORN-BASED POTENTIAL
CUMING	442439424	9733667	0	9733667
DAKOTA	159536944	3509813	14951192	18461005
DIXON	244309296	5374805	14712321	20087126
KNOX	209899536	4617790	6515255	11133045
MADISON	296050552	6513112	23882677	30395789
PIERCE	271277720	5968110	23609575	29577685
STANTON	209265672	4603845	6706371	11310215
THURSTON	207247264	4559440	18999660	23559100
WAYNE	271582304	5974811	15152166	21126977
CENTRAL REPORTING DISTRICT				
BUFFALO	834260672	18353735	58121592	76475327
CUSTER	688866304	15155059	47110749	62265808
DAWSON	952697200	20959338	27114306	48073644
GREELEY	90364624	1988022	8682643	10670665
HALL	733706400	16141541	56948007	73089547
HOWARD	336985152	7413673	30088466	37502139
SHERMAN	146524112	3223530	11131629	14355160
VALLEY	216750912	4768520	15073727	19842247
EAST REPORTING DISTRICT				
BUTLER	525784896	11567268	37169796	48737063
CASS	269683456	5933036	22066805	27999841
COLFAX	310656080	6834434	13137974	19972408
DODGE	504116704	11090567	36606187	47696754
DOUGLAS	141096480	3104123	14305939	17410061
HAMILTON	1119283088	24624228	83678377	108302605
LANCASTE	63833280	1404332	2702763	4107095
MERRICK	489328896	10765236	47280494	58045730
NANCE	238900480	5255811	18708177	23963987
PLATTE	492012528	10824276	46733045	57557320
POLK	536099200	11794182	31523126	43317308
SARPY	140971432	3101372	5821036	8922408
SAUNDERS	451427200	9931398	22569755	32501154
SEWARD	382298000	8410556	25185627	33596183
WASHINGT	266028448	5852626	19204765	25057391
YORK	990415440	21789140	72287038	94076178
SOUTHWEST REPORTING DISTRICT				
CHASE	527420320	11603247	42878577	54481824
DUNDY	174203232	3832471	28184921	32017392
FRONTIER	242070976	5325561	19005490	24331052
HAYES	125890800	2769598	3156989	5926586

TABLE 13. CONTINUED

	TOTAL POUNDS OF RESIDUE HARVESTABLE	POTENTIAL ETOH FROM RESIDUE	NET ETOH FROM CORN AVAILABLE	TOTAL CORN-BASED POTENTIAL
HITCHCOC	131696320	2897319	7758918	10656237
KEITH	204213184	4492690	10602525	15095215
LINCOLN	498867040	10975075	44928459	55903533
PERKINS	406893648	8951660	40039739	48991399
RED	175716352	3865760	8140916	12006675
SOUTH REPORTING DISTRICT				
ADAMS	718361952	15803963	48250466	64054429
FRANKLIN	283882480	6245415	21085953	27331368
FURNAS	204253952	4493587	12435980	16929567
GOSPER	271812800	5979882	21691891	27671772
HARLAN	260758400	5736685	15920747	21657431
KEARNEY	785497832	17280952	51335939	68616891
PHELPS	969030272	21318666	53288089	74606755
WEBSTER	126841792	2790519	8253484	11044004
SOUTHEAST REPORTING DISTRICT				
CLAY	611675232	13456855	44788617	58245472
FILLMORE	588333984	12943348	51736398	64679745
GAGE	130880960	2879381	6157723	9037104
JEFFERSO	146698160	3227360	8907950	12135310
JOHNSON	23600360	519208	1733053	2252261
NEMAHA	155068928	3411516	12968900	16380416
NUCKOLLS	180104400	3962297	11440156	15402453
OTOE	196551936	4324143	16305560	20629702
PAWNEE	18992400	417833	0	417833
RICHARDS	168977088	3717496	11691258	15408754
SALINE	232169840	5107736	17866314	22974050
THAYER	346275552	7618062	24417146	32035209
NEBRASKA	24955164528	549013620	1612345513	2161359133

TABLE 19.

ESTIMATED POTENTIAL ETHANOL CAPACITY IN NEBRASKA
 BASED ON SUGAR BEETS

	TOTAL ACRES OF BEETS	BEEET PRODUCTION (TONS)	POTENTIAL ETOH FROM BEETS
NORTHWEST REPORTING DISTRICT			
BANNER	600	10980	222894
BOX	18050	357390	7255017
CHEYENNE	1470	26754	543106
DAWES	0	0	0
DEUEL	0	0	0
GARDEN	0	0	0
KIMBALL	0	0	0
MORRILL	7630	139629	2834469
SCOTTS	29100	506340	10278702
SHERIDAN	0	0	0
SIOUX	3350	61305	1244491
NORTH REPORTING DISTRICT			
ARTHUR	0	0	0
BLAINE	0	0	0
BOYD	0	0	0
BROWN	0	0	0
CHERRY	0	0	0
GARFIELD	0	0	0
GRANT	0	0	0
HOLT	0	0	0
HOOKER	0	0	0
KEYA	0	0	0
LOGAN	0	0	0
LOUP	0	0	0
MCPHERSO	0	0	0
ROCK	0	0	0
THOMAS	0	0	0
WHEELER	0	0	0
NORTHEAST REPORTING DISTRICT			
ANTELOPE	0	0	0
BOONE	0	0	0
BURT	0	0	0
CEDAR	0	0	0
CUMING	0	0	0
DAKOTA	0	0	0

TABLE 19. CONTINUED

	TOTAL ACRES OF BEETS	BEEET PRODUCTION (TONS)	POTENTIAL ETOH FROM BEETS
DIXON	0	0	0
KNOX	0	0	0
MADISON	0	0	0
PIERCE	0	0	0
STANTON	0	0	0
THURSTON	0	0	0
WAYNE	0	0	0
CENTRAL REPORTING DISTRICT			
BUFFALO	0	0	0
CUSTER	0	0	0
DAWSON	0	0	0
GREELEY	0	0	0
HALL	0	0	0
HOWARD	0	0	0
SHERMAN	0	0	0
VALLEY	0	0	0
EAST REPORTING DISTRICT			
BUTLER	0	0	0
CASS	0	0	0
COLFAX	0	0	0
DODGE	0	0	0
DOUGLAS	0	0	0
HAMILTON	0	0	0
LANCASTE	0	0	0
MERRICK	0	0	0
NANCE	0	0	0
PLATTE	0	0	0
POLK	0	0	0
SARPY	0	0	0
SAUNDERS	0	0	0
SEWARD	0	0	0
WASHINGT	0	0	0
YORK	0	0	0
SOUTHWEST REPORTING DISTRICT			
CHASE	0	0	0
DUNDY	0	0	0
FRONTIER	0	0	0
HAYES	0	0	0
HITCHCOC	0	0	0
KEITH	0	0	0

TABLE 19. CONTINUED

	TOTAL ACRES OF BEETS	BEEET PRODUCTION (TONS)	POTENTIAL ETOH FROM BEETS
LINCOLN	0	0	0
PERKINS	0	0	0
RED	0	0	0
SOUTH REPORTING DISTRICT			
ADAMS	0	0	0
FRANKLIN	0	0	0
FURNAS	0	0	0
GOSPER	0	0	0
HARLAN	0	0	0
KEARNEY	0	0	0
PHELPS	0	0	0
WEBSTER	0	0	0
SOUTHEAST REPORTING DISTRICT			
CLAY	0	0	0
FILLMORE	0	0	0
GAGE	0	0	0
JEFFERSO	0	0	0
JOHNSON	0	0	0
NEMAHA	0	0	0
NUCKOLLS	0	0	0
OTOE	0	0	0
PAWNEE	0	0	0
RICHARDS	0	0	0
SALINE	0	0	0
THAYER	0	0	0
NEBRASKA	60200	1102398	22378679

TABLE 20.

ESTIMATED POTENTIAL ETHANOL CAPACITY IN NEBRASKA
 BASED ON GRAIN SORGHUM AND HARVESTABLE RESIDUES

	TOTAL SORGHUM CROP	POTENTIAL ETOH FROM GRAIN	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUE	TOTAL ETOH FROM SORGHUM
NORTHWEST REPORTING DISTRICT					
BANNER	26600	69160	849072	51793	120953
BOX	3800	9880	121296	7399	17279
CHEYENNE	32400	84240	1034208	63087	147327
DAWES	15200	39520	485184	29596	69116
DEUEL	48800	126880	1557696	95019	221899
GARDEN	22800	59280	727776	44394	103674
KIMBALL	10800	28080	344736	21029	49109
MORRILL	19000	49400	606480	36995	86395
SCOTTS	10800	28080	43092	2629	30709
SHERIDAN	19000	49400	606480	36995	86395
SIOUX	11400	29640	363888	22197	51837
NORTH REPORTING DISTRICT					
ARTHUR	0	0	0	0	0
BLAINE	0	0	0	0	0
BOYD	442200	1149720	14115024	861016	2010736
BROWN	13400	34840	427728	26091	60931
CERRY	20100	52260	641592	39137	91397
GARFIELD	7900	20540	252168	15382	35922
GRANT	0	0	0	0	0
HOLT	33500	87100	133665	8154	95254
HOOVER	0	0	0	0	0
KEYA	13400	34840	427728	26091	60931
LOGAN	0	0	0	0	0
LOUP	0	0	0	0	0
MCPHERSON	0	0	0	0	0
ROCK	0	0	0	0	0
THOMAS	0	0	0	0	0
WHEELER	0	0	0	0	0
NORTHEAST REPORTING DISTRICT					
ANTELOPE	13800	35880	55062	3359	39239
BOONE	151800	394680	605682	36947	431627
BURT	0	0	0	0	0
CEDAR	13800	35880	55062	3359	39239
CUMING	43900	114140	175161	10685	124825

TABLE 20. CONTINUED

	TOTAL SORGHUM CROP	POTENTIAL ETOH FROM GRAIN	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUE	TOTAL ETOH FROM SORGHUM
DAKOTA	0	0	0	0	0
DIXON	6900	17940	27531	1679	19619
KNOX	200100	520260	6387192	389619	909879
MADISON	6900	17940	27531	1679	19619
PIERCE	13800	35880	55062	3359	39239
STANTON	13800	35880	55062	3359	39239
THURSTON	0	0	0	0	0
WAYNE	6900	17940	27531	1679	19619

CENTRAL REPORTING DISTRICT

BUFFALO	496800	1291680	14897064	908721	2200401
CUSTER	87800	228280	2081982	127001	355281
DAWSON	113700	295620	3726660	227326	522946
GREELEY	0	0	0	0	0
HALL	259400	674440	7319256	446475	1120915
HOWARD	115500	300300	3686760	224892	525192
SHERMAN	189100	491660	6036072	368200	859860
VALLEY	111000	288600	3302922	201478	490078

EAST REPORTING DISTRICT

BUTLER	3633800	9447880	67993191	4147585	13595465
CASS	1615400	4200040	6445446	393172	4593212
COLFAX	202500	526500	807975	49286	575786
DODGE	450600	1171560	1797894	109672	1281232
DOUGLAS	8700	22620	34713	2117	24737
HAMILTON	1408700	3662620	52269000	3188409	6851029
LANCASTE	9663300	25124580	163437183	9969668	35094248
MERRICK	65800	171080	1586424	96772	267852
NANCE	639900	1663740	20425608	1245962	2909702
PLATTE	171000	444600	682290	41620	486220
POLK	2825000	7345000	96210870	5868863	13213863
SARPY	43500	113100	173565	10587	123687
SAUNDERS	1637600	4257760	6534024	398575	4656335
SEWARD	6205100	16133260	142748634	8707667	24840927
WASHINGTON	44500	115700	177555	10831	126531
YORK	2941900	7648940	101239866	6175632	13824572

SOUTHWEST REPORTING DISTRICT

CHASE	130100	338260	3862320	235602	573862
DUNDY	421200	1095120	13444704	820127	1915247
FRONTIER	1344200	3494920	42906864	2617319	6112239
HAYES	254000	660400	7817208	476850	1137250
HITCHCOC	1094600	2845960	34939632	2131318	4977278

TABLE 20. CONTINUED

	TOTAL SORGHUM CROP	POTENTIAL ETOH FROM GRAIN	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUE	TOTAL ETOH FROM SORGHUM
KEITH	81800	212680	2611056	159274	371954
LINCOLN	88400	229840	2531256	154407	384247
PERKINS	84200	218920	2397192	146229	365149
RED	1676800	4359680	53232984	3247212	7606892
SOUTH REPORTING DISTRICT					
ADAMS	2515700	6540820	80301144	4898370	11439190
FRANKLIN	2378100	6183060	73562832	4487333	10670393
FURNAS	2608200	6781320	83253744	5078478	11859798
GOSPER	1143800	2973880	36510096	2227116	5200996
HARLAN	2109100	5483660	67322472	4106671	9590331
KEARNEY	1089400	2832440	33321288	2032599	4865039
PHELPS	502100	1305460	15474018	943915	2249375
WEBSTER	2882400	7494240	83174742	5073659	12567899
SOUTHEAST REPORTING DISTRICT					
CLAY	3429500	8916700	101612931	6198389	15115089
FILLMORE	4263600	11085360	119553966	7292792	18378152
GAGE	10559300	27454180	199556259	12172932	39627112
JEFFERSO	4860800	12638080	141795024	8649496	21287576
JOHNSON	3021300	7855380	34225821	2087775	9943155
NEMAHA	1179200	3065920	4705008	287005	3352925
NUCKOLLS	4832000	12563200	163433592	9969449	22532649
OTOE	3627400	9431240	16467528	1004519	10435759
PAWNEE	3568000	9276800	23620800	1440869	10717669
RICHARDS	1887300	4906980	7530327	459350	5366330
SALINE	6437900	16738540	205497768	12535364	29273904
THAYER	4915200	12779520	119966931	7317983	20097503
NEBRASKA	107139000	278561400	2508453150	153015642	431577042

TABLE 21.

ESTIMATED POTENTIAL ETHANOL CAPACITY IN NEBRASKA

BASED ON BARLEY AND HARVESTABLE RESIDUES

	TOTAL BARLEY CROP	POTENTIAL ETOH FROM BARLEY	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUES	TOTAL ETOH FROM BARLEY
NORTHWEST REPORTING DISTRICT					
BANNER	156800	392000	773808	12071	404071
BOX	245000	612500	1209075	18862	631362
CHEYENNE	180200	450500	7114296	110983	561483
DAWES	108500	271250	535448	8353	279603
DEUEL	264000	660000	10422720	162594	822594
GARDEN	113400	283500	4477032	69842	353342
KIMBALL	368550	921375	1818794	28373	949748
MORRILL	15200	38000	75012	1170	39170
SCOTTS	34200	85500	168777	2633	88133
SHERIDAN	143500	358750	5665380	88380	447130
SIOUX	15000	37500	74025	1155	38655
NORTH REPORTING DISTRICT					
ARTHUR	0	0	0	0	0
BLAINE	0	0	0	0	0
BOYD	45900	114750	226517	3534	118284
BROWN	0	0	0	0	0
CHERRY	2700	6750	106596	1663	8413
GARFIELD	0	0	0	0	0
GRANT	0	0	0	0	0
HOLT	0	0	0	0	0
HOOKER	0	0	0	0	0
KEYA	2700	6750	13325	208	6958
LOGAN	0	0	0	0	0
LOUP	0	0	0	0	0
MCPHERSO	0	0	0	0	0
ROCK	0	0	0	0	0
THOMAS	0	0	0	0	0
WHEELER	0	0	0	0	0
NORTHEAST REPORTING DISTRICT					
ANTELOPE	8200	20500	40467	631	21131
BOONE	4100	10250	20234	316	10566
BURT	0	0	0	0	0
CEDAR	0	0	0	0	0
CUMING	4100	10250	20234	316	10566
DAKOTA	0	0	0	0	0

TABLE 21. CONTINUED

	TOTAL BARLEY CROP	POTENTIAL ETOH FROM BARLEY	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUES	TOTAL ETOH FROM BARLEY
DIXON	0	0	0	0	0
KNOX	0	0	0	0	0
MADISON	0	0	0	0	0
PIERCE	4100	10250	20234	316	10566
STANTON	24600	61500	121401	1894	63394
THURSTON	0	0	0	0	0
WAYNE	28700	71750	141635	2209	73959

CENTRAL REPORTING DISTRICT

BUFFALO	0	0	0	0	0
CUSTER	6800	17000	33558	524	17524
DAWSON	0	0	0	0	0
GREELEY	0	0	0	0	0
HALL	0	0	0	0	0
HOWARD	0	0	0	0	0
SHERMAN	0	0	0	0	0
VALLEY	0	0	0	0	0

EAST REPORTING DISTRICT

BUTLER	0	0	0	0	0
CASS	0	0	0	0	0
COLFAX	0	0	0	0	0
DODGE	0	0	0	0	0
DOUGLAS	0	0	0	0	0
HAMILTON	0	0	0	0	0
LANCASTE	0	0	0	0	0
MERRICK	0	0	0	0	0
NANCE	0	0	0	0	0
PLATTE	0	0	0	0	0
POLK	0	0	0	0	0
SARPY	0	0	0	0	0
SAUNDERS	0	0	0	0	0
SEWARD	0	0	0	0	0
WASHINGT	0	0	0	0	0
YORK	0	0	0	0	0

SOUTHWEST REPORTING DISTRICT

CHASE	32000	80000	1263360	19708	99708
DUNDY	11100	27750	438228	6836	34586
FRONTIER	12300	30750	485604	7575	38325
HAYES	15200	38000	600096	9361	47361
HITCHCOC	20000	50000	789600	12318	62318
KEITH	77400	193500	3055752	47670	241170

TABLE 21. CONTINUED

	TOTAL BARLEY CROP	POTENTIAL ETOH FROM BARLEY	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUES	TOTAL ETOH FROM BARLEY
LINCOLN	10800	27000	53298	831	27831
PERKINS	368000	920000	14528640	226647	1146647
RED	12000	30000	473760	7391	37391
SOUTH REPORTING DISTRICT					
ADAMS	0	0	0	0	0
FRANKLIN	0	0	0	0	0
FURNAS	13200	33000	521136	8130	41130
GOSPER	0	0	0	0	0
HARLAN	9900	24750	390852	6097	30847
KEARNEY	0	0	0	0	0
PHELPS	3300	8250	130284	2032	10282
WEBSTER	0	0	0	0	0
SOUTHEAST REPORTING DISTRICT					
CLAY	0	0	0	0	0
FILLMORE	0	0	0	0	0
GAGE	0	0	0	0	0
JEFFERSO	4000	10000	19740	308	10308
JOHNSON	0	0	0	0	0
NEMAHA	4000	10000	19740	308	10308
NUCKOLLS	4000	10000	19740	308	10308
OTOE	0	0	0	0	0
PAWNEE	4000	10000	19740	308	10308
RICHARDS	0	0	0	0	0
SALINE	0	0	0	0	0
THAYER	0	0	0	0	0
NEBRASKA	2377450	5943625	55888135	871855	6815480

TABLE 22.

ESTIMATED POTENTIAL ETHANOL CAPACITY IN NEBRASKA

BASED ON WHEAT AND HARVESTABLE RESIDUES

	TOTAL WHEAT CROP	POTENTIAL ETOH FROM WHEAT	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUES	TOTAL ETOH FROM WHEAT
NORTHWEST REPORTING DISTRICT					
BANNER	1796270	4670302	24902737	622568	5292870
BOX	3315150	8619390	163387355	4084684	12704074
CHEYENNE	8375950	21777470	454311528	11357788	33135258
DAWES	1688700	4390620	91595088	2289877	6680497
DEUEL	3500880	9102288	189887731	4747193	13849481
GARDEN	1816700	4723420	98537808	2463445	7186865
KIMBALL	4334900	11270740	95530878	2388272	13659012
MORRILL	1111500	2889900	60287760	1507194	4397094
SCOTTS	329670	857142	2235163	55879	913021
SHERIDAN	1945800	5059080	105540192	2638505	7697585
SIoux	300840	782184	11765198	294130	1076314
NORTH REPORTING DISTRICT					
ARTHUR	0	0	0	0	0
BLAINE	7100	18460	385104	9628	28088
BOYD	86160	224016	4673318	116833	340849
BROWN	7100	18460	385104	9628	28088
CHERRY	38600	100360	2093664	52342	152702
GARFIELD	12210	31746	662270	16557	48303
GRANT	0	0	0	0	0
HOLT	141570	368082	959845	23996	392078
HOOKER	0	0	0	0	0
KEYA	62400	162240	3384576	84614	246854
LOGAN	175500	456300	4706676	117667	573967
LOUP	0	0	0	0	0
MCPHERSO	0	0	0	0	0
ROCK	0	0	0	0	0
THOMAS	3400	8840	184416	4610	13450
WHEELER	0	0	0	0	0
NORTHEAST REPORTING DISTRICT					
ANTELOPE	20700	53820	140346	3509	57329
BOONE	121220	315172	821872	20547	335719
BURT	0	0	0	0	0
CEDAR	12090	31434	81970	2049	33483
CUMING	12090	31434	81970	2049	33483
DAKOTA	0	0	0	0	0

TABLE 22. CONTINUED

	TOTAL WHEAT CROP	POTENTIAL ETOH FROM WHEAT	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUES	TOTAL ETOH FROM WHEAT
DIXON	7800	20280	52884	1322	21602
KNOX	76570	199082	4153157	103829	302911
MADISON	16800	43680	113904	2848	46528
PIERCE	16800	43680	113904	2848	46528
STANTON	39400	102440	267132	6678	109118
THURSTON	0	0	0	0	0
WAYNE	19500	50700	132210	3305	54005
CENTRAL REPORTING DISTRICT					
BUFFALO	565920	1471392	30695501	767388	2238780
CUSTER	1177060	3060356	58626931	1465673	4526029
DAWSON	266570	693082	14458757	361469	1054551
GREELEY	0	0	0	0	0
HALL	147560	383656	8003654	200091	583747
HOWARD	184240	479024	9993178	249829	728853
SHERMAN	249600	648960	8207597	205190	854150
VALLEY	273890	712114	12511744	312794	1024908
EAST REPORTING DISTRICT					
BUTLER	332100	863460	2251638	56291	919751
CASS	791010	2056626	5363048	134076	2190702
COLFAX	142560	370656	966557	24164	394820
DODGE	79800	207480	541044	13526	221006
DOUGLAS	24180	62868	163940	4099	66967
HAMILTON	136590	355134	9260802	231520	586654
LANCASTE	2130040	5538104	14441671	361042	5899146
MERRICK	97060	252356	1859754	46494	298850
NANCE	292950	761670	15889608	397240	1158910
PLATTE	172770	449202	1171381	29285	478487
POLK	117260	304876	795023	19876	324752
SARPY	45400	118040	307812	7695	125735
SAUNDERS	364010	946426	2467988	61700	1008126
SEWARD	570240	1482624	3866227	96656	1579280
WASHINGT	94990	246974	644032	16101	263075
YORK	133560	347256	2490226	62256	409512
SOUTHWEST REPORTING DISTRICT					
CHASE	2107590	5479734	114315682	2857892	8337626
DUNDY	1580700	4109820	85737168	2143429	6253249
FRONTIER	1942850	5051410	105380184	2634505	7685915
HAYES	1994440	5185544	108178426	2704461	7890005
HITCHCOC	3103100	8068060	168312144	4207804	12275864
KEITH	2865390	7450014	155418754	3885469	11335483

TABLE 22. CONTINUED

	TOTAL WHEAT CROP	POTENTIAL ETOH FROM WHEAT	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUES	TOTAL ETOH FROM WHEAT
LINCOLN	1352610	3516786	73365566	1834139	5350925
PERKINS	5714730	14858298	309966955	7749174	22607472
RED	2888280	7509528	156660307	3916508	11426036
SOUTH REPORTING DISTRICT					
ADAMS	1462050	3801330	79301592	1982540	5783870
FRANKLIN	1052940	2737644	57111466	1427787	4165431
FURNAS	2907840	7560384	157721242	3943031	11503415
GOSPER	691160	1797016	37488518	937213	2734229
HARLAN	1592110	4139486	86356046	2158901	6298387
KEARNEY	974000	2532400	52829760	1320744	3853144
PHELPS	371300	965380	20139312	503483	1468863
WEBSTER	1803600	4689360	91645124	2291128	6980488
SOUTHEAST REPORTING DISTRICT					
CLAY	613080	1594008	29255429	731386	2325394
FILLMORE	928650	2414490	50369976	1259249	3673739
GAGE	1504950	3912870	10203561	255089	4167959
JEFFERSO	1440580	3745508	59509958	1487749	5233257
JOHNSON	488000	1268800	3308640	82716	1351516
NEMAHA	628000	1632800	4257840	106446	1739246
NUCKOLLS	1849520	4808752	68819712	1720493	6529245
OTOE	966240	2512224	6551107	163778	2676002
PAWNEE	346430	900718	2348795	58720	959438
RICHARDS	475200	1235520	3221856	80546	1316066
SALINE	1520480	3953248	37369597	934240	4887488
THAYER	1931180	5021068	83368372	2084209	7105277
NEBRASKA	84879730	220687298	3744866963	93621674	314308972

TABLE 23.

COMPARISON OF POTENTIAL ETHANOL PRODUCTION
WITH ESTIMATED GASOLINE CONSUMPTION

ASSUMES ETHANOL = GASOLINE PER VOLUME

	TOTAL ETHANOL POTENTIAL MM GALLONS	MM GALLONS GASOLINE CONSUMED	NET LIQUID FUEL BALANCE ASSUMING ETOH = GAS
NORTHWEST REPORTING DISTRICT			
BANNER	6.397	1.38	5.022
BOX	29.816	5.50	24.316
CHEYENNE	35.315	9.13	26.190
DAWES	7.063	4.81	2.250
DEUEL	18.732	5.44	13.294
GARDEN	7.727	2.00	5.727
KIMBALL	15.035	7.06	7.972
MORRILL	15.463	5.56	9.901
SCOTTS	13.946	16.00	-2.054
SHERIDAN	10.022	4.81	5.209
SIoux	2.513	2.06	0.451
NORTH REPORTING DISTRICT			
ARTHUR	0.000	0.44	-0.438
BLAINE	0.327	0.88	-0.548
BOYD	5.582	1.44	4.144
BROWN	7.392	2.19	5.204
CHERRY	0.294	5.50	-5.206
GARFIELD	1.882	1.19	0.694
GRANT	0.000	0.81	-0.813
HOLT	25.061	7.81	17.248
HOOKER	0.000	0.75	-0.750
KEYA	0.663	0.69	-0.025
LOGAN	5.828	1.06	4.766
LOUP	0.376	0.75	-0.374
MCPHERSO	0.000	0.44	-0.438
ROCK	0.228	1.63	-1.397
THOMAS	0.017	1.19	-1.170
WHEELER	0.342	1.13	-0.783
NORTHEAST REPORTING DISTRICT			
ANTELOPE	57.553	5.00	52.553
BOONE	44.625	3.50	41.125
BURT	40.585	4.56	36.023
CEDAR	30.644	6.19	24.457

TABLE 23. CONTINUED

	TOTAL ETHANOL POTENTIAL MM GALLONS	MM GALLONS GASOLINE CONSUMED	NET LIQUID FUEL BALANCE ASSUMING ETOH = GAS
CUMING	9.903	6.31	3.590
DAKOTA	18.461	8.75	9.711
DIXON	20.128	3.06	17.066
KNOX	12.346	4.50	7.846
MADISON	30.462	12.94	17.524
PIERCE	29.674	5.00	24.674
STANTON	11.522	4.25	7.272
THURSTON	23.559	3.31	20.247
WAYNE	21.275	4.44	16.837

CENTRAL REPORTING DISTRICT

BUFFALO	80.915	23.38	57.540
CUSTER	67.165	7.75	59.415
DAWSON	49.651	19.50	30.151
GREELEY	10.671	2.00	8.671
HALL	74.794	27.56	47.232
HOWARD	38.756	4.19	34.569
SHERMAN	16.069	2.63	13.444
VALLEY	21.357	2.88	18.482

EAST REPORTING DISTRICT

BUTLER	63.252	5.69	57.565
CASS	34.784	15.75	19.034
COLFAX	20.943	4.88	16.068
DODGE	49.199	16.00	33.199
DOUGLAS	17.502	174.56	-157.061
HAMILTON	115.740	11.44	104.303
LANCASTE	45.100	85.50	-40.400
MERRICK	58.612	6.13	52.487
NANCE	28.033	2.06	25.970
PLATTE	58.522	13.69	44.835
POLK	56.856	3.44	53.418
SARPY	9.172	38.25	-29.078
SAUNDERS	38.166	10.25	27.916
SEWARD	60.016	15.81	44.204
WASHINGT	25.447	7.75	17.697
YORK	108.310	14.69	93.623

SOUTHWEST REPORTING DISTRICT

CHASE	63.493	2.94	60.556
DUNDY	40.220	1.88	38.345
FRONTIER	38.168	2.38	35.793

TABLE 23. CONTINUED

	TOTAL ETHANOL POTENTIAL MM GALLONS	MM GALLONS GASOLINE CONSUMED	NET LIQUID FUEL BALANCE ASSUMING ETOH = GAS
HAYES	15.001	1.06	13.939
HITCHCOC	27.972	2.81	25.159
KEITH	27.044	14.13	12.919
LINCOLN	61.667	26.44	35.229
PERKINS	73.111	2.25	70.861
RED	31.077	6.06	25.014
SOUTH REPORTING DISTRICT			
ADAMS	81.277	11.38	69.902
FRANKLIN	42.167	2.50	39.667
FURNAS	40.334	3.56	36.771
GOSPER	35.607	1.75	33.857
HARLAN	37.577	3.13	34.452
KEARNEY	77.335	4.94	72.398
PHELPS	78.335	5.13	73.210
WEBSTER	30.592	2.50	28.092
SOUTHEAST REPORTING DISTRICT			
CLAY	75.686	4.13	71.561
FILLMORE	86.732	4.63	82.107
GAGE	52.832	11.44	41.395
JEFFERSO	38.666	4.81	33.854
JOHNSON	13.547	2.81	10.734
NEMAHA	21.483	4.56	16.920
NUCKOLLS	44.475	3.19	41.287
OTOE	33.741	8.81	24.929
PAWNEE	12.105	2.13	9.980
RICHARDS	22.091	4.88	17.216
SALINE	57.135	6.06	51.073
THAYER	59.238	4.25	54.988
NEBRASKA	2936.439	835.688	2100.752

TABLE 24.

COMPARISON OF UTILIZATION OF CORN RESIDUES
TO PRODUCE ETHANOL OR METHANOL FOR LIQUID FUEL

	TOTAL POUNDS CORN RESIDUE HARVESTABLE	POTENTIAL ETOH FROM RESIDUE GALLONS	POTENTIAL MEOH FROM RESIDUE GALLONS
NORTHWEST REPORTING DISTRICT			
BANNER	16213120	356689	885236
BOX	152246528	3349424	8312660
CHEYENNE	42194880	928287	2303840
DAWES	1514688	33323	82702
DEUEL	44493568	978858	2429349
GARDEN	3760848	82739	205342
KIMBALL	17135104	376972	935577
MORRILL	183267056	4031875	10006381
SCOTTS	119773248	2635011	6539619
SHERIDAN	81388608	1790549	4443818
SIoux	4628736	101832	252729
NORTH REPORTING DISTRICT			
ARTHUR	0	0	0
BLAINE	13607104	299356	742948
BOYD	46890256	1031586	2560208
BROWN	111094368	2444076	6065752
CHERRY	1887872	41533	103078
GARFIELD	46489632	1022772	2538334
GRANT	0	0	0
HOLT	205214352	4514716	11204704
HOOKEr	0	0	0
KEYA	15821120	348065	863833
LOGAN	66035536	1452782	3605540
LOUP	17099040	376179	933608
MCPHERSO	0	0	0
ROCK	10349976	227699	565109
THOMAS	181888	4002	9931
WHEELER	5488000	120736	299645
NORTHEAST REPORTING DISTRICT			
ANTELOPE	410665864	9034649	22422356
BOONE	434109424	9550407	23702375
BURT	424882528	9347416	23198586
CEDAR	338291296	7442409	18470705

TABLE 24. CONTINUED

	TOTAL POUNDS OF RESIDUE HARVESTABLE	POTENTIAL ETOH FROM RESIDUE	POTENTIAL MEOH FROM RESIDUE
CUMING	442439424	9733667	24157193
DAKOTA	159536944	3509813	8710717
DIXON	244309296	5374805	13339288
KNOX	209899536	4617790	11460515
MADISON	296050552	6513112	16164360
PIERCE	271277720	5968110	14811764
STANTON	209265672	4603845	11425906
THURSTON	207247264	4559440	11315701
WAYNE	271582304	5974811	14828394

CENTRAL REPORTING DISTRICT

BUFFALO	834260672	18353735	45550633
CUSTER	688866304	15155059	37612100
DAWSON	952697200	20959338	52017267
GREELEY	90364624	1988022	4933908
HALL	733706400	16141541	40060369
HOWARD	336985152	7413673	18399389
SHERMAN	146524112	3223530	8000217
VALLEY	216750912	4768520	11834600

EAST REPORTING DISTRICT

BUTLER	525784896	11567268	28707855
CASS	269683456	5933036	14724717
COLFAX	310656080	6834434	16961822
DODGE	504116704	11090567	27524772
DOUGLAS	141096480	3104123	7703868
HAMILTON	1119283088	24624228	61112857
LANCASTE	63833280	1404332	3485297
MERRICK	489328896	10765236	26717358
NANCE	238900480	5255811	13043966
PLATTE	492012528	10824276	26863884
POLK	536099200	11794182	29271016
SARPY	140971432	3101372	7697040
SAUNDERS	451427200	9931398	24647925
SEWARD	382298000	8410556	20873471
WASHINGT	266028448	5852626	14525153
YORK	990415440	21789140	54076683

SOUTHWEST REPORTING DISTRICT

CHASE	527420320	11603247	28797149
DUNDY	174203232	3832471	9511496
FRONTIER	242070976	5325561	13217075
HAYES	125890800	2769598	6873638

TABLE 24. CONTINUED

	TOTAL POUNDS OF RESIDUE HARVESTABLE	POTENTIAL ETOH FROM RESIDUE	POTENTIAL MEOH FROM RESIDUE
HITCHCOC	131696320	2897319	7190619
KEITH	204213184	4492690	11150040
LINCOLN	498867040	10975075	27238140
PERKINS	406893648	8951660	22216393
RED	175716352	3865760	9594113
SOUTH REPORTING DISTRICT			
ADAMS	718361952	15803963	39222563
FRANKLIN	283882480	6245415	15499983
FURNAS	204253952	4493587	11152266
GOSPER	271812800	5979882	14840979
HARLAN	260758400	5736685	14237409
KEARNEY	785497832	17280952	42888182
PHELPS	969030272	21318666	52909053
WEBSTER	126841792	2790519	6925562
SOUTHEAST REPORTING DISTRICT			
CLAY	611675232	13456855	33397468
FILLMORE	588333984	12943348	32123036
GAGE	130880960	2879381	7146100
JEFFERSO	146698160	3227360	8009720
JOHNSON	23600360	519208	1288580
NEMAHA	155068928	3411516	8466763
NUCKOLLS	180104400	3962297	9833700
OTOE	196551936	4324143	10731736
PAWNEE	18992400	417833	1036985
RICHARDS	168977088	3717496	9226149
SALINE	232169840	5107736	12676473
THAYER	346275552	7618062	18906645

TABLE 25.

COMPARISON OF UTILIZATION OF SORGHUM RESIDUES
TO PRODUCE ETHANOL OR METHANOL FOR LIQUID FUEL

	TOTAL SORGHUM RESIDUE POUNDS	POTENTIAL ETOH FROM RESIDUE GALLONS	POTENTIAL MEOH FROM RESIDUE GALLONS
NORTHWEST REPORTING DISTRICT			
BANNER	849072	51793	46359
BOX	121296	7399	6623
CHEYENNE	1034208	63087	56468
DAWES	485184	29596	26491
DEUEL	1557696	95019	85050
GARDEN	727776	44394	39737
KIMBALL	344736	21029	18823
MORRILL	606480	36995	33114
SCOTTS	43092	2629	2353
SHERIDAN	606480	36995	33114
SIOUX	363888	22197	19868
NORTH REPORTING DISTRICT			
ARTHUR	0	0	0
BLAINE	0	0	0
BOYD	14115024	861016	770680
BROWN	427728	26091	23354
CHERRY	641592	39137	35031
GARFIELD	252168	15382	13768
GRANT	0	0	0
HOLT	133665	8154	7298
HOOKER	0	0	0
KEYA	427728	26091	23354
LOGAN	0	0	0
LOUP	0	0	0
MCPHERSO	0	0	0
ROCK	0	0	0
THOMAS	0	0	0
WHEELER	0	0	0
NORTHEAST REPORTING DISTRICT			
ANTELOPE	55062	3359	3006
BOONE	605682	36947	33070
BURT	0	0	0
CEDAR	55062	3359	3006

TABLE 25. CONTINUED

	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUE	POTENTIAL MEOH FROM RESIDUE
CUMING	175161	10685	9564
DAKOTA	0	0	0
DIXON	27531	1679	1503
KNOX	6387192	389619	348741
MADISON	27531	1679	1503
PIERCE	55062	3359	3006
STANTON	55062	3359	3006
THURSTON	0	0	0
WAYNE	27531	1679	1503

CENTRAL REPORTING DISTRICT

BUFFALO	14897064	908721	813380
CUSTER	2081982	127001	113676
DAWSON	3726660	227326	203476
GREELEY	0	0	0
HALL	7319256	446475	399631
HOWARD	3686760	224892	201297
SHERMAN	6036072	368200	329570
VALLEY	3302922	201478	180340

EAST REPORTING DISTRICT

BUTLER	67993191	4147585	3712428
CASS	6445446	393172	351921
COLFAX	807975	49286	44115
DODGE	1797894	109672	98165
DOUGLAS	34713	2117	1895
HAMILTON	52269000	3188409	2853887
LANCASTE	163437183	9969668	8923670
MERRICK	1586424	96772	86619
NANCE	20425608	1245962	1115238
PLATTE	682290	41620	37253
POLK	96210870	5868863	5253114
SARPY	173565	10587	9477
SAUNDERS	6534024	398575	356758
SEWARD	142748634	8707667	7794075
WASHINGT	177555	10831	9695
YORK	101239866	6175632	5527697

SOUTHWEST REPORTING DISTRICT

CHASE	3862320	235602	210883
DUNDY	13444704	820127	734081
FRONTIER	42906864	2617319	2342715
HAYES	7817208	476850	426820

TABLE 25. CONTINUED

	TOTAL HARVESTABLE RESIDUE	POTENTIAL ETOH FROM RESIDUE	POTENTIAL MEOH FROM RESIDUE
HITCHCOC	34939632	2131318	1907704
KEITH	2611056	159274	142564
LINCOLN	2531256	154407	138207
PERKINS	2397192	146229	130887
RED	53232984	3247212	2906521
SOUTH REPORTING DISTRICT			
ADAMS	80301144	4898370	4384442
FRANKLIN	73562832	4487333	4016531
FURNAS	83253744	5078478	4545654
GOSPER	36510096	2227116	1993451
HARLAN	67322472	4106671	3675807
KEARNEY	33321288	2032599	1819342
PHELPS	15474018	943915	844881
WEBSTER	83174742	5073659	4541341
SOUTHEAST REPORTING DISTRICT			
CLAY	101612931	6198389	5548066
FILLMORE	119553966	7292792	6527647
GAGE	199556259	12172932	10895772
JEFFERSO	141795024	8649496	7742008
JOHNSON	34225821	2087775	1868730
NEMAHA	4705008	287005	256893
NUCKOLLS	163433592	9969449	8923474
OTOE	16467528	1004519	899127
PAWNEE	23620800	1440869	1289696
RICHARDS	7530327	459350	411156
SALINE	205497768	12535364	11220178
THAYER	119966931	7317983	6550194
NEBRASKA	2508453150	153015642	136961542

TABLE 26.

UTILIZATION OF ALL GRAIN RESIDUES TO PRODUCE METHANOL
USING GASIFICATION AND METHANOL SYNTHESIS TECHNOLOGIES

	MEOH FROM CORN RESIDUE GALLONS	MEOH FROM SORGHUM RESIDUE GALLONS	MEOH FROM WHEAT RESIDUE GALLONS	MEOH FROM BARLEY RESIDUE GALLONS	TOTAL MEOH POTENTIAL FROM GRAIN RESIDUES
NORTHWEST REPORTING DISTRICT					
BANNER	885236	46359	1359689	1359689	3650975
BOX	8312660	6623	8920950	8920950	26161182
CHEYENNE	2303840	56468	24805409	24805409	51971127
DAWES	82702	26491	5001092	5001092	10111377
DEUEL	2429349	85050	10367870	10367870	23250139
GARDEN	205342	39737	5380164	5380164	11005408
KIMBALL	935577	18823	5215986	5215986	11386371
MORRILL	10006381	33114	3291712	3291712	16622918
SCOTTS	6539619	2353	122040	122040	6786052
SHERIDAN	4443818	33114	5762494	5762494	16001921
SIOUX	252729	19868	642380	642380	1557357
NORTH REPORTING DISTRICT					
ARTHUR	0	0	0	0	0
BLAINE	742948	0	21027	21027	785001
BOYD	2560208	770680	255163	255163	3841215
BROWN	6065752	23354	21027	21027	6131160
CHERRY	103078	35031	114314	114314	366737
GARFIELD	2538334	13768	36160	36160	2624422
GRANT	0	0	0	0	0
HOLT	11204704	7298	52408	52408	11316817
HOOKER	0	0	0	0	0
KEYA	863833	23354	184798	184798	1256783
LOGAN	3605540	0	256985	256985	4119509
LOUP	933608	0	0	0	933608
MCPHERSO	0	0	0	0	0
ROCK	565109	0	0	0	565109
THOMAS	9931	0	10069	10069	30069
WHEELER	299645	0	0	0	299645
NORTHEAST REPORTING DISTRICT					
ANTELOPE	22422356	3006	7663	7663	22440688
BOONE	23702375	33070	44874	44874	23825193
BURT	23198586	0	0	0	23198586
CEDAR	18470705	3006	4476	4476	18482662

TABLE 26. CONTINUED

	MEOH FROM CORN RESIDUE	MEOH FROM SORGHUM RESIDUE	MEOH FROM WHEAT RESIDUE	MEOH FROM BARLEY RESIDUE	TOTAL MEOH POTENTIAL FROM GRAIN
CUMING	24157193	9564	4476	4476	24175707
DAKOTA	8710717	0	0	0	8710717
DIXON	13339288	1503	2887	2887	13346566
KNOX	11460515	348741	226762	226762	12262780
MADISON	16164360	1503	6219	6219	16178302
PIERCE	14811764	3006	6219	6219	14827208
STANTON	11425906	3006	14585	14585	11458083
THURSTON	11315701	0	0	0	11315701
WAYNE	14828394	1503	7219	7219	14844334
CENTRAL REPORTING DISTRICT					
BUFFALO	45550633	813380	1675974	1675974	49715961
CUSTER	37612100	113676	3201030	3201030	44127837
DAWSON	52017267	203476	789448	789448	53799639
GREELEY	4933908	0	0	0	4933908
HALL	40060369	399631	437000	437000	41334000
HOWARD	18399389	201297	545627	545627	19691941
SHERMAN	8000217	329570	448135	448135	9226056
VALLEY	11834600	180340	683141	683141	13381222
EAST REPORTING DISTRICT					
BUTLER	28707855	3712428	122939	122939	32666162
CASS	14724717	351921	292822	292822	15662283
COLFAX	16961822	44115	52774	52774	17111485
DODGE	27524772	98165	29541	29541	27682019
DOUGLAS	7703868	1895	8951	8951	7723665
HAMILTON	61112857	2853887	505640	505640	64978024
LANCASTE	3485297	8923670	788515	788515	13985998
MERRICK	26717358	86619	101543	101543	27007062
NANCE	13043966	1115238	867573	867573	15894350
PLATTE	26863884	37253	63957	63957	27029052
POLK	29271016	5253114	43408	43408	34610946
SARPY	7697040	9477	16807	16807	7740130
SAUNDERS	24647925	356758	134752	134752	25274187
SEWARD	20873471	7794075	211096	211096	29089738
WASHINGT	14525153	9695	35164	35164	14605176
YORK	54076683	5527697	135966	135966	59876312
SOUTHWEST REPORTING DISTRICT					
CHASE	28797149	210883	6241636	6241636	41491305
DUNDY	9511496	734081	4681249	4681249	19608076
FRONTIER	13217075	2342715	5753758	5753758	27067306
HAYES	6873638	426820	5906542	5906542	19113541

TABLE 26. CONTINUED

	MEOH FROM CORN RESIDUE	MEOH FROM SORGHUM RESIDUE	MEOH FROM WHEAT RESIDUE	MEOH FROM BARLEY RESIDUE	TOTAL MEOH POTENTIAL FROM GRAIN
HITCHCOC	7190619	1907704	9189843	9189843	27478009
KEITH	11150040	142564	8485864	8485864	28264331
LINCOLN	27238140	138207	4005760	4005760	35387867
PERKINS	22216393	130887	16924196	16924196	56195671
RED	9594113	2906521	8553653	8553653	29607939
SOUTH REPORTING DISTRICT					
ADAMS	39222563	4384442	4329867	4329867	52266739
FRANKLIN	15499983	4016531	3118286	3118286	25753086
FURNAS	11152266	4545654	8611580	8611580	32921080
GOSPER	14840979	1993451	2046873	2046873	20928176
HARLAN	14237409	3675807	4715040	4715040	27343296
KEARNEY	42888182	1819342	2884505	2884505	50476534
PHELPS	52909053	844881	1099606	1099606	55953147
WEBSTER	6925562	4541341	5003824	5003824	21474550
SOUTHEAST REPORTING DISTRICT					
CLAY	33397468	5548066	1597346	1597346	42140227
FILLMORE	32123036	6527647	2750201	2750201	44151083
GAGE	7146100	10895772	557114	557114	19156101
JEFFERSO	8009720	7742008	3249244	3249244	22250215
JOHNSON	1288580	1868730	180652	180652	3518613
NEMAHA	8466763	256893	232478	232478	9188613
NUCKOLLS	9833700	8923474	3757556	3757556	26272287
OTOE	10731736	899127	357690	357690	12346244
PAWNEE	1036985	1289696	128244	128244	2583169
RICHARDS	9226149	411156	175913	175913	9989132
SALINE	12676473	11220178	2040380	2040380	27977411
THAYER	18906645	6550194	4551913	4551913	34560666
NEBRASKA	1362551983	136961542	204469736	204469736	1908452998

TABLE 27.

POTENTIAL FOR METHANOL PRODUCTION FROM FEEDLOT WASTES
 USING GASIFICATION AND METHANOL SYNTHESIS TECHNOLOGIES

	TOTAL FEEDLOT MANURE TONS	MEOH FROM FEEDLOT MANURE GALLONS
NORTHWEST REPORTING DISTRICT		
BANNER	3675	401310
BOX	8575	936390
CHEYENNE	7679	838509
DAWES	0	0
DEUEL	0	0
GARDEN	7652	835585
KIMBALL	0	0
MORRILL	17303	1889501
SCOTTS	35922	3922681
SHERIDAN	2756	300983
SIOUX	4288	468195
NORTH REPORTING DISTRICT		
ARTHUR	0	0
BLAINE	1269	138614
BOYD	289	31532
BROWN	8110	885605
CHERRY	0	0
GARFIELD	3369	367868
GRANT	0	0
HOLT	18234	1991109
HOOKER	175	19110
KEYA	0	0
LOGAN	613	66885
LOUP	613	66885
MCPHERSON	0	0
ROCK	3063	334425
THOMAS	0	0
WHEELER	15313	1672125
NORTHEAST REPORTING DISTRICT		
ANTELOPE	15441	1686123
BOONE	8475	925440
BURT	9397	1026169
CEDAR	3797	414601

TABLE 27. CONTINUED

	TOTAL FEEDLOT MANURE	MEOH FROM FEEDLOT MANURE
CUMING	61704	6738129
DAKOTA	1838	200655
DIXON	6173	674105
KNOX	8294	905709
MADISON	3894	425188
PIERCE	3329	363520
STANTON	17420	1902248
THURSTON	1389	151667
WAYNE	2580	281681
CENTRAL REPORTING DISTRICT		
BUFFALO	13111	1431721
CUSTER	2841	310260
DAWSON	53038	5791696
GREELEY	3084	336737
HALL	5525	603312
HOWARD	7098	775054
SHERMAN	0	0
VALLEY	7461	814784
EAST REPORTING DISTRICT		
BUTLER	3460	377786
CASS	1991	217376
COLFAX	14186	1549085
DODGE	6475	707080
DOUGLAS	1499	163639
HAMILTON	6433	702503
LANCASTE	782	85403
MERRICK	14241	1555076
NANCE	1194	130426
PLATTE	11139	1216399
POLK	21858	2386839
SARPY	10904	1190744
SAUNDERS	14866	1623347
SEWARD	5114	558423
WASHINGT	5595	611004
YORK	5646	616536
SOUTHWEST REPORTING DISTRICT		
CHASE	8631	942524
DUNDY	1059	115616
FRONTIER	0	0
HAYES	6738	735735

TABLE 27. CONTINUED

	TOTAL FEEDLOT MANURE	MEOH FROM FEEDLOT MANURE
HITCHCOC	788	85995
KEITH	3675	401310
LINCOLN	6249	682437
PERKINS	674	73574
RED	4942	539695
SOUTH REPORTING DISTRICT		
ADAMS	16004	1747638
FRANKLIN	1776	193967
FURNAS	1838	200655
GOSPER	1838	200655
HARLAN	3369	367868
KEARNEY	10241	1118317
PHELPS	26628	2907825
WEBSTER	1838	200655
SOUTHEAST REPORTING DISTRICT		
CLAY	22509	2457947
FILLMORE	7212	787600
GAGE	3189	348194
JEFFERSO	3397	370925
JOHNSON	1607	175506
NEMAHA	2094	228689
NUCKOLLS	1030	112462
OTOE	3422	373648
PAWNEE	3232	352962
RICHARDS	2753	300581
SALINE	1769	193221
THAYER	5930	647552
NEBRASKA	654593	71481528

TABLE 28.

POTENTIAL FOR UTILIZATION OF CROP RESIDUES AND FEEDLOT
 MANURE FOR SYNTHETIC NATURAL GAS BY ANAEROBIC DIGESTION
 COMPARED WITH ESTIMATED ANNUAL NATURAL GAS USEAGE

	TONS OF MANURE	TONS OF RESIDUES	METHANE MM CUBIC FT	NATURAL GAS EST'D USAGE
NORTHWEST REPORTING DISTRICT				
BANNER	3675	33434	29	57
BOX	8575	239571	69	832.2
CHEYENNE	7679	475926	63	575.7
DAWES	0	92595	0	530.1
DEUEL	0	212913	1	136.8
GARDEN	7652	100782	61	159.6
KIMBALL	0	104271	0	273.6
MORILL	17303	152225	139	330.6
SCOTTS	35922	62143	288	2160.3
SHERIDAN	2756	146538	22	416.1
SIOUX	4288	14262	34	96.9
NORTH REPORTING DISTRICT				
ARTHUR	0	0	0	28.5
BLAINE	1269	7189	10	39.9
BOYD	289	35176	2	176.7
BROWN	8110	56146	65	233.7
CHERRY	0	3358	0	387.6
GARFIELD	3369	24033	27	125.4
GRANT	0	0	0	51.3
HOLT	18234	103634	146	769.5
HOOKER	175	0	1	57
KEYA	0	11509	0	68.4
LOGAN	613	37724	5	51.3
LOUP	613	8550	5	45.6
MCPHERSO	0	0	0	34.2
ROCK	3063	5175	25	131.1
THOMAS	0	275	0	51.3
WHEELER	15313	2744	123	57
NORTHEAST REPORTING DISTRICT				
ANTELOPE	15441	205501	124	478.8
BOONE	8475	218179	68	404.7
BURT	9397	212441	76	478.8
CEDAR	3797	169255	31	621.3
CUMING	61704	221389	494	632.7
DAKOTA	1838	79768	15	986.1
DIXON	6173	122221	50	381.9

TABLE 28. CONTINUED

	MANURE	RESIDUES	METHANE	GAS USE
KNOX	8294	112297	67	621.3
MADISON	3894	148153	32	1835.4
PIERCE	3329	135780	27	478.8
STANTON	17420	104927	140	370.5
THURSTON	1389	103624	11	404.7
WAYNE	2580	135937	21	547.2
CENTRAL REPORTING DISTRICT				
BUFFALO	13111	455274	106	2097.6
CUSTER	2841	404101	24	746.7
DAWSON	53038	492671	426	1197
GREELEY	3084	45182	25	188.1
HALL	5525	378516	45	2787.3
HOWARD	7098	180329	57	370.5
SHERMAN	0	84488	0	228
VALLEY	7461	122539	60	330.6
EAST REPORTING DISTRICT				
BUTLER	3460	299141	28	518.7
CASS	1991	143427	16	1248.3
COLFAX	14186	156699	114	541.5
DODGE	6475	253498	52	2006.4
DOUGLAS	1499	70730	12	23649.3
HAMILTON	6433	595037	53	518.7
LANCASTE	782	128077	7	11747.7
MERRICK	14241	247317	115	490.2
NANCE	1194	145553	10	256.5
PLATTE	11139	247519	90	1681.5
POLK	21858	316950	176	342
SARPY	10904	70880	87	5449.2
SAUNDERS	14866	231449	120	1060.2
SEWARD	5114	266390	42	894.9
WASHINGT	5595	133747	45	900.6
YORK	5646	548318	47	849.3
SOUTHWEST REPORTING DISTRICT				
CHASE	8631	379957	70	262.2
DUNDY	1059	179561	9	159.6
FRONTIER	0	247869	1	199.5
HAYES	6738	175032	54	79.8
HITCHCOC	788	251630	7	222.3
KEITH	3675	258831	30	507.3
LINCOLN	6249	324065	51	1920.9
PERKINS	674	514612	7	210.9
RED	4942	271135	40	729.6

TABLE 28. CONTINUED

	MANURE	RESIDUE	METHANE	GAS USE
SOUTH REPORTING DISTRICT				
ADAMS	16004	478633	129	1761.3
FRANKLIN	1776	235834	15	233.7
FURNAS	1838	301475	15	353.4
GOSPER	1838	191650	15	119.7
HARLAN	3369	250396	28	233.7
KEARNEY	10241	462239	83	381.9
PHELPS	26628	512391	214	570
WEBSTER	1838	196653	15	267.9
SOUTHEAST REPORTING DISTRICT				
CLAY	22509	385900	181	433.2
FILLMORE	7212	404314	59	421.8
GAGE	3189	175422	26	1339.5
JEFFERSON	3397	203757	28	530.1
JOHNSON	1607	32222	13	279.3
NEMAHA	2094	84145	17	473.1
NUCKOLLS	1030	240589	9	370.5
OTOE	3422	113061	28	837.9
PAWNEE	3232	23655	26	210.9
RICHARDS	2753	91476	22	592.8
SALINE	1769	256203	15	741
THAYER	5930	316490	48	410.4
SUMMARY TOTAL				
NEBRASKA	654593	17476676	5283	91086

TABLE 29.

POTENTIAL FOR UTILIZATION OF CROP RESIDUES AND FEEDLOT
MANURE FOR ELECTRICAL POWER GENERATION BY DIRECT COMBUSTION
COMPARED WITH ESTIMATED ANNUAL ELECTRICAL USEAGE

	TONS OF MANURE	TONS OF RESIDUES	ELECTRICITY MM kWhr	EST'D POWER USAGE
NORTHWEST REPORTING DISTRICT				
BANNER	3675	33434	131	10
BOX	8575	239571	878	153
CHEYENNE	7679	475926	1712	106
DAWES	0	92595	328	98
DEUEL	0	212913	754	25
GARDEN	7652	100782	384	29
KIMBALL	0	104271	369	50
MORILL	17303	152225	600	61
SCOTTS	35922	62143	347	398
SHERIDAN	2756	146538	529	77
SIOUX	4288	14262	66	18
NORTH REPORTING DISTRICT				
ARTHUR	0	0	0	5
BLAINE	1269	7189	30	7
BOYD	289	35176	126	33
BROWN	8110	56146	227	43
CHERRY	0	3358	12	71
GARFIELD	3369	24033	97	23
GRANT	0	0	0	9
HOLT	18234	103634	431	142
HOOKER	175	0	1	10
KEYA	0	11509	41	13
LOGAN	613	37724	136	9
LOUP	613	8550	32	8
MCPHERSO	0	0	0	6
ROCK	3063	5175	29	24
THOMAS	0	275	1	9
WHEELER	15313	2744	64	10
NORTHEAST REPORTING DISTRICT				
ANTELOPE	15441	205501	782	88
BOONE	8475	218179	802	74
BURT	9397	212441	785	88
CEDAR	3797	169255	613	114
CUMING	61704	221389	1002	116
DAKOTA	1838	79768	289	181
DIXON	6173	122221	455	70

TABLE 29. CONTINUED

	MANURE	RESIDUES	POWER	EST'D USE
KNOX	8294	112297	427	114
MADISON	3894	148153	538	338
PIERCE	3329	135780	492	88
STANTON	17420	104927	433	68
THURSTON	1389	103624	372	74
WAYNE	2580	135937	490	101
CENTRAL REPORTING DISTRICT				
BUFFALO	13111	455274	1658	386
CUSTER	2841	404101	1441	137
DAWSON	53038	492671	1932	220
GREELEY	3084	45182	171	35
HALL	5525	378516	1360	513
HOWARD	7098	180329	663	68
SHERMAN	0	84488	299	42
VALLEY	7461	122539	460	61
EAST REPORTING DISTRICT				
BUTLER	3460	299141	1071	95
CASS	1991	143427	515	230
COLFAX	14186	156699	605	100
DODGE	6475	253498	920	369
DOUGLAS	1499	70730	256	4352
HAMILTON	6433	595037	2129	95
LANCASTE	782	128077	456	2162
MERRICK	14241	247317	926	90
NANCE	1194	145553	519	47
PLATTE	11139	247519	916	309
POLK	21858	316950	1199	63
SARPY	10904	70880	290	1003
SAUNDERS	14866	231449	872	195
SEWARD	5114	266390	961	165
WASHINGTON	5595	133747	493	166
YORK	5646	548318	1961	156
SOUTHWEST REPORTING DISTRICT				
CHASE	8631	379957	1376	45
DUNDY	1059	179561	639	29
FRONTIER	0	247869	877	37
HAYES	6738	175032	643	15
HITCHCOC	788	251630	894	41
KEITH	3675	258831	929	93
LINCOLN	6249	324065	1169	354
PERKINS	674	514612	1824	39
RED	4942	271135	977	134

TABLE 29. CONTINUED

	MANURE	RESIDUE	POWER	EST'D USE
SOUTH REPORTING DISTRICT				
ADAMS	16004	478633	1751	324
FRANKLIN	1776	235834	841	43
FURNAS	1838	301475	1074	65
GOSPER	1838	191650	685	22
HARLAN	3369	250396	898	43
KEARNEY	10241	462239	1673	70
PHELPS	26628	512391	1908	105
WEBSTER	1838	196653	703	49
SOUTHEAST REPORTING DISTRICT				
CLAY	22509	385900	1446	80
FILLMORE	7212	404314	1457	78
GAGE	3189	175422	632	247
JEFFERSO	3397	203757	733	98
JOHNSON	1607	32222	120	51
NEMAHA	2094	84145	305	87
NUCKOLLS	1030	240589	855	68
OTOE	3422	113061	412	154
PAWNEE	3232	23655	95	39
RICHARDS	2753	91476	334	109
SALINE	1769	256203	913	136
THAYER	5930	316490	1141	76
SUMMARY TOTAL				
NEBRASKA	654593	17476676	64185	16763