TEACHING NOTE: THE US ETHANOL INDUSTRY WITH COMMENTS ON THE GREAT PLAINS

ATTACHMENT 3

Prepared by:

SPARKS COMPANIES INC.

and

Kansas State University

May 2002

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. Executive Summary

In 1990, the U.S. Congress passed amendments to the Clean Air Act, establishing two programs to reduce automotive pollution by mandating "cleaner" fuel. The Oxygenated Fuels Program was targeted at reducing carbon monoxide emissions, while the Reformulated Gasoline Program was intended to reduce smog-forming emissions. Ethanol and methyl tertiary butyl ether (MTBE) are the two main oxygenates (i.e., additives that increase the oxygen content in fuel) used to meet the requirements of these programs. The implementation of these two programs has stimulated ethanol demand considerably, and as a result ethanol production has nearly doubled since 1990. A large percentage of this increased production is located in the Great Plains and upper Midwest.

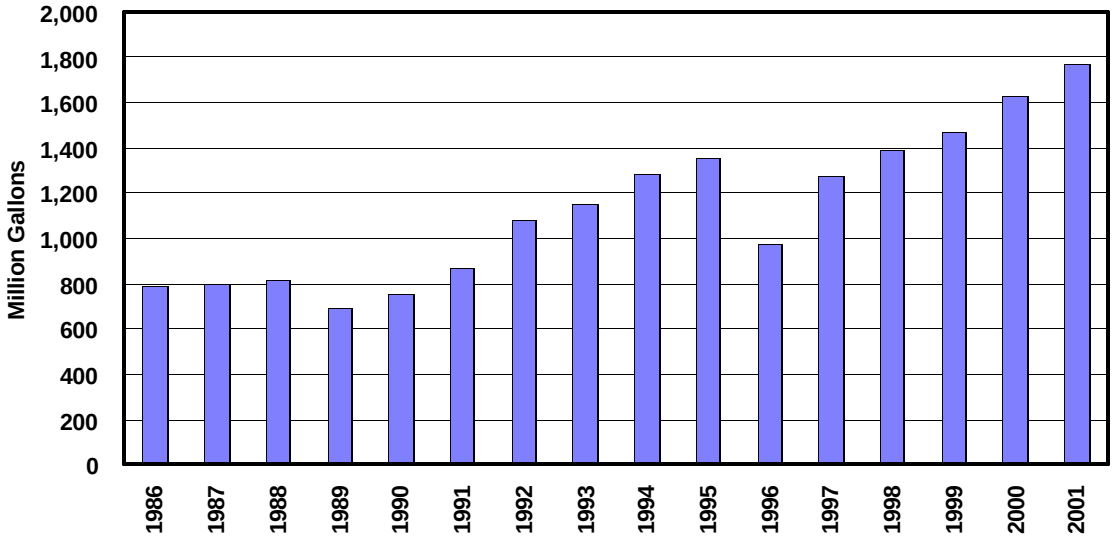
Recently, several U.S. states have taken steps to ban MTBE due to contamination of groundwater and alleged adverse health effects. And, legislation is pending in Congress that would phase out the use of MTBE nationally. Even without a complete prohibition against the use of MTBE, trends that are already in place suggest a modest increase in ethanol consumption over the course of this decade. However, if MTBE is banned and the oxygenate requirements are maintained in the Clean Air Act programs, growth in ethanol consumption could be dramatic. Alternatively, the proposals in Congress for a possible nationwide renewable fuels standard for U.S. gasoline could also result in a sizable increase in ethanol consumption. These forces suggest that the consumption of ethanol may well continue to increase substantially in the coming years. The close proximity to corn, the main feedstock for ethanol, may offer an attractive option for Great Plains producers who wish to look for option value added markets for grain production.

Coming out of the post 9/11 economic slowdown, expectations are for renewed strength in gasoline prices, thus, ethanol prices are expected to remain at or above historical averages unless significant surplus capacity is built. Combined with expectations that corn prices will remain at or below long-term averages, ethanol processing margins are likely to remain at or above historical averages, though not as strong as margins experienced in 2001. Thus, the current outlook is deemed favorable for adding to capacity over the forecast timeframe.

II. Introduction

In the United States, ethanol has been described as a "political commodity," due to the importance of federal government policies that stimulate the production and consumption of ethanol and make it price-competitive in fuel markets. The primary federal incentive has been a partial exemption of ethanol-blended fuels from the federal excise tax on motor fuels. However, even with this partial exemption, fuel ethanol production had begun to level off in the late 1980s (see Figure 1).

Figure 1: Fuel Ethanol Production in the United States



Source: Energy Information Administration and Renewable Fuels Assn.

Then, in 1990, the U.S. Congress passed amendments to the Clean Air Act (referred to as CAA90), establishing two programs to reduce automotive pollution by mandating specifications for "cleaner" fuel. The Oxygenated Fuels Program was targeted at reducing carbon monoxide emissions, while the Reformulated Gasoline Program was intended to reduce smog-forming emissions. Ethanol and methyl tertiary butyl ether (MTBE) are the two main oxygenates (i.e., additives to fuel to increase the oxygen content) used to meet the requirements of these programs. The CAA90 stimulated ethanol demand considerably, and in response ethanol production has nearly doubled. The economics of ethanol production were particularly strong in 2000 and 2001 due to a combination of low corn prices and relatively high gasoline prices. As a result, U.S.

ethanol production reached a record 1.766 billion gallons in 2001 and will be over 2 billion gallons in 2002.

Moreover, several U.S. states have taken steps to ban MTBE, the main competitor against ethanol in the fulfillment of the CAA90 oxygen requirements. These bans have been ordered because of the contamination of groundwater by MTBE in a number of locations, along with allegations that MTBE causes human health problems. Of particular note is California, which is by far the largest gas-consuming state in the country. California has implemented its own statewide reformulated gasoline program, though 70% of the state's gasoline consumption is in metropolitan areas that would otherwise have been subject to the federal CAA90 programs. California had banned the use of MTBE after December 31, 2002, however the ban was delayed by one year because of concerns over switching costs from MTBE to ethanol. California had requested a waiver from the federal oxygenate standard (as of this writing the ban was delayed one year). This request was denied by the Environmental Protection Agency (EPA) in the summer of 2001.

As a result of the favorable processing margins and policy developments in the U.S., during 2000 and most of 2001a number of producer cooperatives and companies are implementing or considering the construction of new ethanol facilities and/or the expansion of existing facilities. The Great Plains region (roughly defined as the plains states west of the Mississippi from North Dakota to Texas), due to attractive economics versus other regions, will garner a large share of this expected increase in production capacity.

III. United States Policy Environment

A. BACKGROUND

The economic and political shocks from the OPEC oil embargoes in 1973 and 1979 generated widespread political pressure in the United States to reduce dependence on imported petroleum. Concerns about exploitation by the petroleum cartel generated a broad range of proposals for new energy sources, including domestic production from renewable resources. These programs involved primarily federal research, including federal support for a wide variety of regional and state projects. The United States Department of Agriculture (USDA), in conjunction with the U.S. Department of Energy (DOE) and the land-grant university system, developed a large number of research projects to utilize grain products and animal/crop wastes, and to test many other approaches. Subsidies for the construction of facilities to produce energy became widespread, including concessional interest rates and grants.

When petroleum costs were high in the 1970s and early 1980s, enthusiasm for these programs was strong, especially in the farm community, which saw them as a new and potentially large source of demand for farm and forest products. However, petroleum costs declined in the mid to late 1980s and 1990s, and products from renewable resources became increasingly less competitive. As a result, production of some forms of renewable energy were abandoned, except where supported by subsidies. For ethanol, program funding and product usage continued mainly through support from the energy research community and the agricultural lobby.

By the late 1980s, the debate over use of renewable fuels had changed significantly. Pressure from environmentalists and others for cleaner air led to requirements for oxygenates to be used in automotive fuels, in order to reduce pollution. In 1990, Congress passed amendments to the Clean Air Act (CAA90), establishing two programs to reduce pollution from automotive emissions. Whereas previous legislative and administrative pollution-control requirements had focused mainly on creating more fuel-efficient cars, the CAA90 focused on the composition of cleaner burning automotive fuel.

B. CLEAN AIR ACT AMENDMENTS OF 1990

The CAA90 created two programs mandating changes in fuel composition, in order to address two distinct pollution problems: the Oxygenated Fuels (OXY) Program aimed at

carbon monoxide, and the Reformulated Gasoline (RFG) Program targeted at smog-forming emissions. This created a new market for ethanol as an oxygenate.

1. Oxygenated Fuels Program

The OXY Program took effect in November 1992. The program is mandated for all metropolitan statistical areas designated by the U.S. Environmental Protection Agency (EPA) as being in non-attainment for carbon monoxide. Thirty-nine metropolitan areas were originally slated to participate in the program, though less than half now remain in the program, since several have been re-designated as no longer being in non-attainment (i.e., they have met carbon monoxide emission standards). The program was implemented by the individual states in which the program areas are located. Gasoline sold in a program area must have a minimum average oxygen content of 2.7% by weight. However, by averaging, a company may sell some quantities of gasoline containing less than 2.7% so long as it sells enough gasoline containing greater than the required amount to bring the average for the total volume of fuel it sells up to 2.7%. The EPA recommended a 2.0% minimum oxygen content requirement. The oxygen requirement is in effect in each program area during its high ambient carbon monoxide period, defined to last at least four months, which span the winter months in most cities.. This period is referred to as the control period. The EPA has established the specific control period for each program area.

2. Reformulated Gasoline Program

The RFG Program is targeted at reducing ground-level ozone pollution (i.e., smog) and lowering the levels of toxic and aromatic substances in gasoline. It took effect on January 1, 1995. Ten metropolitan areas with severe smog problems are required to participate in the program. The original areas included Los Angeles, New York, Chicago, Houston, Milwaukee, Baltimore, San Diego, Philadelphia and Hartford. Sacramento was more recently added to the program areas. Other areas designated as being in serious, moderate or marginal ozone nonattainment were allowed to apply to opt into the program. The program is in effect year-round (i.e., the control period is 12 months). The RFG program is implemented at the federal level, rather than at the state level. Gasoline sold in a program area must have a minimum average oxygen content of 2.0% by weight.

During Phase I of the RFG program, which lasted from 1995 through 1999, volatile organic compounds (VOCs) and toxic substances had to be reduced 15% compared to conventional gasoline. Emissions of nitrogen oxides (NOx) from RFG had to be no

greater than they were from conventional gasoline. The aromatic hydrocarbon content of RFG had to average no more than 25%.

Under Phase II, which took effect on January 1, 2000, the following changes were made:

- The required VOC reduction was set at 25%. (In July 2001, the EPA granted Chicago and Milwaukee an adjustment to the VOC requirement due to their reliance on ethanol as an oxygenate.)
- The required reduction of toxic pollutants was expanded to 21.5%.
- NOx emissions must be reduced by at least 1.5% (6.8% in gasoline designated as VOC-controlled).

C. ETHANOL INCENTIVE PROGRAMS

1. Federal Tax Incentives

Historically, federal and state incentives have been needed to make ethanol price-competitive in the U.S. fuel market. Currently, there are three federal "tax subsidies" available for the production and use of alcohol transportation fuels. These include: 1) a partial exemption from the federal gasoline excise taxes (the most important incentive for ethanol); 2) an income tax credit for alcohol fuels; and 3) a tax deduction for clean-fueled vehicles that use 85% alcohol (E85) fuels.

a) Partial Exemption from the Federal Excise Tax for Alcohol Fuels

The primary federal incentive is the exemption of 10%-ethanol blends from $0.053 of the $0.184 federal excise tax on each gallon of motor fuel[1]. Because the exemption applies to 10% blends, it amounts to an effective subsidy of $0.53 per gallon of pure ethanol ($0.053 ÷ 10%). Additionally, since January 1993, ethanol-gasoline blends consisting of 7.7% or 5.7% alcohol have received a prorated exemption. These blends, respectively, correspond to the 2.7% and 2.0% oxygen content standards for gasoline sold in OXY and RFG Program areas. The partial exemption from the tax on motor fuels applies only to alcohol derived from renewable resources such as corn, and the alcohol must be at least 190-proof (95% pure alcohol, determined without regard to any added denaturants or impurities). Ethanol and methanol qualify for this exemption without any further processing. Fuels that contain a minimum of 85% alcohol also qualify for the excise tax exemption, as does ethanol derived from other biomass sources (i.e., other

[1] 26 U.S.C. 40.

than grain). The market for these fuels, however, is very small. Even though the exemption for methanol is significantly higher than that of ethanol, very little, if any, methanol is produced from renewable sources, because it is generally not cost competitive against methanol from nonrenewable sources.

b) Federal Income Tax Credits for Alcohol Fuels

There are three categories of income tax credits associated with ethanol: the alcohol blender's tax credit, the straight alcohol fuel credit, and the small ethanol producer's credit. The *alcohol blender's tax credit* is equivalent to the excise tax exemption and is on the same phased-in reduction schedule. Currently, alcohol blenders may receive an income tax credit of 53 cents per gallon of ethanol that they use to produce fuel. The alcohol blender's tax credit is scheduled to expire December 31, 2007. The *straight alcohol credit* applies to qualified mixtures of 85% or more alcohol. It is available only to the user of the fuel in a trade or business, or to the retail seller, as long as the fuel is used for the purpose of motor transportation. The rate for this tax credit is again 53 cents per gallon of ethanol used.

The *small ethanol producer's credit* is 10 cents per gallon of ethanol produced, used, or sold for use as a transportation fuel. This credit is limited to 15 million gallons of annual alcohol production per small producer, defined as having a production capacity of less than 30 million gallons (legislation is pending to raise this limit to 60 million gallons). This credit is strictly a production tax credit available only to the manufacturer that sells alcohol to another entity for blending into a qualified mixture, for use in its own business, or for sale at retail to be used as fuel. All the income tax credits are reduced by any excise tax exemptions claimed on the same fuel. Thus at current levels, the net value of the credit is less than the nominal value, which is a key reason that the excise tax exemption is utilized much more extensively than the income tax credits.

c) Federal Income Tax Deduction for Alternative Fueled Vehicles

The current legislative and administration programs operate under the general umbrella of the 1992 Energy Policy Act. That legislation established a national goal of 30% penetration of U.S. light-duty vehicle fuel markets by alternative fuels, including ethanol, by 2010. It created a new federal tax deduction for individuals or businesses that purchase vehicles burning clean-fuels, including straight-alcohol fuels, and the cost of converting vehicles to operate on such fuels.

2. Federal Bioenergy Program

In August 1999, the Clinton Administration established the goal of tripling current domestic use of bio-based products and bioenergy by 2010. The program has the objectives of reducing emissions and adding $15 - $20 billion to farm income. The Bioenergy Program was created to promote the industrial consumption of selected agricultural commodities in the production of biofuels. The USDA's Commodity Credit Corporation (CCC) provided up to $100 million in 2000 and $150 million in 2001, in incentive payments to encourage increased production of fuel grade ethanol and biodiesel. Under this program, the USDA will make up to $150 million in payments to commercial ethanol and biodiesel producers that increase their bioenergy production between October 1, 2001, and September 30, 2002. Payments will be based on increases in the production of bioenergy from eligible commodities[2] compared to the same time period a year earlier.

3. Federal Biomass Energy Programs

Cellulosic ethanol can be produced from a range of biomass feedstocks, including rice straw, agricultural residues, and dedicated energy crops like switch grass and fast-growing trees. The USDA and DOE conduct research on ethanol processes and biodiesel development. The legislation encourages the evaluation of new energy crops and accelerates the development of advanced biomass technologies to produce a variety of energy-related products and reduce U.S. reliance on fossil fuels.

a) Trade and Development Act of 2000

This law is aimed at expanding two-way trade and creating incentives for the countries of the Caribbean Basin to continue reforming their economies. This legislation removed the rules of origin requirements for ethanol imported into the U.S. from Caribbean Basin Initiative (CBI) countries.

b) Agriculture, Rural Development, Food and Drug Administration and Related Agencies Appropriations Act of 1999

Section 769 of this Act authorizes the Secretary of Agriculture to approve not more than six projects (no more than one in any state) on land subject to Conservation Reserve

[2] Eligible commodities for FY 2002 are barley, corn, grain sorghum, oats, rice, wheat, soybeans, sunflower seed, canola, crambe, rapeseed, safflower, sesame seed, flaxseed, mustard seed, and cellulosic crops (such as switchgrass and short rotation trees) grown on farms in the United States and its territories.

Program (CRP) contracts in which crops may be harvested for biomass used in energy production.

c) Regional Biomass Energy Program

The initiative required the DOE to support regional biomass energy programs and identify a plan for regionally appropriate biomass technologies. The RBEP budget is modest, at about $4 million annually since 1983, but it helps support nearly $12 million in projects annually.

4. Proposed Federal Ethanol Programs

a) DOE Fiscal Year 2002 Biofuels Energy Systems Program

The Department of Energy has requested $81.955 million for its biomass and biopower energy systems budget for FY 2002. The Biofuels Energy Systems program has identified ethanol as the most promising of the liquid transportation fuels options in the near and mid-term.

b) USDA Fiscal Year 2002 New Uses for Agricultural Products

In the proposed USDA budget for fiscal year 2002, the Bush Administration supports investments in new technologies to develop advanced products based on agricultural commodities, for markets in the U.S. and abroad.

5. State Incentives

Some states have a variety of incentives for the production and use of fuel ethanol, ranging from excise tax exemptions to producer payments. Incentives for states in the region are detailed in Table 1.

Table 1: Ethanol Incentives by State

	Ethanol Incentive
Alaska	4 ¢/gal – winter blends only
Connecticut	1 ¢/gal - excise exemption
Hawaii	4% - sales tax exemption
Idaho	2.1 ¢/gal - excise exemption
Illinois	2% - sales tax exemption
Iowa	1 ¢/gal - excise exemption
Minnesota	20 ¢/gal - producer payment
Missouri	20 ¢/gal - producer payment
Montana	30 ¢/gal - producer payment
Nebraska	20 ¢/gal - producer payment
Ohio	1 ¢/g - restrictions apply
South Dakota	20 ¢/gal - producer payment
Wyoming	40 ¢/gal - producer payment

Source: Oxy-fuel News, April 25, 2002

D. ONGOING POLICY ISSUES

1. Reformulated Gasoline and MTBE

MTBE has been the primary oxygenate used in the RFG Program. However, MTBE also has contaminated groundwater in a number of locations around the country. Accordingly, MTBE is being viewed by some policymakers as causing a tradeoff between the goals of clean air and clean water. The EPA does not regulate the levels of MTBE in drinking water; however, large public water utilities are required to monitor for

the compound, and some states have set individual standards for acceptable MTBE levels in public drinking water.

The slow pace that science has taken to prove the adverse affects of MTBE has slowed the debate over legislation banning the use of the additive nationally. Two legislative bills are now pending which would eliminate MTBE as a fuel additive. It is likely that one of these pending bills will be passed by the end of the 107th Congress, putting the timetable on an all-out federal ban on MTBE in the United States between three and four years. The result of the lack of clear federal action has been a stream of announcements by state governments that they would phase out and/or ban the use of MTBE, as well as proposals by Congress and the EPA to update the CAA90, the Clean Water Act, and associated regulations.

2. Phase 2 Reformulated Gasoline

As part of the Phase 2 requirements of the RFG Program, which took effect in 2000, gasoline sold in the summer months (beginning June 1,2000) must meet tighter volatility standards. Because of its physical properties, ethanol has a higher RVP than MTBE. Thus, Phase 2 RFG-compliant fuels using ethanol require base gasoline with a lower RVP, referred to as Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB), which is more expensive to produce. To reduce the cost of ethanol-blended RFG and decrease the potential for price spikes, the EPA issued a rulemaking in June 2001 adjusting the VOC standards for RFG in Chicago and Milwaukee, the only areas of the country that use ethanol exclusively in RFG. This VOC adjustment is equivalent to a slightly higher RVP allowance.

New legislative options beyond Phase 2 have included eliminating the oxygenate standard for RFG, or suspending the program entirely. However, some in the petroleum industry suggest that additional changes to fuel requirements could further disrupt gasoline supplies. Four current bills would allow a higher RVP for ethanol-blended fuels. These are H.R. 454 (Johnson, T.), H.R. 1999 (Nussle), S. 670 (Daschle), and S. 892 (Harkin).

3. Ethanol Tax Incentives

The incentives that allow fuel ethanol to compete with other additives continue to be controversial. Nevertheless, Congress in 1998 extended the motor fuels tax exemption through 2007, but at declining rates.

In the current Congress, S. 907 (Carnahan) would extend the alcohol fuels tax exemption through 2015. In addition, several bills would expand the availability of the small producer credit, increase the size of a covered producer, and make the credit available to cooperatives. These include H.R. 1636 (Thune), H.R. 1999 (Nussle), S. 312 (Grassley), S. 613 (Fitzgerald), and S. 907 (Carnahan).

H.R. 2303 (Lewis, Ron) contains the above provisions on small producers and cooperatives. In addition, the bill would provide tax credits for the retail sale of ethanol and for the installation of retail infrastructure.

4. Renewable Fuels Standard

A renewable fuels standard (RFS) would require that the nation's fuel supply contain a certain percentage of renewable fuels. The definition of a renewable fuel would include biodiesel, ethanol, or any other liquid fuel produced from biomass or biogas that is used to reduce the quantity of fossil fuel present in a fuel mixture. The RFS would be measured in gasoline-equivalent gallons and would cover both gasoline and diesel fuel.

Under the Hagel/Johnson legislation the renewable fuels standard that is being purposed In this bill currently is very aggressive. Under this bill, the renewable fuels standard would start off at a low .80% of total U.S. gasoline consumption in 2002 and rise every year until it reaches a level of 5% by 2016. In the Daschle / Lugar Bill, the renewable fuels requirement starts at 0.60% in 2002 and increases up to a maximum rate of 1.5% in 2011.

E. FARM POLICY CONSIDERATIONS

United States policy provides support to the agriculture sector in a wide variety of ways, including direct payments to support producer incomes, beneficial loan programs, investment in infrastructure, and support for soil conservation and water quality. The bulk of government program support for agriculture goes for a few crops. For example, USDA outlays for direct commodity support in FY 2000 amounted to $16.1 billion, of which corn accounted for $5.77 billion. Corn, cotton, rice, soybeans and wheat together accounted for $14.4 billion, just under 90% of the total. The future direction and size of federal agriculture programs are extremely uncertain as of the writing of this report.

IV. U.S. Ethanol Production

A. BACKGROUND

As was depicted in the chart contained in the introduction to this report (Figure 1), the production of ethanol in the United States has expanded greatly since the late 1970s. Ethanol production stood at 175 million gallons in 1980, grew to 900 million gallons by 1990, and reached a record 1.766 billion gallons in 2001. Thus, ethanol production has expanded at a rate of 725-730 million gallons per decade over each of the last two decades, equivalent to a compounded annual growth rate of 11.2%. Excluding the rebound in 1997 from the plant shutdowns that were induced by high corn prices and tight availability in 1996, the highest year-over-year increases in ethanol production have been approximately 150-160 million gallons. (Current ethanol production for the year 2002 is forecast at about 2.3 billion gallons, an increase of over 500 million gallons from the prior year).

B. CURRENT INDUSTRY STRUCTURE

The ethanol industry is geographically concentrated in the Corn Belt (see Figure 2). Specifically, most plants – and a large majority of capacity – are located in a triangle that stretches from south central Nebraska to central Minnesota over to eastern Illinois. Significant plant additions in Nebraska and Minnesota have occurred during the last 10-15 years due to corn supplies and state incentives.

Figure 3, highlights the important concentration and correlation between major regions of corn production and the draw to ethanol manufacturing facilities. Ownership of the ethanol facilities and their location in the Great Plains region is displayed in Figure 4.

The current capacity of the U.S. ethanol industry (as of April 2002), is estimated to be 2.347 billion gallons, see Table 1. Archer Daniels Midland (ADM) remains the largest ethanol producer, able to produce 950 million gallons per year (mgy), or 40% of total U.S. capacity. ADM's share of U.S. capacity has decreased moderately over the last decade, as both large corporations and farmer-owned cooperatives have entered the industry at a pace faster than ADM's expansion. ADM has chosen to grow predominantly through the expansion of its existing mammoth facilities rather than through the construction of new ones, due to (1) ADM's reliance on wet mills, (2) the economies of scale possible for wet mills, and (3) the lower cost per gallon of expanding a facility versus constructing a new one. ADM is roughly seven times as large as the

next-largest companies in the industry (Cargill, Minnesota Corn Processors and Williams Bio-Energy), each of which has 100 -112 mgy of capacity.

Figure 2: Ethanol Plants by Capacity, November 2001

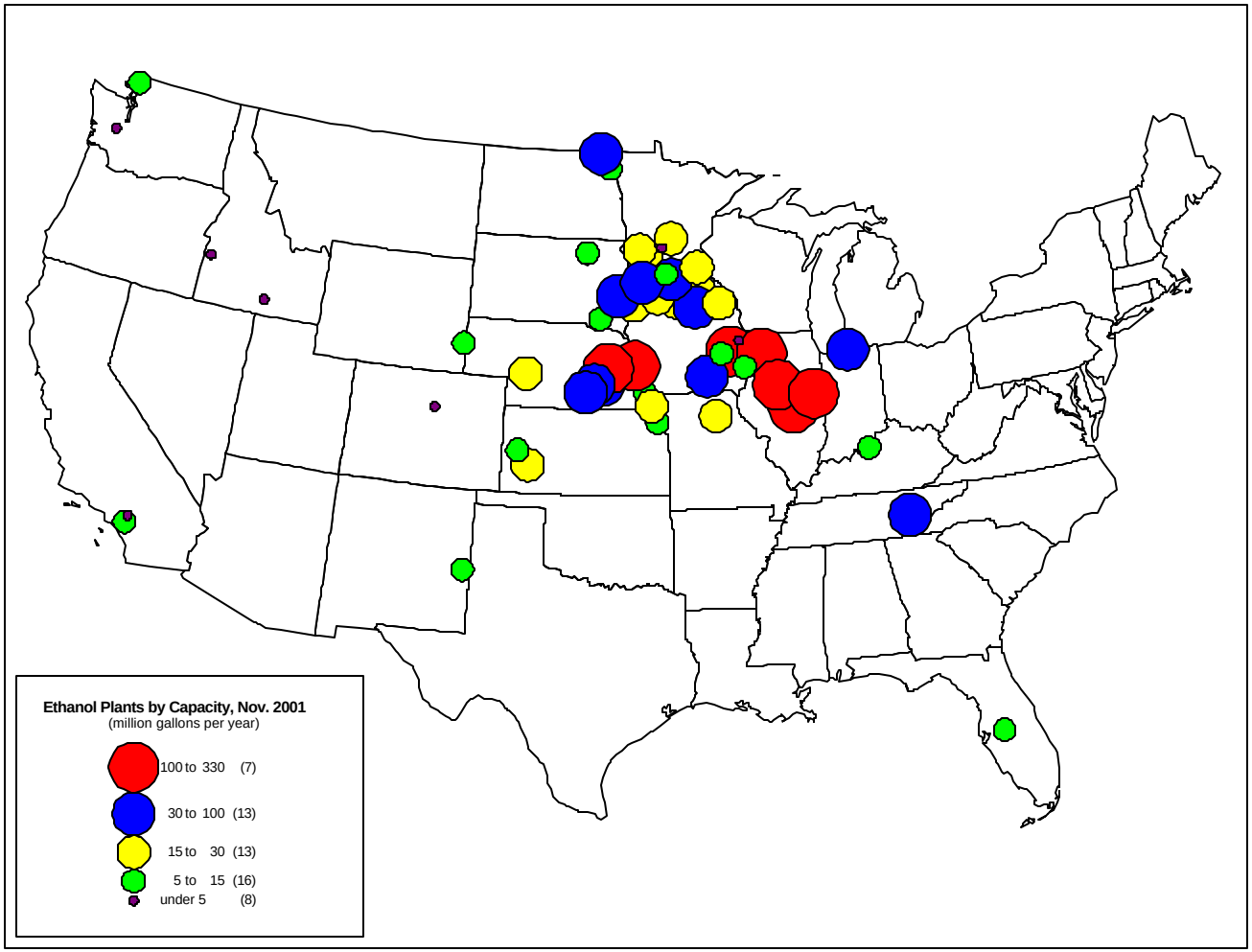


Figure 3: Relationship of Ethanol Processing Facilities to Major Corn Producing Regions

Note: All Types of Processing Facilities (e.g., Whey, Wood Pulp) Are Included on the Map

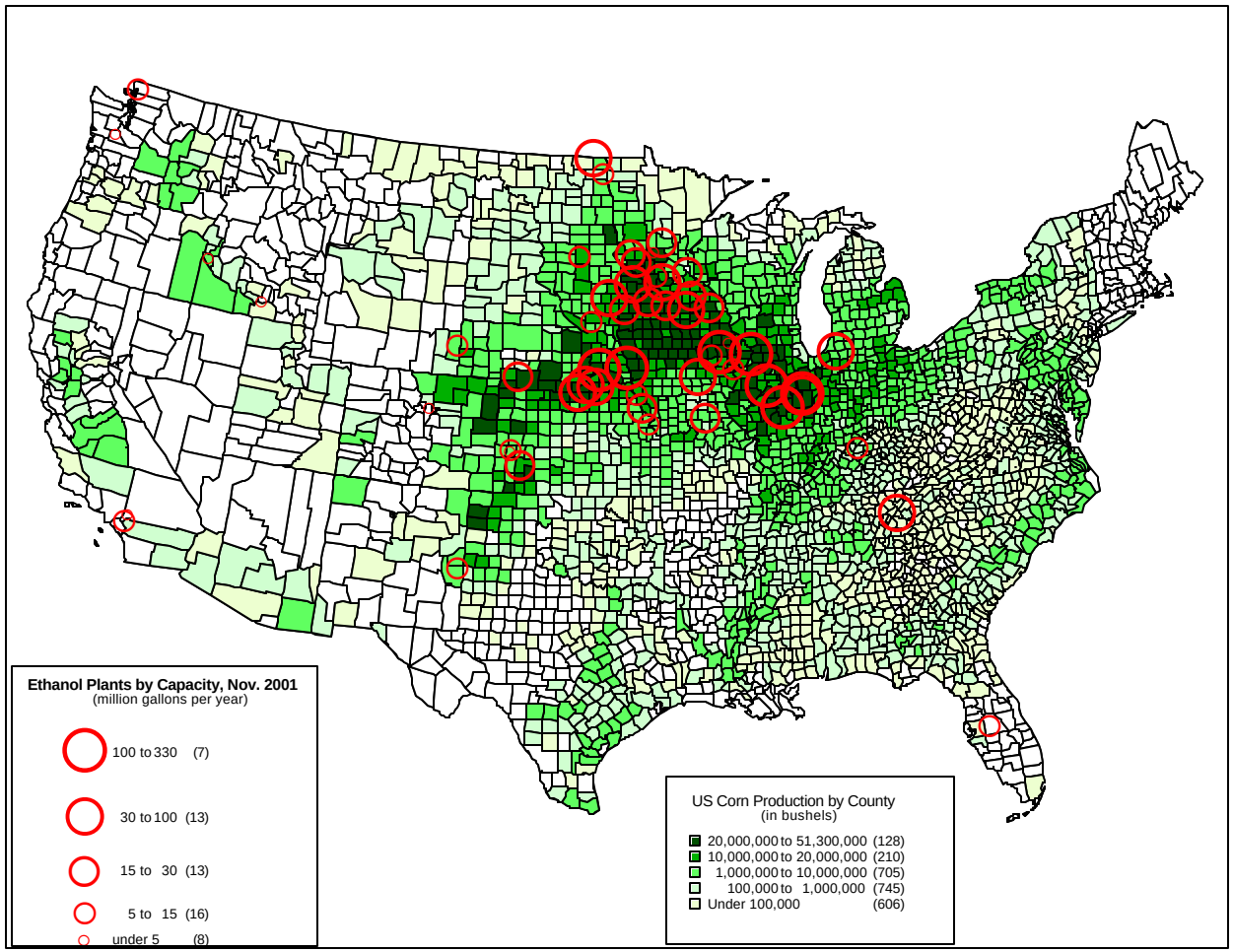


Figure 4: Great Plains Region, Operational Ethanol Facilities

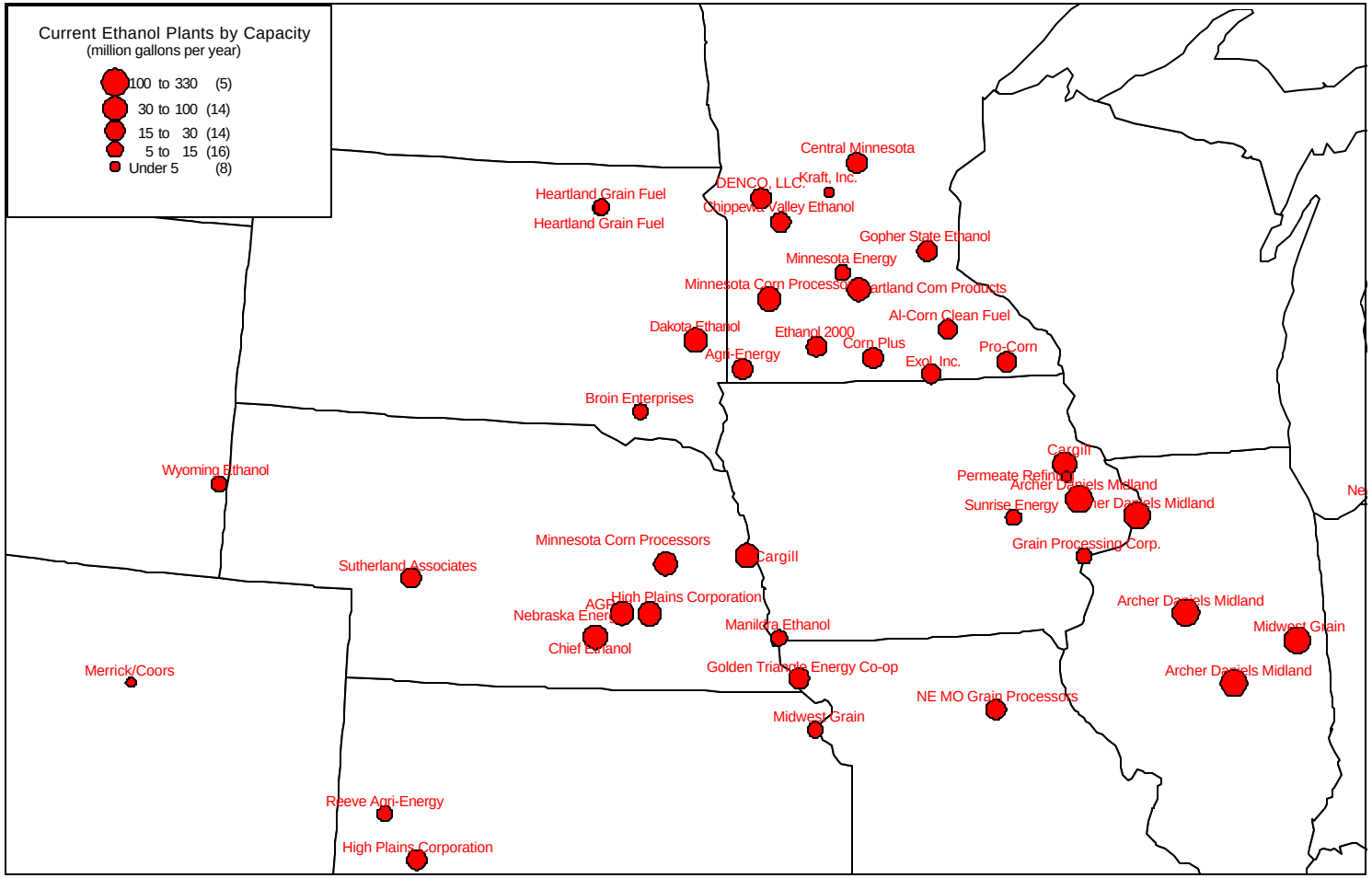


Table 2: Operational Ethanol Facilities (April 2002)

COMPANY	LOCATION	FEEDSTOCK	mmgy
A.E. Staley	Loudon, TN	Corn	60
AGP*	Hastings, NE	Corn	52
Agra Resources Coop (Exol)*	Albert Lea, MN	Corn	37
Agri-Energy, LLC*	Luverne, MN	Corn	21
Alchem Ltd. LLLP	Grafton, ND	Corn	10.5
Al-Corn Clean Fuel*	Claremont, MN	Corn	18
Archer Daniels Midland	Decatur, IL	Corn	950
	Peoria, IL	Corn	
	Cedar Rapids, IA	Corn	
	Clinton, IA	Corn	
	Wallhalla, ND	Corn/barley	
Broin Companies	Scotland, SD	Corn	9
Cargill, Inc.	Blair, NE	Corn	75
	Eddyville, IA	Corn	35
Central MN Ethanol Coop*	Little Falls, MN	Corn	19
Chief Ethanol	Hastings, NE	Corn	62
Chippewa Valley Ethanol Co.*	Benson, MN	Corn	21
Corn Plus*	Winnebago, MN	Corn	44
Dakota Ethanol, LLC*	Wentworth, SD	Corn	45
DENCO, LLC*	Morris, MN	Corn	20
ESE Alcohol Inc.	Leoti, KS	Seed corn	1.5
Ethanol2000, LLP*	Bingham Lake, MN	Corn	30
Golden Cheese Company of California*	Corona, CA	Cheese whey	5
Golden Triangle Energy, LLC*	Craig, MO	Corn	20
Gopher State Ethanol	St. Paul, MN	Corn	15
Grain Processing Corp.	Muscatine, IA	Corn	10
Heartland Corn Products*	Winthrop, MN	Corn	35
Heartland Grain Fuels, LP*	Aberdeen, SD	Corn	8
	Huron, SD	Corn	14
High Plains Corp.	York, NE	Corn/milo	50
	Colwich, KS		20
	Portales, NM		15
J.R. Simplot	Caldwell, ID	Potato waste	6
	Burley, ID		
Land O' Lakes*	Melrose, MN	Cheese whey	2.6
Manildra Energy Corp.	Hamburg, IA	Corn/milo/wheat starch	8
Merrick/Coors	Golden, CO	Waste beer	1.5
Midwest Grain	Pekin, IL	Corn/wheat starch	78
	Atchison, KS		
Miller Brewing Co.	Olympia, WA	Brewery waste	0.7
Minnesota Corn Processors*	Columbus, NE	Corn	100
	Marshall, MN	Corn	40
Minnesota Energy*	Buffalo Lake, MN	Corn	18
New Energy Corp.	South Bend, IN	Corn	85
Northeast MO Grain Processors*	Macon, MO	Corn	21
Permeate Refining	Hopkinton, IA	Sugars & Starches	1.5
Plover Ethanol	Plover, WI	Seed corn	4
Pro-Corn, LLC*	Preston, MN	Corn	22
Quad-County Corn Processors*	Galva, IA	Corn	18
Reeve Agri-Energy	Garden City, KS	Corn/milo	12
Siouxland Energy & Livestock Coop*	Sioux Center, IA	Corn	14
Sunrise Energy*	Blairstown, IA	Corn	7
Sutherland Associates	Sutherland, NE	Corn	15
Tri-State Ethanol Co., LLC*	Rosholt, SD	Corn	14
U.S. Energy Partners, LLC	Russell, KS	Milo	25
U.S. Liquids	Louisville, KY	Beverage waste	4
	Bartow, FL		4
	R. Cucamonga, CA		4
Williams Bio-Energy	Pekin, IL	Corn	100
	Aurora, NE	Corn	35
Wyoming Ethanol	Torrington, WY	Corn	5
Total			2,347

* farmer-owned

Sources: BBI Int'l, Renewable Fuels Assn., Milling & Baking News, Industry Sources

C. FUTURE CAPACITY

According to the Renewable Fuels Association, seventeen ethanol plants are currently under construction. Almost all are new entrants to the industry are owned by farmer organizations and all are located in or near the existing industry, which is concentrated in the corn belt. (see Figure 5).

Figure 5: Anticipated New Construction: Ethanol Plants by Capacity

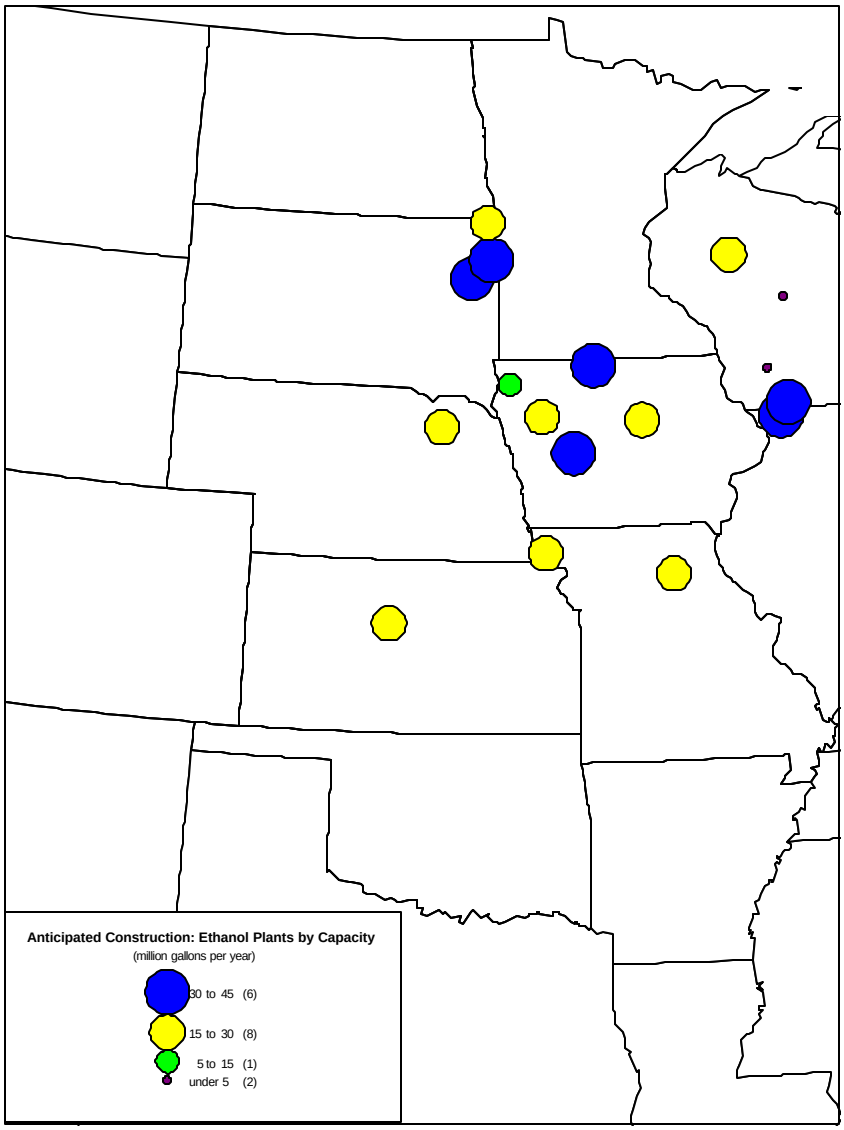


Table 3, shows the forecast for U. S. ethanol production capacity through 2005 with projections for both expansions of capacity by existing companies and new entrants to the industry. The California Energy Commission did the survey work to come up with

this forecast. The bulk of the expected growth (70%) is expected to come from new entrants as the number of plants is forecast to increase by 46 plants during the period. Current low corn prices and moderate oil prices have supported the expansion of capacity, as has anticipation that California will consume significant quantities of ethanol within the next couple of years.

Table 3: Planned Growth of Industry Production Capacity
(Cumulative by End of Year)

		2001	2002	2003	2004	2005
Existing Industry	Companies	44	44	44	44	44
	Plants	57	58	58	58	58
	Capacity (mgy)	2,219	2,481	2,689	2,774	2,852
New Entrants	Companies	4	21	40	40	40
	Plants	4	21	43	44	46
	Capacity (mgy)	82	518	1,329	1,387	1,575
Existing & New Plants	Companies	48	65	84	84	84
	Plants	61	79	101	102	104
	Capacity (mgy)	2,301	2,999	4,018	4,161	4,427

Source: California Energy Commission

The forecast provided in Table 3, reflects the entry of 40 new companies into the ethanol industry, in addition to the 44 currently operating. If realized, the industry would double in terms of both the number of participants and their aggregate capacity. However, the Commission issued the caveat: "While survey respondents were asked to provide data on fuel-grade ethanol production capacity only, some amount (presumably not substantial) of ethanol production for the industrial or beverage markets may have been included in the tabulated survey results." It is also unknown whether respondents included the portion of the grind that would normally be dedicated to production of corn sweeteners at facilities with so-called swing capacity (i.e., that typically produce high fructose corn syrup during warmer months and ethanol during cooler months).

V. GREAT PLAINS ETHANOL SITUATION AND OUTLOOK

With the current and planned buildup in production capacity and a significant location advantage, the Great Plains region stands to enjoy strong economic gains due to the expansion of the ethanol industry in the region. The move is particularly timely as it comes amidst the legislative push to eliminate fuel additives that are sought unsafe in many additional areas of the U.S.

Table 4, denotes the company, city and state where ethanol plants are under construction and their potential capacity. The bulk of the new plants intend to utilize corn as the feedstock. The list of proposed plants changes frequently as construction is completed. Currently the Renewable Fuels Association lists 8 plants that are on the books for Iowa, South Dakota and Nebraska. When these plants are completed, a total capacity increase of 255 million gallons annually would be anticipated.

Table 4: Ethanol Plants Under Construction

Company Name	City	State	Feedstock	Capacity
Glacial Lakes Energy, LLC	Watertown	SD	Corn	40
Husker Ag Processing	Plainview	NE	Corn	20
Little Sioux Corn Processors, LLC	Marcus	IA	Corn	40
Midwest Grain Processors	Lakota	IA	Corn	45
Northeast Iowa Ethanol, LLC	Earlville	IA	Corn	15
Northern Lights Ethanol, LLC	Milbank	SD	Corn	40
Pine Lake Corn Processors, LLC	Steamboat Rock	IA	Corn	15
Tall Corn Ethanol, LLC	Coon Rapids	IA	Corn	40
Total				255

Sources: BBI International, Renewable Fuels Assn.

Figure 6, depicts the volume of corn production and planned ethanol plants by capacity of production. The darker shaded areas reveal counties where corn production is concentrated. Red circles show ethanol plants that were operational as of January 2002 while yellow circles identify those plants intended to come into production over the next two to three years. Production capacity in the region will continue to expand quickly with the addition of new ethanol plants and with the more then adequate volumes of corn production produced in the region.

Figure 6: Great Plains Region: Current and Anticipated Ethanol Production and Density of Corn Production

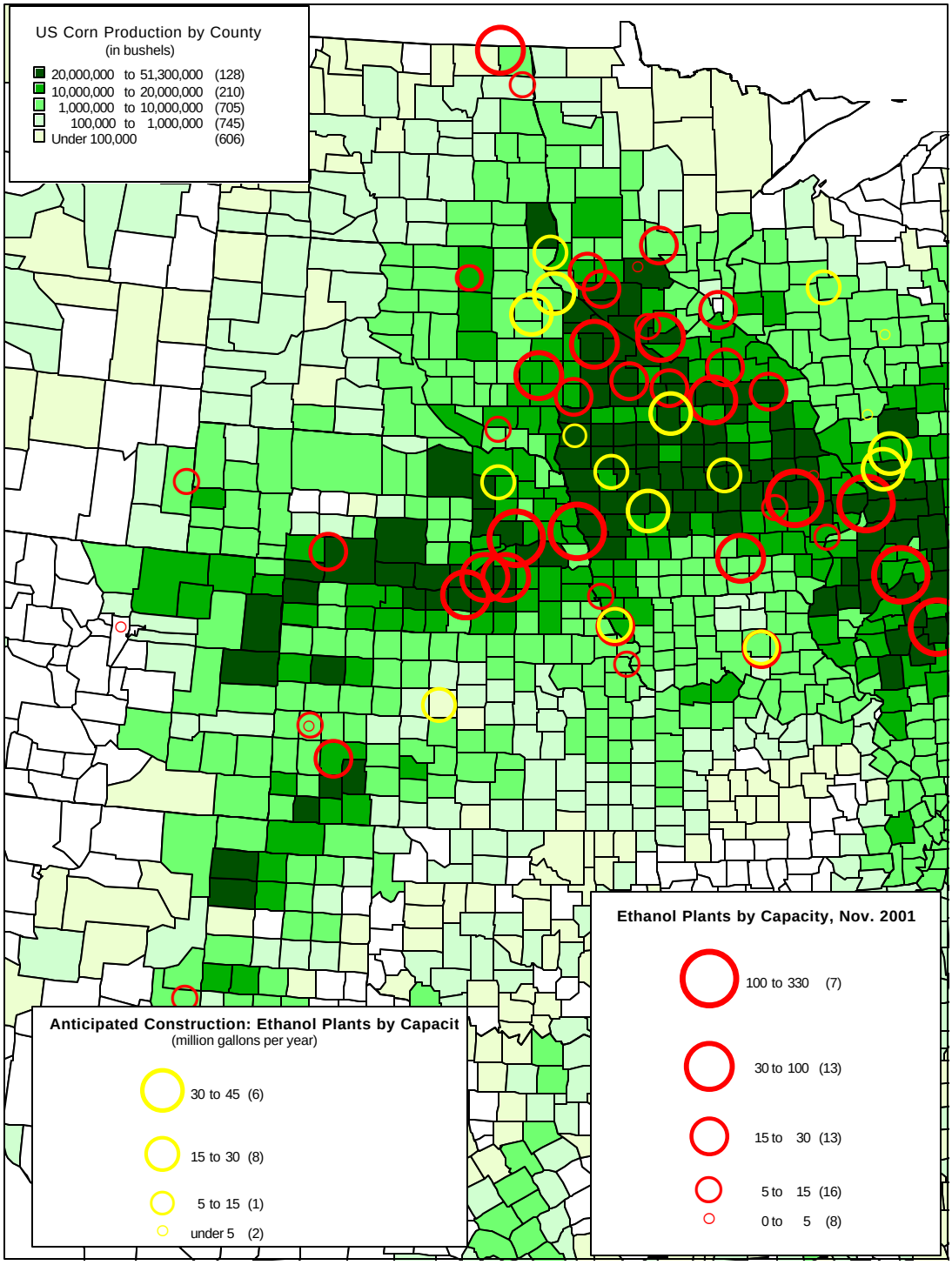


Table 5, shows existing and future capacity specifically in the Great Plains region and the surrounding Corn Belt states. As one might anticipate with corn as the major feedstock, those states with large corn production are leaders in ethanol production and planned expansion. Iowa has the most significant expansion plans with respect to volume with South Dakota a distant second. Kansas and Nebraska each intend to expand capacity by significant percentages, but the level of volume is still small relative to Iowa. It is interesting to note that no expansion in existing capacity is planned in several other states in the region with large corn production, such as Nebraska and Minnesota.

Table 5: Anticipated Increase in Ethanol Processing Capacity in the Great Plains, million gallons per year (mmgy)

Region	Existing Capacity mmgy	Capacity Under Construction mmgy	% Change in Capacity	Future Capacity mmgy
Colorado	1.5	0.0	0.0%	1.5
Iowa	422.5	132.0	31.2%	554.5
Kansas	41.5	25.0	60.2%	66.5
Oklahoma	0.0	0.0	0.0%	0.0
Minnesota	291.6	0.0	0.0%	291.6
Missouri	30.0	0.0	0.0%	30.0
North Dakota	40.5	0.0	0.0%	40.5
Nebraska	453.0	20.0	4.4%	473.0
South Dakota	69.0	95.0	137.7%	164.0
Great Plains	1,349.6	177.0	13.1%	1,526.6
Rest of the Country	800.7	99.7	12.5%	900.4
US	2,150.3	276.7	12.9%	2,427.0

APPENDIX: Historical Overview of Great Plains Corn Basis

Table 6: Select Kansas Locations, Monthly Average, Corn Flat Price, Dollars per Cwt. Bushels

Chanute, KS	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96						366	390	434	493	465	533	432
1996/97	353	282	277	282	280	278	282	280	274	259	247	241
1997/98	236	239	249	242	251	249	242	233	228	231	217	187
1998/99	157	180	199	197	201	201	196	194	192	194	170	184
1999/00	168	169	174	168	193	203	208	214	214	191	162	150
2000/01	147	179	197	200	205	203	199	194	177	176	181	185
2001/02	173	176	180	182	190	187	184	190				

Pittsburg, KS	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96						367	387	442	489	465	534	433
1996/97	357	286	279	282	272	279	288	288	278	264	251	244
1997/98	234	247	248	244	253	253	245	235	230	232	214	186
1998/99	160	180	199	195	199	201	198	194	191	193	170	182
1999/00	165	171	173	167	194	199	203	208	209	187	156	147
2000/01	145	176	197	199	202	198	199	193	180	181	183	185
2001/02	175	174	181	184	191	190	185	185				

Wellington, KS	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96												
1996/97	312	242	230	237	236	248	272	267	257	246	241	227
1997/98	235	249	246	241	246	246	243	230	215	222	215	192
1998/99	167	179	184	183	192	192	190	183	183	185	164	182
1999/00	165	159	160	152	176	183	192	194	191	167	137	155
2000/01	154	172	184	184	194	195	191	186	173	173	184	195
2001/02	189	188	189	190	196	192	190	187				

Table 7: Corn, CBOT Price, Dollars per Cwt. Bushels

Chicago Board of Trade	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96	299	323	328	345	362	374	394	454	495	469	461	364
1996/97	342	284	268	267	268	281	305	299	284	266	255	263
1997/98	264	281	276	266	271	269	266	249	243	242	230	206
1998/99	203	219	219	216	217	215	220	218	218	217	192	214
1999/00	206	201	196	194	216	220	227	227	236	208	182	178
2000/01	188	204	211	217	219	211	211	206	196	193	212	217
2001/02	217	208	205	210	210	205	204	199	197			

Table 8: Select Kansas Locations, Monthly Average Corn Basis, Dollars per Cwt. Bushels

CHANUTE, KS	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96						-9	-4	-20	-2	-3	72	67
1996/97	11	-2	9	15	12	-3	-23	-19	-9	-7	-8	-22
1997/98	-28	-42	-27	-24	-20	-20	-24	-16	-15	-11	-14	-20
1998/99	-47	-39	-20	-19	-16	-14	-24	-24	-26	-23	-22	-30
1999/00	-39	-32	-22	-26	-23	-17	-20	-14	-22	-17	-20	-29
2000/01	-41	-25	-14	-18	-14	-9	-12	-12	-19	-16	-31	-32
2001/02	-43	-32	-25	-28	-20	-18	-19	-9				

PITTSBURG, KS	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96						-7	-7	-13	-6	-4	73	68
1996/97	15	2	11	16	4	-2	-17	-11	-5	-2	-4	-19
1997/98	-31	-34	-28	-22	-18	-16	-21	-14	-13	-11	-16	-20
1998/99	-44	-39	-20	-21	-18	-13	-22	-24	-27	-24	-22	-32
1999/00	-42	-30	-22	-27	-22	-21	-24	-20	-27	-21	-26	-31
2000/01	-43	-28	-13	-18	-17	-14	-13	-13	-16	-11	-30	-32
2001/02	-42	-34	-24	-25	-19	-15	-19	-14				

WELLINGTON, KS	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1995/96												
1996/97	-30	-42	-38	-30	-32	-32	-33	-33	-27	-20	-14	-36
1997/98	-30	-32	-30	-25	-25	-22	-24	-19	-28	-20	-15	-14
1998/99	-36	-39	-35	-32	-25	-23	-29	-35	-35	-32	-28	-32
1999/00	-42	-42	-35	-42	-40	-36	-35	-33	-45	-41	-45	-23
2000/01	-34	-32	-26	-34	-25	-16	-20	-19	-23	-20	-29	-22
2001/02	-28	-20	-15	-19	-14	-12	-14	-12				

Figure 7: Comparison of Nearby Corn Futures to Flat Prices in Chanute, Pittsburg & Wellington, Kansas

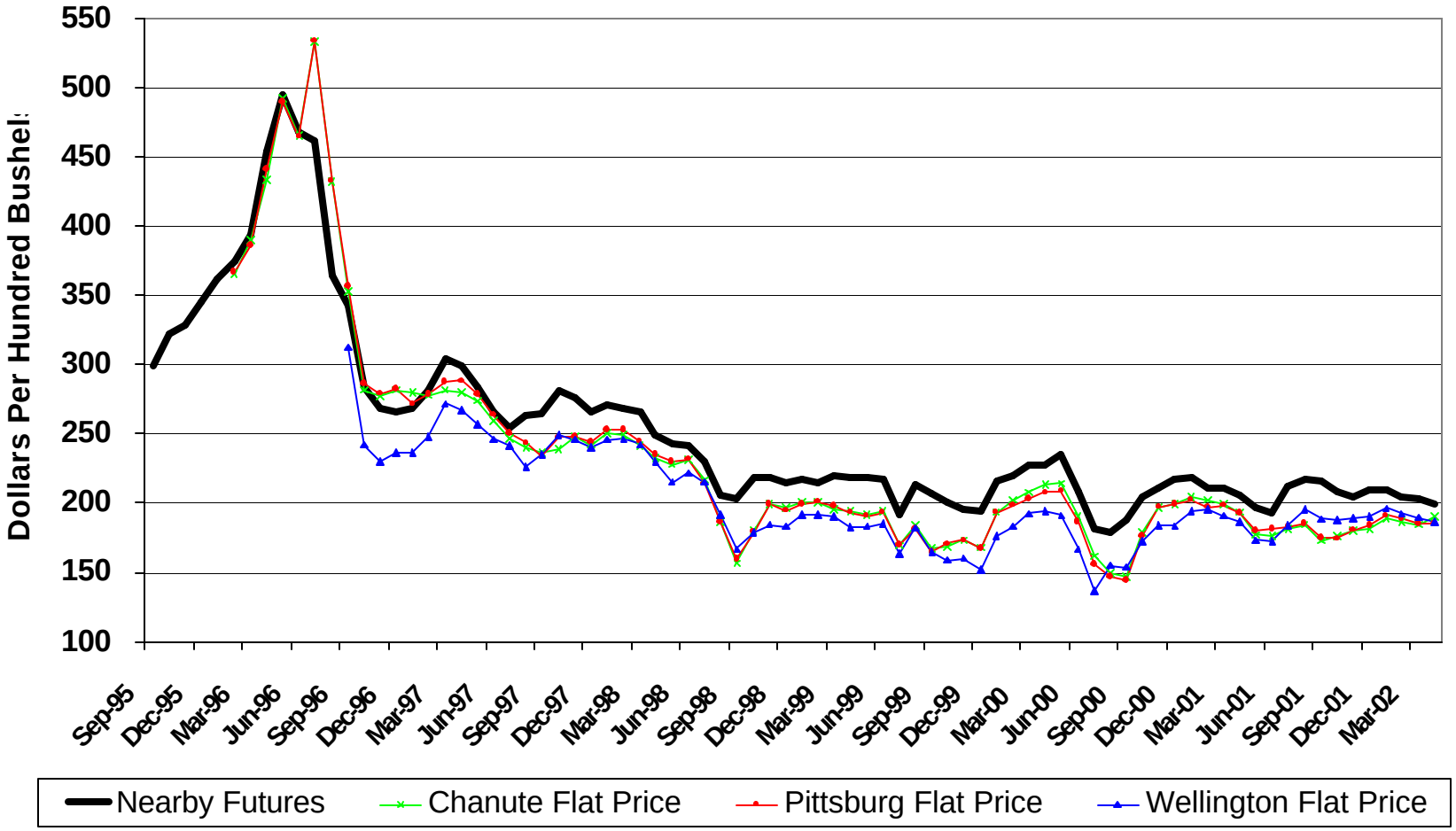


Figure 8: CBOT Nearby Corn Futures, Trend

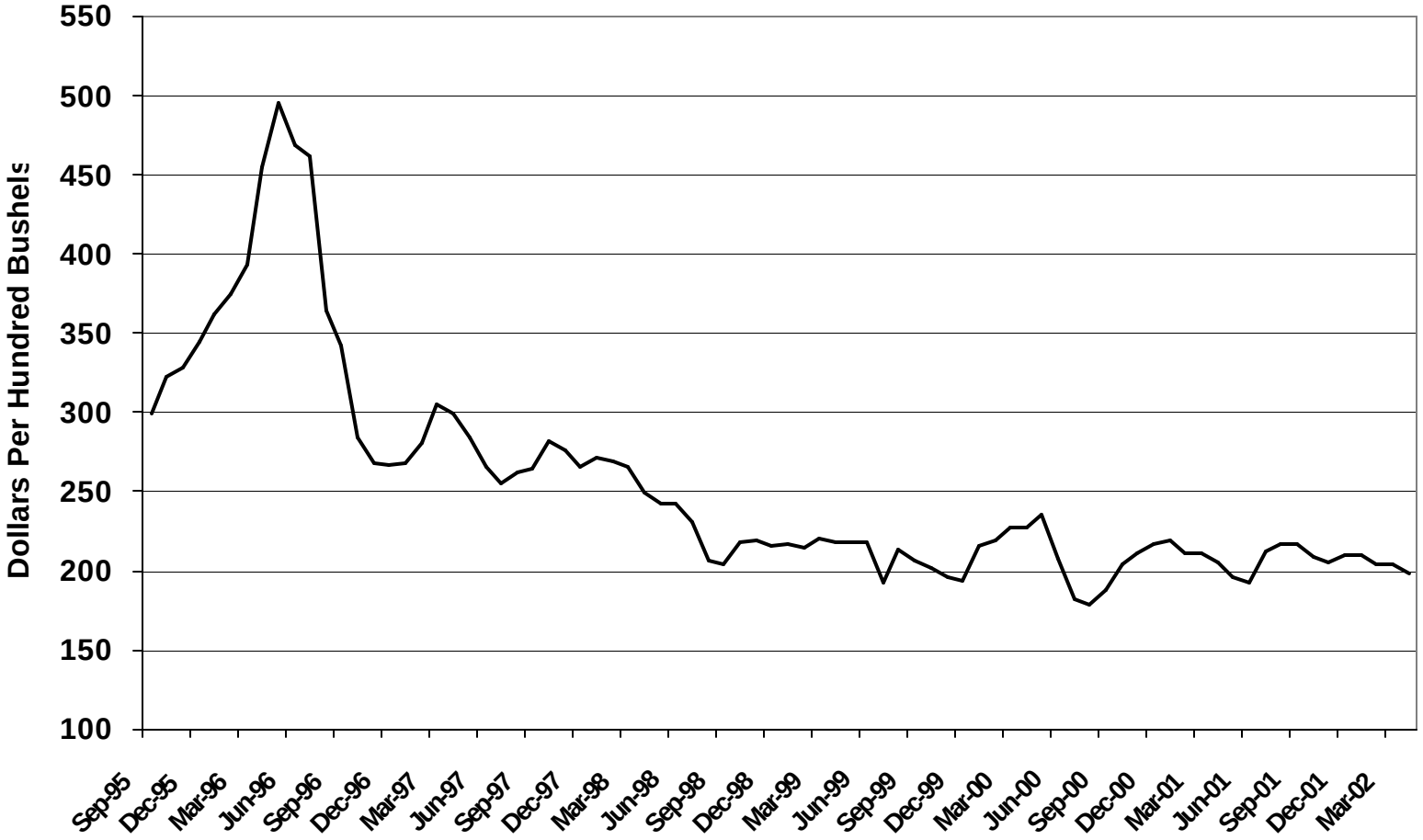


Figure 9: CBOT Nearby Corn Futures, Seasonal Patterns

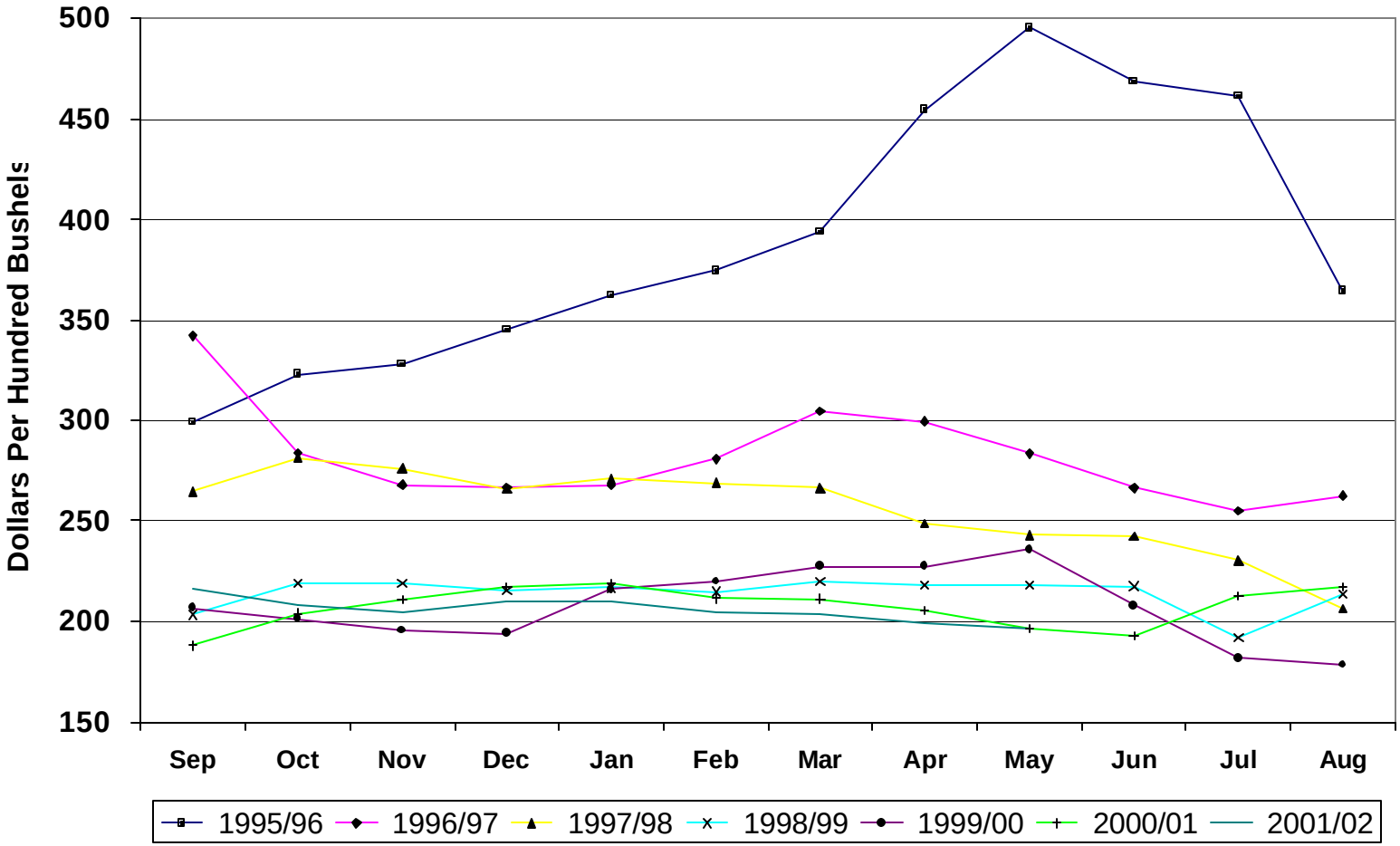


Figure 10: Corn Flat Price Trend, Chanute, Kansas

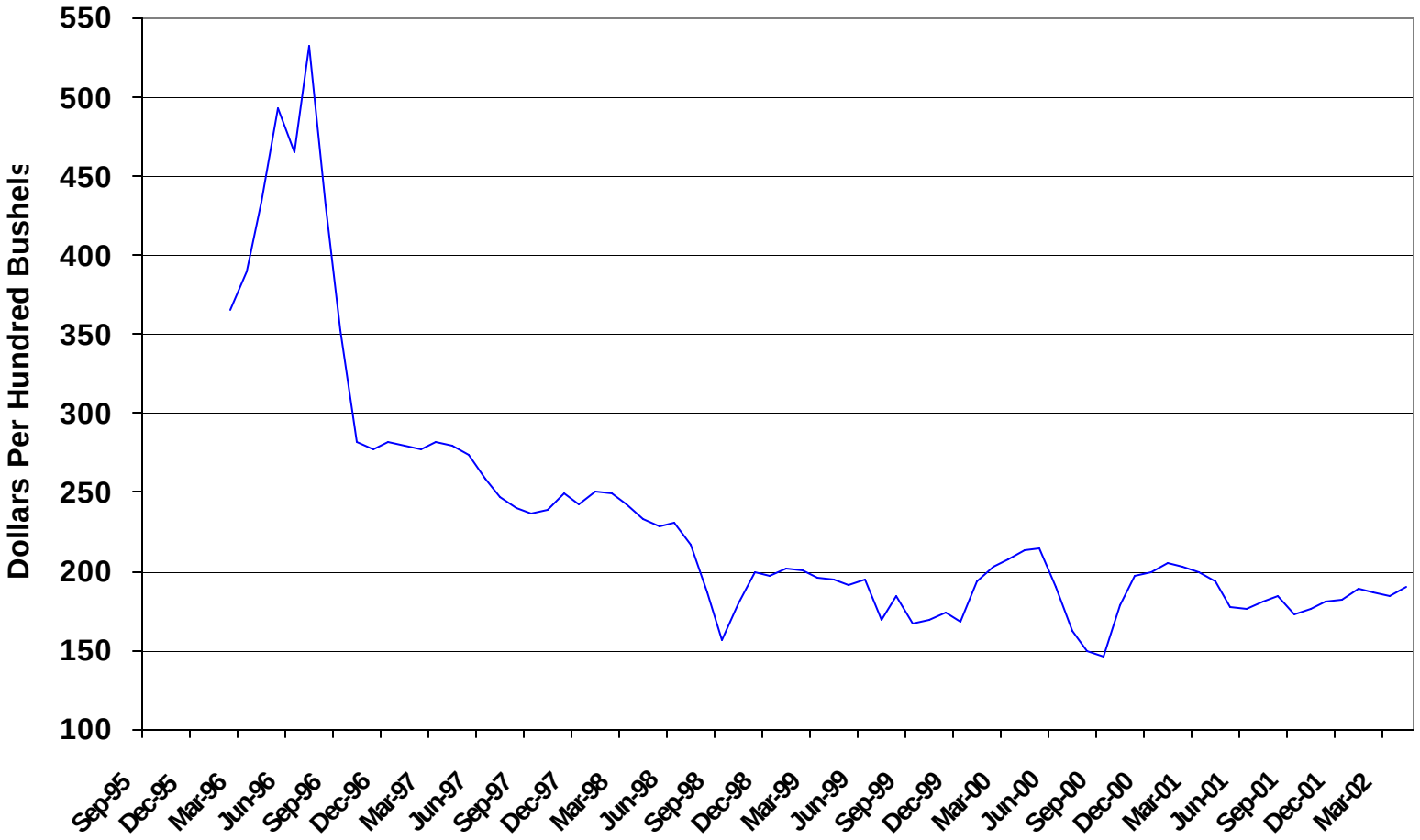


Figure 11: Corn Flat Price Seasonal Patterns, Chanute, Kansas

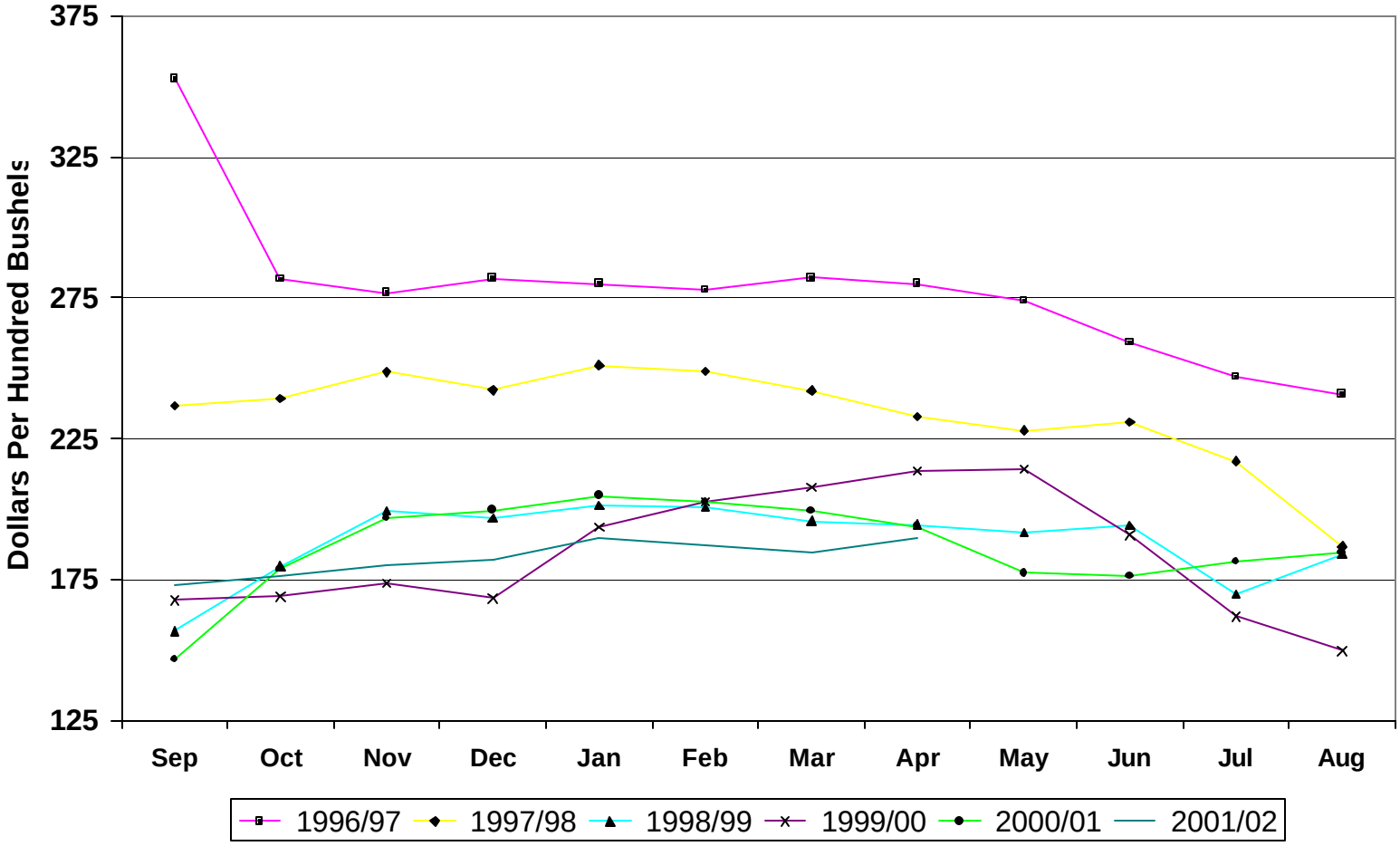


Figure 12: Corn Flat Price Trend, Pittsburg, Kansas

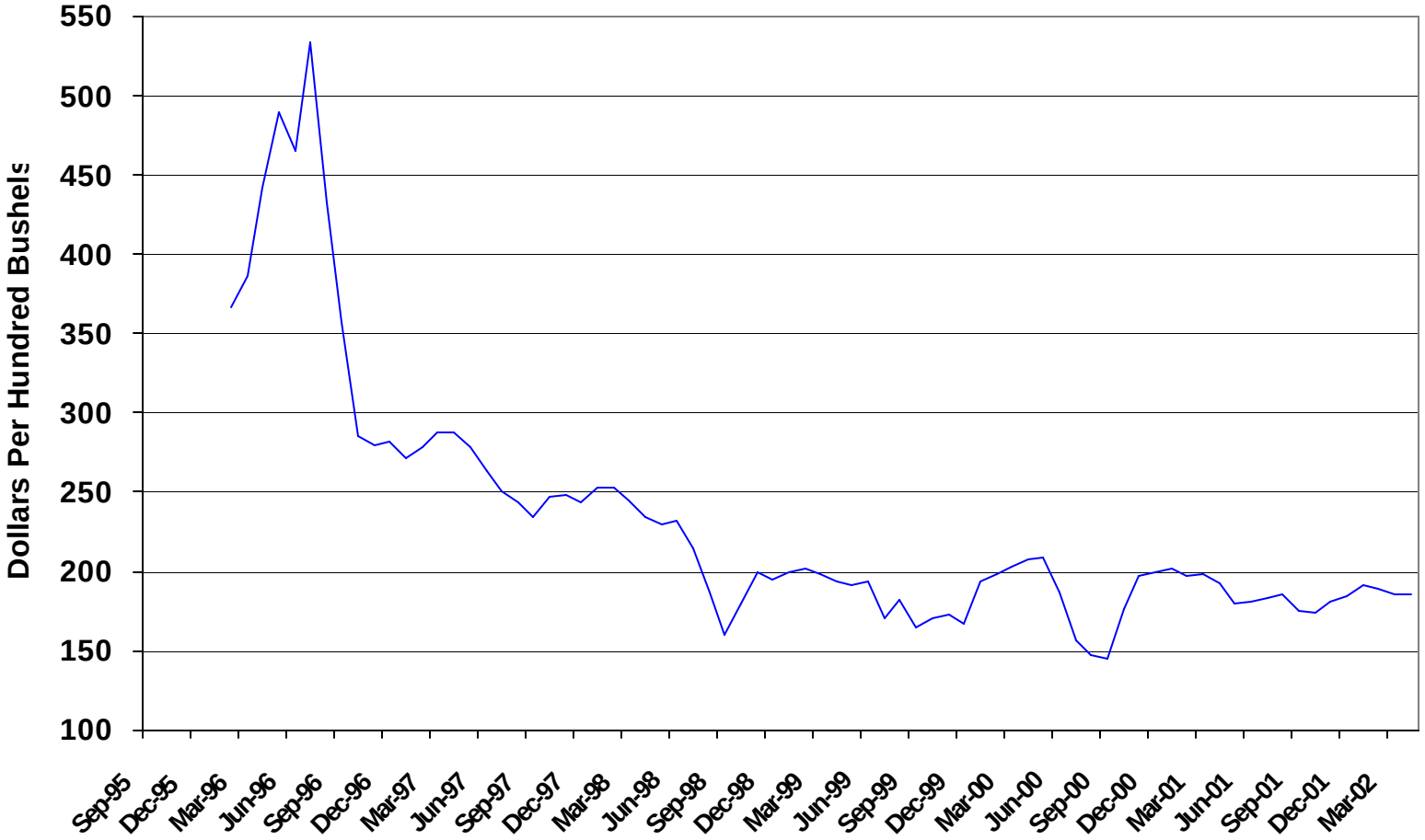


Figure 13: Corn Flat Price Seasonal Patterns, Pittsburg, Kansas

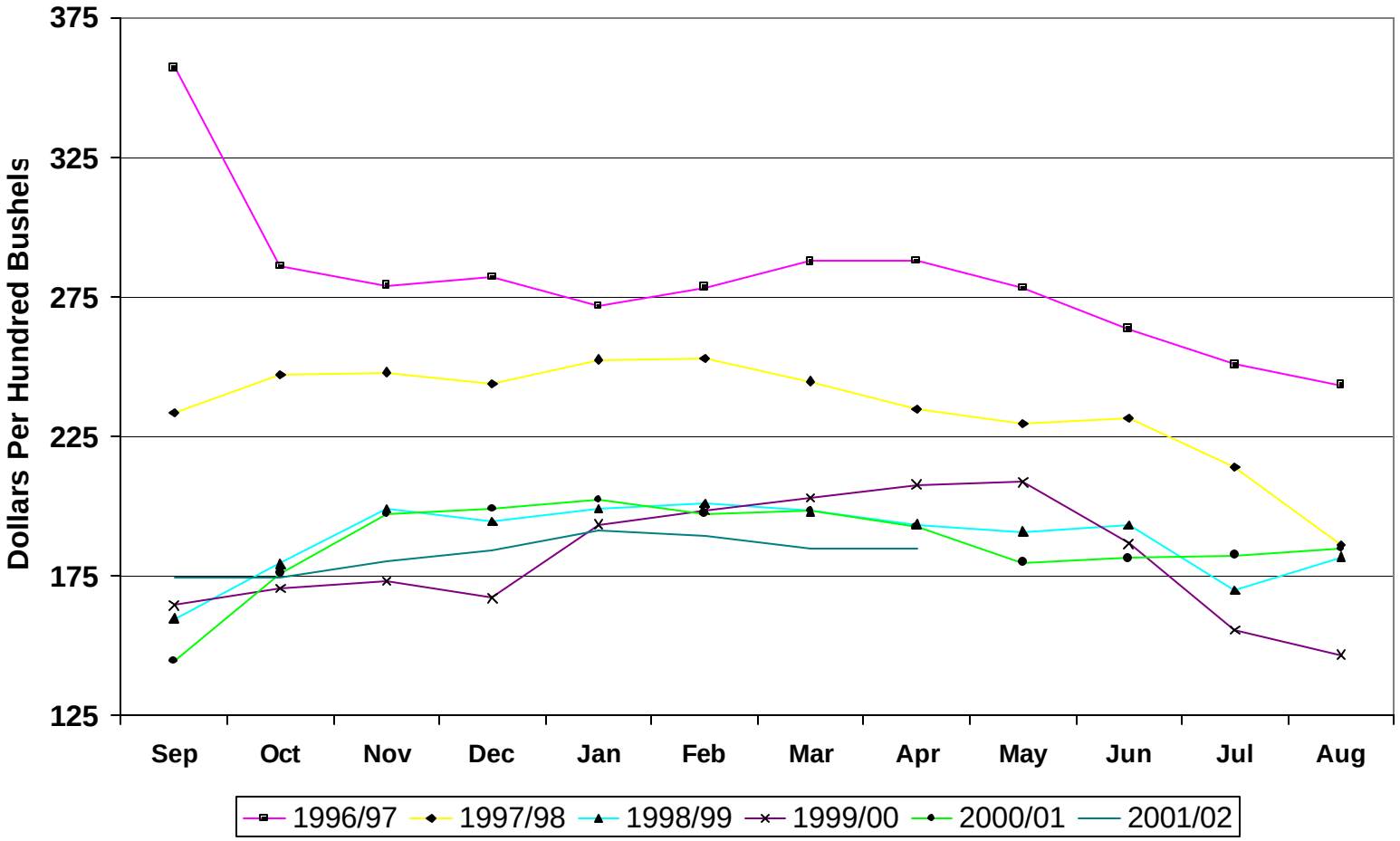


Figure 14: Corn Flat Price Trend, Wellington, Kansas

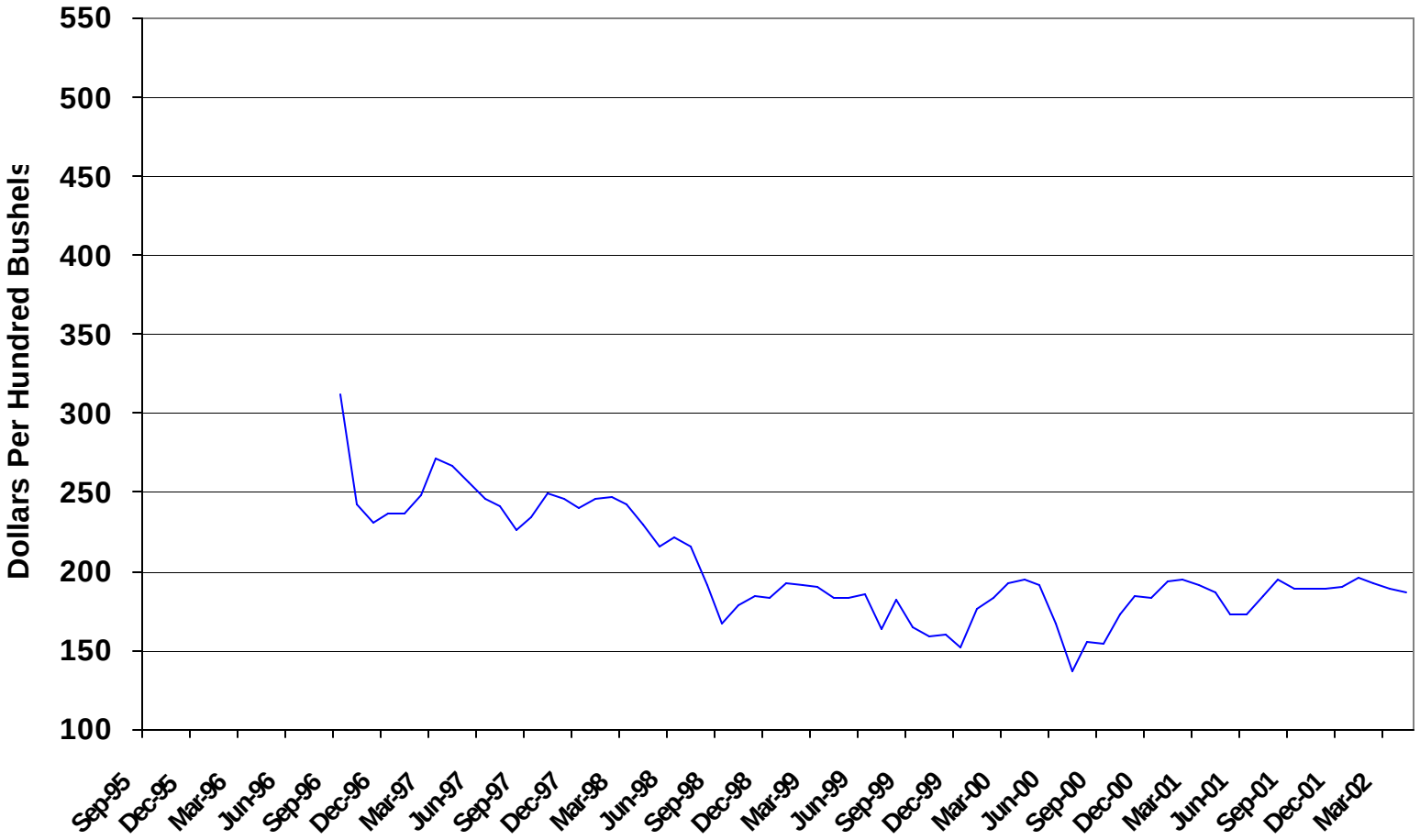


Figure 15: Corn Flat Price Seasonal Patterns, Wellington, Kansas

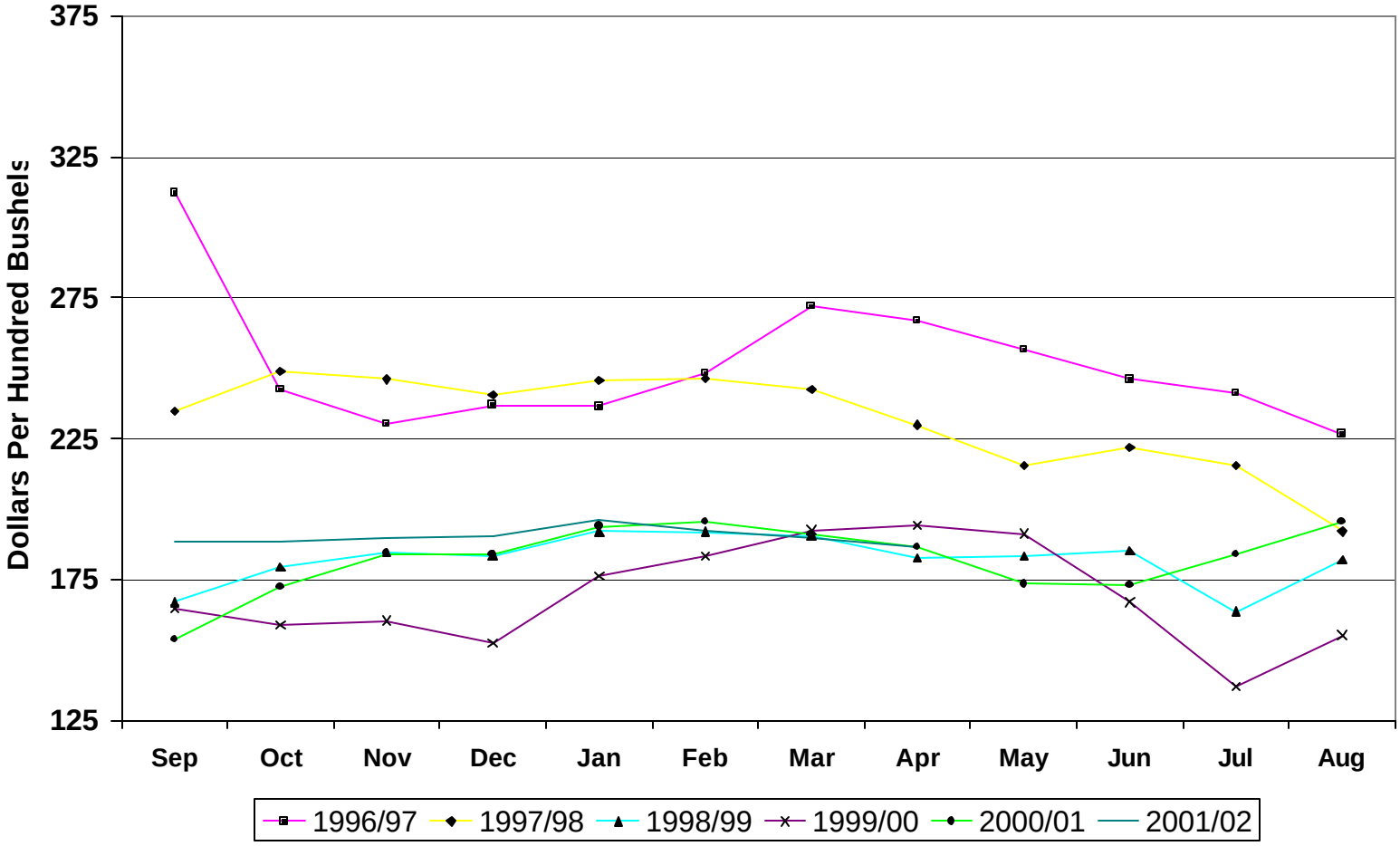


Figure 16: Corn Basis Summary, Chanute, Pittsburg & 'Wellington Kansas

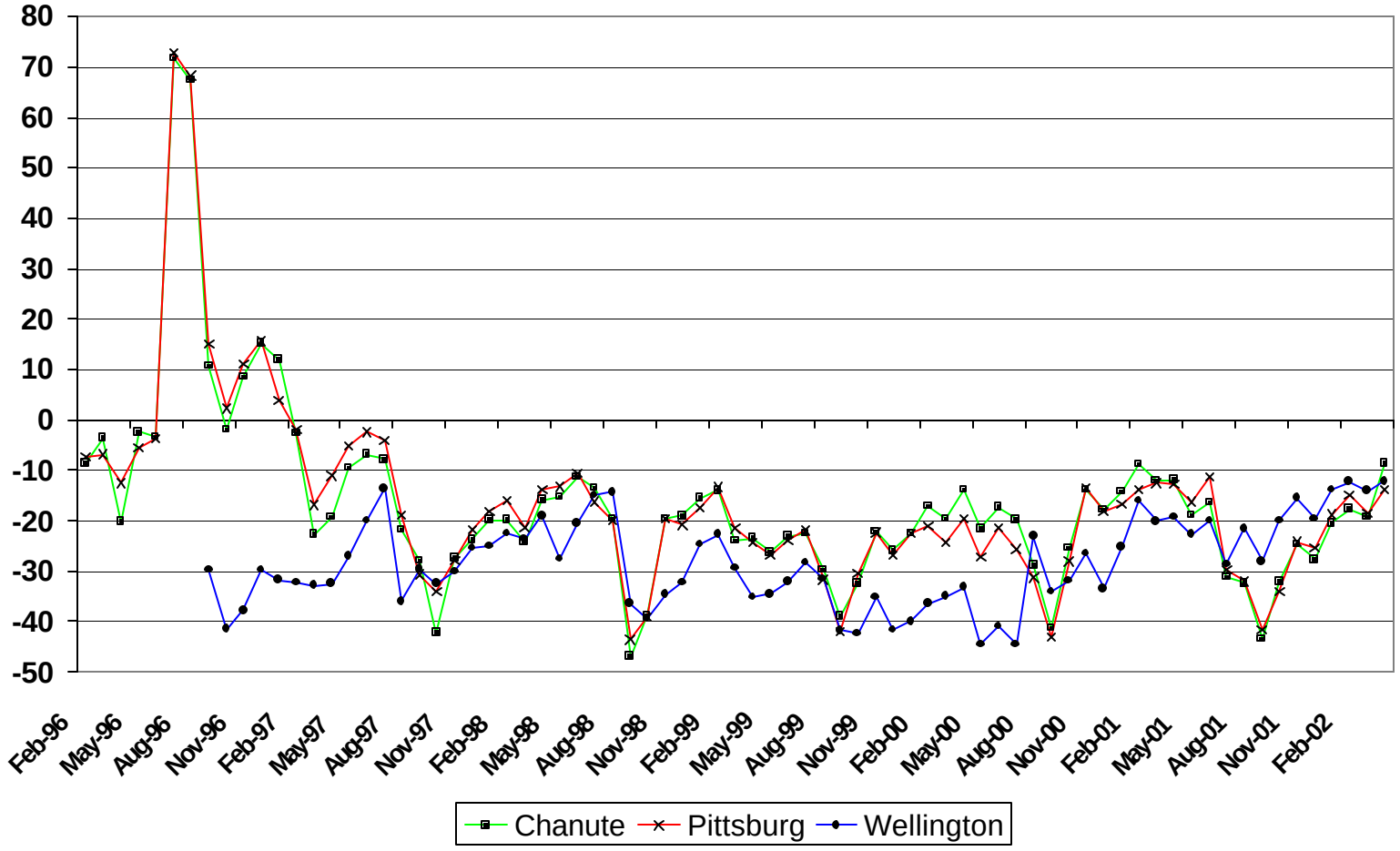


Figure 17: Corn Basis Trend, Chanute, Kansas

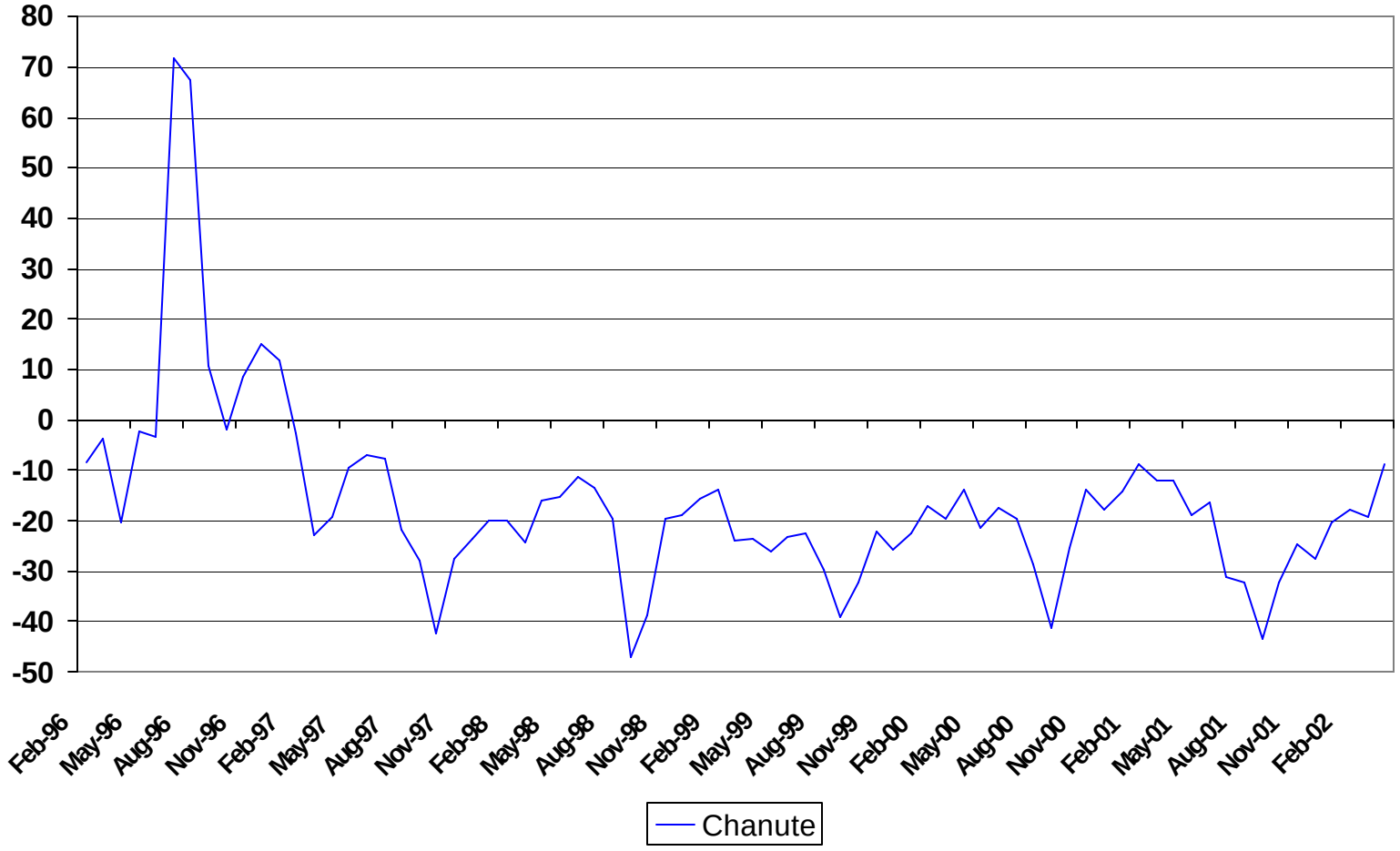


Figure 18: Corn Basis Seasonal Patterns, Chanute, Kansas

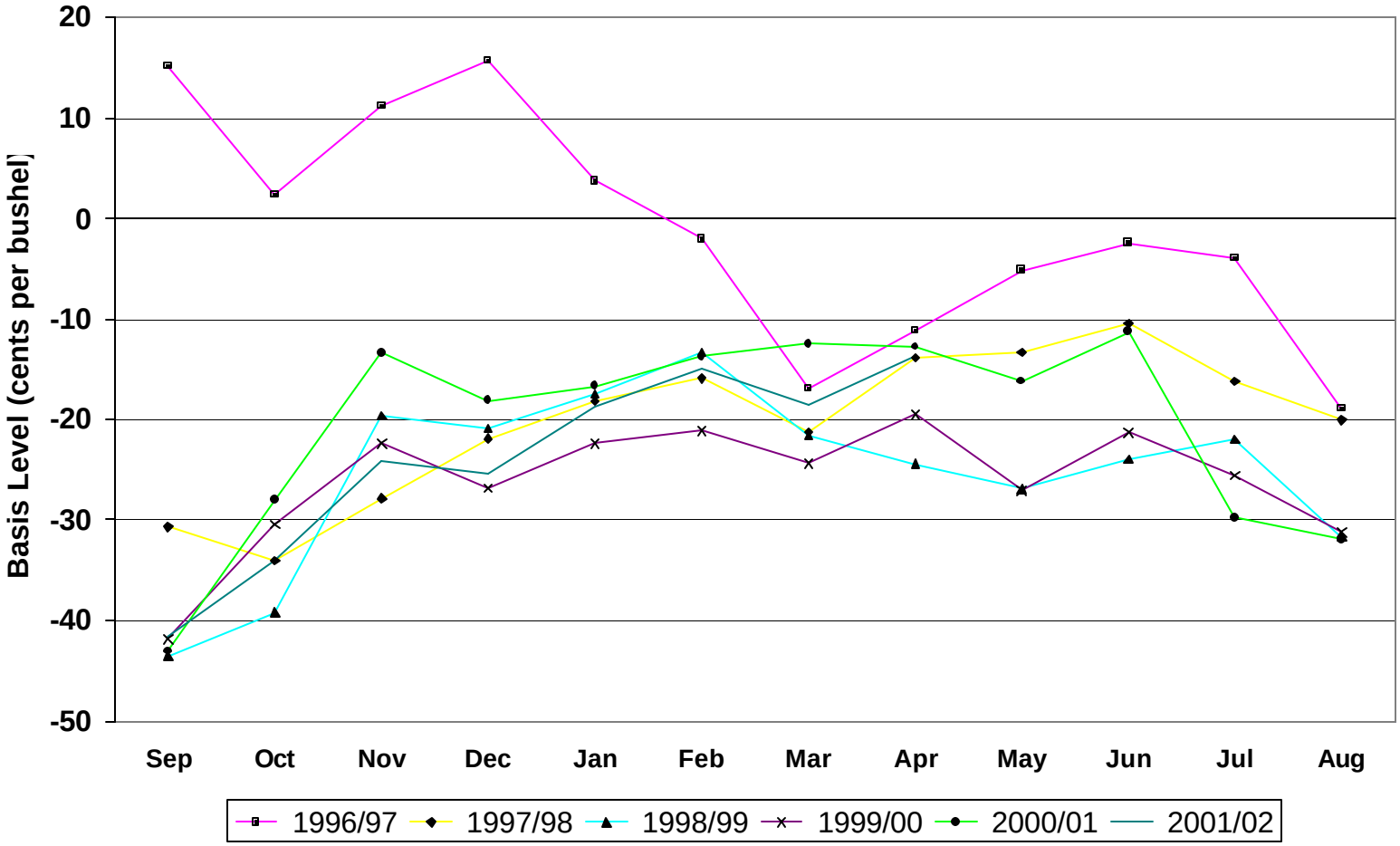


Figure 19: Corn Basis Trend, Pittsburg, Kansas

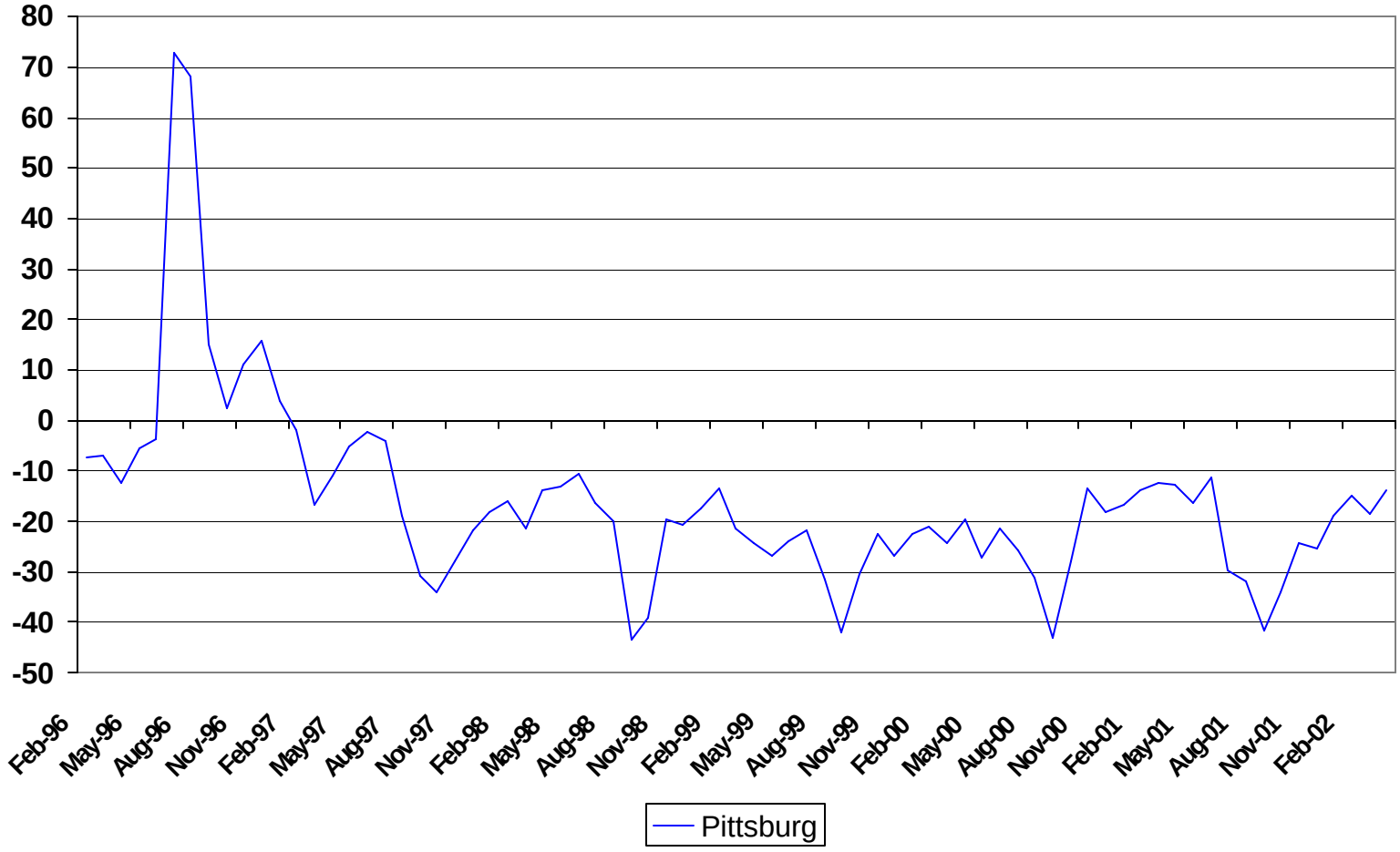


Figure 20: Corn Basis Seasonal Patterns, Pittsburg, Kansas

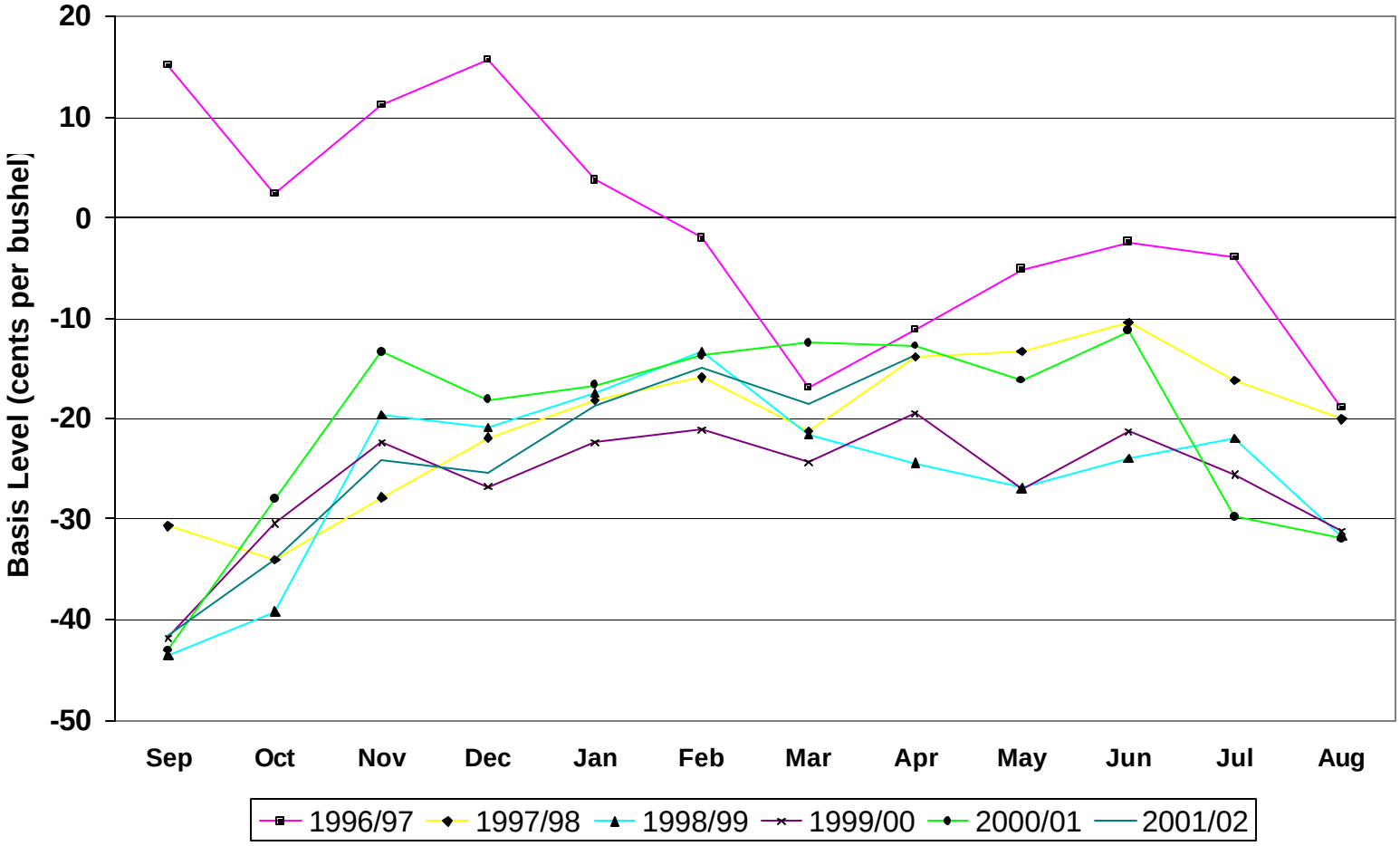


Figure 21: Corn Basis Trend, Wellington Kansas

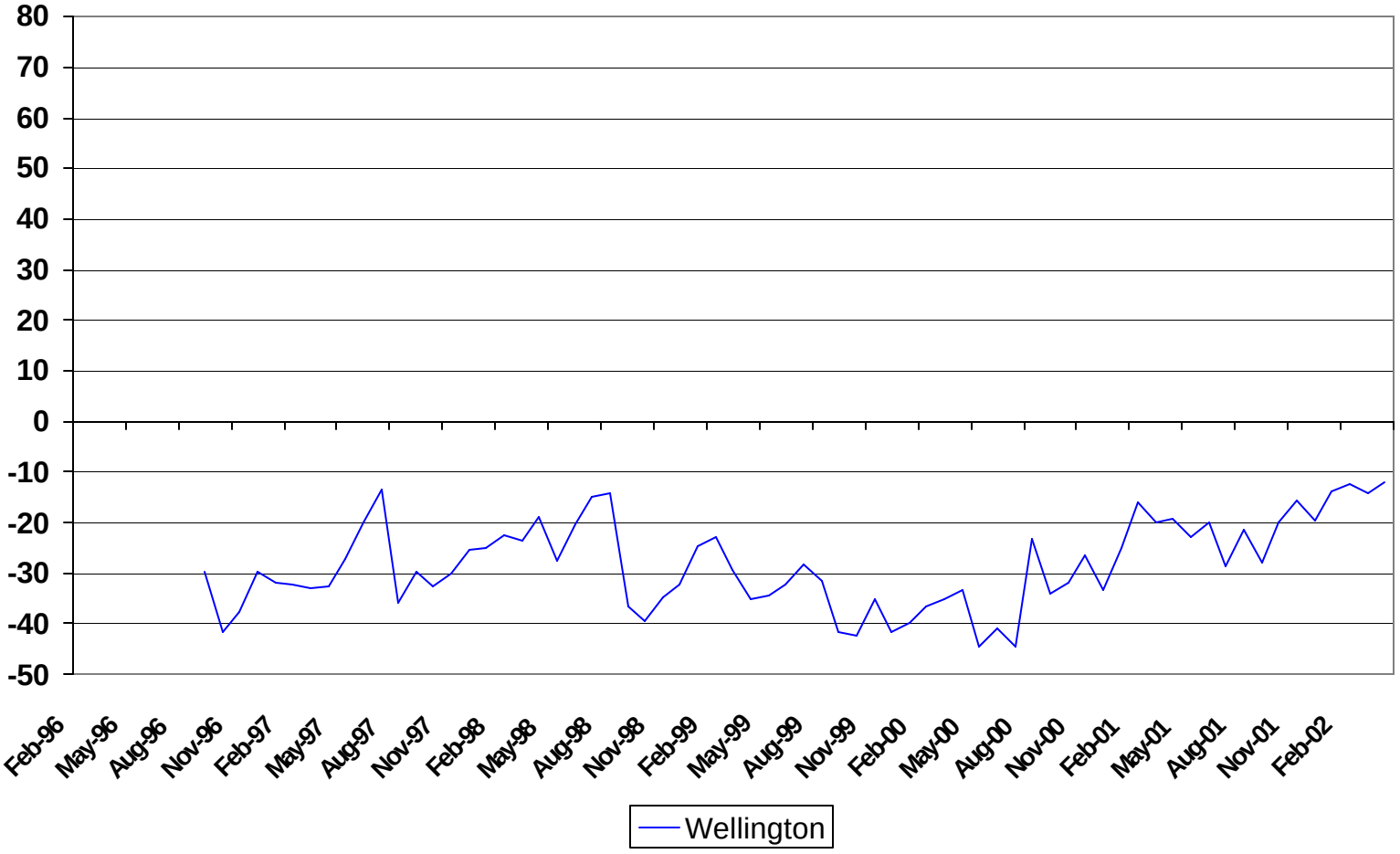


Figure 22: Corn Basis Seasonal Patterns, Wellington, Kansas