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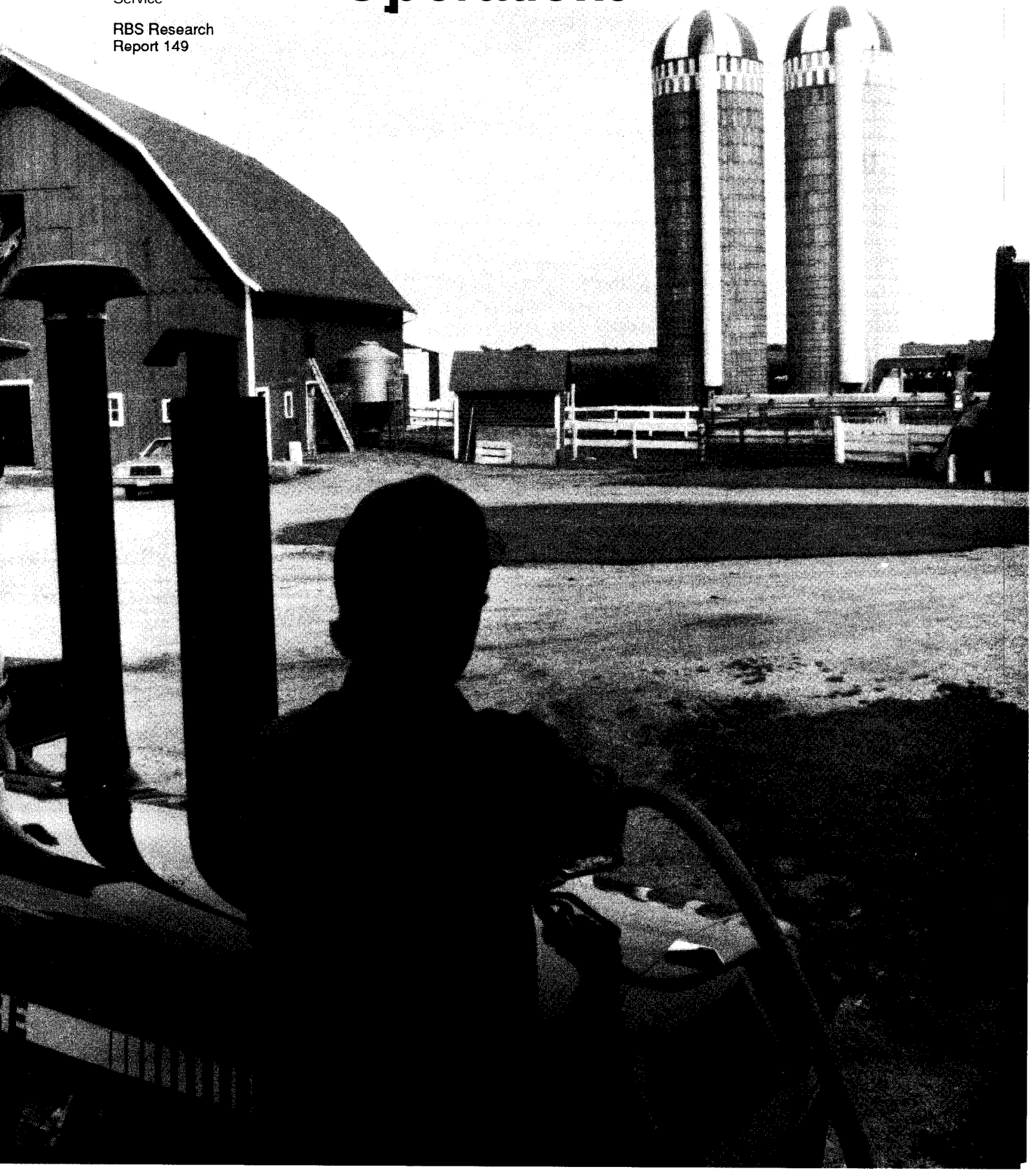
Local Petroleum Operations



Abstract

Local cooperatives play a prominent role in providing farmers with agricultural inputs. They are important to the farmer and the rural community as a whole. One of the most important products distributed to the rural community is petroleum. This report examines petroleum operations of local cooperatives and their importance to the rural community. The main emphasis is on cooperative product mix, services, supply source, and competition. Cooperatives are analyzed based on various characteristics such as size, type, and region.

Key Words: petroleum, local cooperatives, petroleum operation.

LOCAL PETROLEUM OPERATIONS
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Preface

Regional cooperatives rely on the local cooperatives as a direct link to the agricultural producer. Likewise, the locals are the agricultural producer's direct link to markets and supplies. Therefore, local cooperatives play a pivotal role in the rural community. Yet, they are more than just a provider of markets and agricultural supplies. The rural community looks to its local cooperatives for services that may not otherwise be provided in the surrounding communities. The largest commodity those local cooperatives supply to member/patrons is petroleum. This report identifies the petroleum products and services these locals provide for the rural community.

Contents

Highlights

Petroleum products power the machinery and tools used in agricultural production and account for more than a quarter of total cooperative farm supplies sold. More than two-thirds of the total marketing and farm supply cooperatives have petroleum sales. A number of characteristics pertain to cooperatives that sell petroleum products:

- Nearly 90 percent of the cooperatives selling petroleum have some form of bulk delivery of gas and/or diesel.
- Regional cooperatives are the main suppliers of petroleum products to the local cooperatives.
- More than 70 percent of the cooperatives operate a service station.
- Cooperatives operating a service station are more likely to offer other services such as sales and services of tires, batteries, and accessories, full-time mechanics, tire trucks for on-site farm service, and convenience stores.
- A higher percent of farm supply cooperatives operate a retail service station.
- Farm supply cooperatives sell a higher percent of petroleum products than marketing cooperatives.
- A higher percent of smaller cooperatives' total sales is attributed to petroleum products.
- Full service stations are more prevalent with smaller cooperatives and offer more services.
- Larger cooperatives are more likely to have bulk delivery than smaller cooperatives.
- Cooperatives in the northern regions deliver more bulk fuel.
- More fuel is sold at the retail level by cooperatives in the southern regions.
- The sale of ethanol-enhanced gasoline and premium diesel are more concentrated in the Midwest.
- Northern regions have a higher percent of cooperatives running a full service station and offer more services to their member/patrons.
- Cooperatives that sell only bulk generally do not offer services with their sales.
- Propane is sold in the northern regions, which accounts for 90 percent of all propane sold.

Local Petroleum Operations

Local agricultural cooperatives provide many goods and services to the rural community. The leading farm supplies handled by cooperatives in 1993 in terms of net business volume were petroleum products. Sales of petroleum products reached $5.2 billion, representing 26.9 percent of the total $19.2 billion farm supplies sold.

In 1993, more than 2,500 local cooperatives sold petroleum products in the United States. Recent RBS-Cooperative Services (CS) research by Eversull and Dunn shows that these cooperatives provided 41 percent of petroleum products used by farmers in the United States. This illustrates the importance cooperatives have in supplying petroleum products to the rural community.

This report examines characteristics and structure of these cooperatives and their distribution system. Emphasis is placed on operations and services provided, based upon various demographics.

Data

In its 1993 annual farmer cooperative survey, CS asked seven questions about local cooperative petroleum operations. Surveys were sent to all 4,244 farmer-owned cooperatives in the United States. Of these, 2,522 reported selling some type of petroleum product. Sales of petroleum ranged from less than $100 to more than $600 million for all cooperatives. The figures presented in this report represent the 738 cooperatives that responded to the survey and answered the 7 questions concerning petroleum operations.

The respondents were found in 31 States. Petroleum sales for these cooperatives averaged $2.1 million. The characteristics of these cooperatives vary by size, type, and region. To provide a better understanding of the cooperatives' business, this report analyzes information based on size, type, and geographical location. Tables 1 and 2 show the number of cooperatives in each of the different categories.

Size

Cooperatives were listed within each size category based on sales volume shown in table 1. These are similar to those used in other studies (Chesnick and Eversull) and are also used here because of the distinct differences between the operations of these size categories. The four sizes are small, medium, large, and super. The small-size cooperatives have total sales less than or equal to $5 million. The sales of medium-size cooperatives ranged from over $5 million to $10 million. The large-size cooperatives had sales from over $10 million to $20 million while the super-size cooperatives included those cooperatives with sales over $20 million. In classifying by sales volume, product mix is ignored. Two-thirds of these cooperatives have total sales of less than $10 million.

Table 1-Category and number of respondents by size and type

Size	Sales *volume*	*Respondents*
Small	$5 million and less	258
Medium	more than $5 million to $10 million	207
Large	more than $10 million to $20 million	155
Super	more than $20 million	118
Type	*Sales mix*	
Farm supply	100 percent farm supply sales	358
Mixed farm supply	40 to 100 percent farm supply sales	195
Mixed marketing	40 percent and less farm supply sales	185

Table 2—States listed by region and number of cooperatives in each region

Region	State	Number	Percent
Northwest	ID, OR, WA	27	3.7
Southwest	AZ, CA, NV, NM, UT	2	0.3
Western Plains	MT, CO, WY	39	5.3
Northern Plains	KS, NE, ND, SD	210	28.5
Southern Plains	TX, OK	29	3.9
Lake States	MI, MN, WI	153	20.7
Corn Belt	IL, IN, IA, MO, OH	218	29.5
Delta States	AR, LA, MS	24	3.3
Northeast	CT, ME, MA, NH, NJ, NY, PA, RI, VT, DE, MD	4	0.5
Appalachia	KY, NC, TN, VA, WV	30	4.1
Southeast	AL, FL, GA, SC	2	0.3

Type

Cooperatives were placed in three type classifications to analyze their operations based on product mix. The category for type diverged from those used in earlier CS research. The three groups included farm supply, mixed farm supply, and mixed marketing. Almost half the cooperatives within this study derive their total income from farm supply sales. Therefore, those classified as farm supply cooperatives sold exclusively farm supplies. The mixed farm supply group contains those that are predominantly farm supply cooperatives. The farm supply portion of total sales ranged between 40 and 100 percent while the other revenue came from marketing members' products. Like other studies, it was found that cooperatives shift between types due to fluctuations in marketing sales. Farm supply sales tend to be more stable over time. Therefore, to ensure inclusion of cooperatives that averaged sales of at least 50 percent farm supplies, the cutoff point is set at 40 percent. The last group is mixed marketing cooperatives whose predominant activity is marketing members' products.

Regions

To help identify characteristics relating to different locations, cooperatives are separated by regions. However, due to the reporting of a few centralized regional cooperatives, some regions are under-represented. Many regional cooperatives have centralized ownership, i.e., they own their local outlets. Because of this, local petroleum operations and sales data were not available from these regional cooperatives. Three regions (Southwest, Northeast, and Southeast) are not included because few local cooperatives in these areas responded to the survey. They are not aggregated because of the diverse agricultural practices. The regions with the most responses are the Lake States, Corn Belt, and the Northern Plain States. Alaska and Hawaii are not included.

Sales Method

A final grouping further separates the cooperatives: 1) sell only bulk petroleum; 2) operate only a retail operation; and 3) mixed with both retail and bulk operations. The cooperatives with only a bulk delivery operation account for 14 percent of the 738 cooperatives sampled. Although only a few cooperatives sell only bulk fuel, the cooperatives in this group relied on marketing for a majority of their sales revenue. The average volume of petroleum sold in this group is less than the other two groups. The highest petroleum sales along with farm supply sales are found in the mixed group.

Sales

Average sales profiles as a percent of total sales are illustrated in table 3. The degree petroleum contributes to the operations of many local cooperatives changes dramatically depending on type, size, and region. Petroleum contributes to more than 40 percent of total sales for small farm supply cooperatives. This contrasts with less than 10 percent for super and mixed marketing cooperatives. Still, petroleum products represent the largest percent of farm supply sales for all cooperatives.

Type

Among farm supply cooperatives, a higher percentage of their total sales are attributed to petroleum products (table 3). Other supplies, which typically include tires, batteries, and auto accessories (TBA), also show up as

Table 3—Percent of product sales to total sales for respondent cooperatives by size, type, and region

	Petroleum	Feed	Seed	Fertilizer	Chemical	Other	Farm supply	Marketing
Cooperative								
All cooperatives	17.66	9.33	1.23	10.56	7.91	6.92	53.80	46.20
Farm supply	39.28	11.11	2.07	17.79	13.09	16.67	100.00	0.00
Mixed farm supply	17.84	14.44	1.38	11.81	9.24	6.22	60.93	39.07
Mixed marketing	7.45	5.39	0.74	'6.32				
	42.52	9.39	1.54	12.81	***8.87***	13.22	88.35	11.65
Medium	25.89	11.86	1.71	14.47	***10.72***	9.54	74.18	25.821
Large	19.67	10.20	1.47	11.68	***8.98***	7.79	59.79	40.21
Super	10.33	8.08	0.90	8.34	***6.28***	3.87	37.81	62.19
Northwest	27.93							

a higher percentage in farm supply cooperative sales. Even when looking at just farm supply sales, the farm supply cooperatives still sell a higher percent of petroleum, more than 10 percentage points higher than the other two cooperative types.

Size

The four cooperative sizes also show significant differences in sales mix. The typical small-size cooperative relies heavily on petroleum for sales revenue. For these cooperatives, petroleum sales average nearly 50 percent of their total farm supply sales while the largest cooperatives average only 27 percent. Although larger cooperatives derive more of their sales from marketing operations, they still sell a higher percentage of petroleum than other farm supplies. However, the farm supply sales mix becomes more diversified as sales volume increases.

Regions

Source

to- livered directly

tive affiliates and 12 percent to their directly locals. The other 31 percent went to resellers or nonco- operative outlets. Affiliated locals purchased 66 per-

Table 4—Average source of petroleum supply for local cooperatives

	Regional co-ops	Other co-ops	Major Oil Co.	Indep.jobber	Other
Product			*Percent*		
Gasoline	87.90	1.52	4.28	6.08	0.16
Diesel	87.54	1.52	4.87	5.91	0.17
Propane	79.85	3.25	4.38	11.81	0.99
Lubricants and oil	89.91	3.01	3.52	3.17	0.29
Grease	92.45	2.51	2.84	1.96	0.23

cent of their distillate fuels and the directly owned locals accounted for 22 percent. Local affiliates accounted for 76 percent and regionally controlled outlets 21 percent of their propane sales. Therefore, local cooperatives are a key component of the network for distributing cooperative-produced petroleum products to the farm.

Type

There are little differences between the types when examining supply sources. All of the cooperative types follow similar patterns described earlier. Even though the regionals are the main supply source for petroleum products for affiliated locals, farm supply cooperatives are showing more reliance on the independent jobbers for the remainder. Farm supply cooperatives receive 7.5 percent of their gasoline and diesel supply from independent jobbers and only about 3 percent from major oil companies. The other two types receive around 6 percent from the major oil companies and roughly 4 percent from independent jobbers.

Size

As in the type comparison earlier, the various sizes remain close to overall averages. Although super-size cooperatives rely somewhat less than others on regionals for gasoline and diesel, they still received more than 80 percent of their supply from regionals. The small- and large-size cooperatives show a larger propensity for regional supply while the medium-size cooperatives followed overall averages. On the other hand, the super-size cooperatives purchase 95 percent of lubricating oil and grease from regionals compared with 85 percent of the smallest size cooperatives.

Regions

Locals within the various regions rely on regional cooperatives for nearly 85 percent of their petroleum source. Two regions deviated from this pattern. In Appalachia, regionals supplied about 66 percent of their gasoline and diesel while the other third came from major oil companies and independent jobbers. Conversely, locals in the Northern Plains look to their regionals for 95 percent of their gasoline and diesel supply.

Regionals in Appalachia are more likely to be centrally controlled and own their local outlet. These local outlets were not surveyed. Therefore, survey results in this region do not reflect overall cooperative activities as well as in other regions. Respondent locals in this region tend to be independent, not tied to regional cooperatives in a federated or centralized system. Therefore, their purchasing behavior is different than other parts of the county. These independent local Appalachia cooperatives look for the most convenient or cheapest source.

In contrast, federated regionals dominate the Northern Plains and have a strong bond with the locals. Unlike the locals within the centrally controlled system, federated locals are not controlled by the regional. The federated locals are more accustomed to working together within a regional system than the more independent locals.

Equity investment in regionals can be used to help illustrate this point. Local ownership in the regional is represented by this equity investment. In the Northern Plains, $638,000 or 26 percent of total assets are represented by these investments in contrast to $218,000 which represents 14 percent for Appalachia.[1]

Fuel Type and Volume Sold

Nearly 90 percent of all locals deliver bulk petroleum products to their member/patrons and about 80 percent of the locals have some retail operation (table 5). The product with the highest average volume sold in

[1] These investments do not include the equity held in CoBank or Bank for Cooperatives.

bulk is diesel. Bulk sales are delivered directly to the member/patron while retail and wholesale are sold at the cooperative. Of those who deliver bulk, nearly 63 percent of their total average volume of diesel sold is in bulk form. Retail and wholesale sales make up 18 and 19 percent of the sales, respectively. On the other hand, 48 percent of gasoline sold is retail volume while bulk and wholesale make up 34 and 18 percent, respectively. Although the average wholesale volume is substantial (about 20 percent of total petroleum sales for those cooperatives that have wholesale operations), only 11 percent of the cooperatives within the sample have wholesale petroleum operations.

Type

Proportionally more farm supply cooperatives are involved in retailing petroleum than either the mixed farm supply or mixed marketing cooperatives (table 6). Mixed marketing cooperatives are the least involved in retail sales, although 75 percent indicate some level of retail sales.

Size

The size of the cooperative appears to have a different influence on how petroleum products are delivered. The main differences between the various sizes are the percentages of cooperatives selling wholesale and bulk deliveries. Seventeen percent of the largest cooperatives, compared with seven smaller ones, have wholesale operations. The larger cooperatives also are more likely to have bulk delivery. Retail operations were very similar among the four sizes.

Bulk operations are more capital-intensive and operating costs are higher. These capital requirements can be prohibitive for smaller cooperatives. For instance, larger storage tanks are needed along with

Table +-Methods and average volume of fuel sold for all cooperatives

	Gasoline, all types			Distillate, all types		
	Retail	Wholesale	Bulk	Retail	Wholesale	Bulk delivery
Volume in gallons	541,158	207,213	387,754	239,003	263,513	850,016
Percent of co-ops selling	81.2	11.2	89.0	77.5	10.6	89.1

Table 6—Methods and average volume of fuel sold by type and size

	Gasoline, all types			Distillate, all types		
	Retail	Wholesale	Bulk delivery	Retail	Wholesale	Bulk delivery
Farm supply						
Volume in gallons	603,185	**162,126**	**386,603**	261,726	195,835	858,532
Percent of co-ops selling	83.0	**9.5**	**88.1**	82.9	9.6	88.8
Mixed farm supply						
Volume in gallons	**541,905**	**189,000**	**445,635**	212,474	**368,160**	1,006,348
Percent of co-ops selling	**79.4**	14.0	**90.2**	75.8	12.9	89.7
Mixed marketing						
Volume in gallons	403,688	**303,626**	**328,195**	216,930	246,929	670,450
Percent of co-ops selling	75.0	**11.4**	89.1	69.0	**10.3**	90.8
Small						
Volume in gallons	282,652	**181,872**	235,929	121,373	**208,842**	449,426
Percent of co-ops selling	80.9	**7.0**	**85.5**	77.7	**7.0**	85.9
Medium						
Volume in gallons	**554,106**	**105,802**	**332,433**	243,502	**106,078**	731,561
Percent of co-ops selling	**75.2**	**9.2**	**89.3**	75.2	**9.2**	89.3
Large						
Volume in gallons	**696,513**	230,907	**463,388**	343,448	**329,970**	1,139,459
Percent of co-ops selling	83.8	12.3	**90.2**	79.9	**13.0**	91.5
Super						
Volume in gallons	867,688	323,394	**684,291**	346,591	**398,558**	1,468,902
Percent of co-ops selling	81.4	17.8	**94.7**	78.0	**17.0**	94.9

delivery trucks. This equipment requires maintenance that can prove to be expensive. Small cooperatives may not have adequate cash-flow to support such an operation.

On the bulk selling side, discounts are common with bulk fuels compared with retail sales. Therefore, with lower margins and higher costs, it takes larger sales to support bulk operations.

Regions

Table 7 shows the average volume of fuel sold at the retail, wholesale, and bulk levels, by region, as well as the percentage of local cooperatives operating at each level. The regional differences are significant. Further, these differences are less dependent on size or type than expected. For example, in the Northwest region, nearly a third of the cooperatives sold petroleum at the wholesale level, despite the fact that the region has a high concentration of smaller farm supply cooperatives.

The Appalachian and, to a lesser extent, the Delta region deviate quite a lot from the "typical" cooperative discussed earlier. In Appalachia, nearly one-third of the cooperatives are either exclusively bulk or retail operations. In the other regions, most cooperatives generally have both. While it was also shown earlier that for the United States as a whole, more cooperatives sell fuel in bulk than in retail, this is not the case with regional data. For example, in the Southern Plains, more than 93 percent have a retail operation while less than 73 percent have a bulk operation.

Other Products

Other petroleum products that cooperatives sell include gasohol, premium diesel, propane, lubricating oil, and grease. Table 8 provides the average volume of each category for different types, sizes, and regions. Because of the nature of farm supply cooperatives, many of their petroleum products such as premium diesel and refined lubricants and oils are geared toward farm production and not for highway trucks. Programs emphasizing premium diesel focus on getting these products directly to the farm.

Table 7—Methods and average volume of fuel sold by region

	Gasoline, all types			Distillate, all types		
	Retail	Wholesale	Bulk delivery	Retail	Wholesale	Bulk delivery
Northwest						
Volume in gallons	882,826	290,321	744,723	374,210	151,627	1,103,219
Percent of co-ops selling	85.2	29.6	77.8	85.2	22.2	77.8
Western Plains						
Volume in gallons	462,185	108,242	427,486	232,707	447,787	704,646
Percent of co-ops selling	86.8	15.8	89.5	84.2	10.5	89.5
Northern Plains						
Volume in gallons	481,565	214,527	299,234	233,410	247,438	562,725
Percent of co-ops selling	89.9	9.6	96.6	87.0	9.1	96.6
Southern Plains						
Volume in gallons	449,541	31,237	228,361	359,084	162,205	653,124
Percent of co-ops selling	93.1	6.9	69.0	96.6	10.3	72.4
Lake States						
Volume in gallons	778,343	144,259	320.836	243,440	184,369	799,367
Percent of co-ops selling	84.3	10.5	92.2	83.0	10.5	92.2
Corn Belt						
Volume in gallons	444,943	243,712	534,855	206,411	344,205	1,225,850
Percent of co-ops selling	72.4	13.4	91.7	66.4	12.9	91.7
Delta States						
Volume in gallons	268,155	290,625	196,323	241,237	N/A	892,983
Percent of co-ops selling	87.0	4.4	60.9	65.2	N/A	65.2
Appalachia						
Volume in gallons	488,023	N/A	144,415	165,204	25,498	554,220
Percent of co-ops selling	60.0	N/A	66.7	53.3	3.3	70.0

N/A = Not Available

This niche market gives cooperatives a competitive advantage in the rural market. A recent report by Eversull and Dunn indicated sales of premium diesel grew substantially from 1988 to 1993. However, this was not accompanied by an overall increase in distillate products sold. Nearly 70 percent of the average total volume of distillate fuel sold by cooperatives is premium diesel. Most cooperatives carrying premium diesel deliver it primarily to farm accounts and do not rely on highway traffic for diesel sales.

Similarly, ethanol-blended gasoline sales increased tremendously during the same period, while total gasoline volume remained unchanged. In 1993, the average volume of gasohol sold represented about 30 percent of total gasoline volume. However, only 63 percent of the respondents who provide gasoline to member/patrons sell ethanol-blended gasoline. Sixty-eight percent of all local cooperatives sell propane.

Type

There is little difference between the various types of cooperatives when comparing gasohol and premium diesel sales. However, differences emerge when comparing propane, lubricants, and grease. More farm supply cooperatives sell these products than the other two types (table 8). Yet, these numbers do not tell the whole story. Lubricants and grease are often sold under tire, batteries, and auto accessories (TBA). A higher percent of farm supply cooperatives also have an automotive section where they sell TBA. If considering only those cooperatives selling TBA, the comparisons between the types of cooperatives carrying these other petroleum products become much more pronounced. Farm supply cooperatives continue to show a higher percentage (90.8) than mixed farm supply (74.2) and mixed marketing (68.6).

Size

Not only do larger cooperatives sell more than smaller cooperatives, but there is a higher percentage of them selling these other petroleum products. This is especially evident with gasohol. For example, 72 percent of the super-size cooperatives sell gasohol compared to 55 percent of the small-size cooperatives. The most probable cause is location. Ninety percent of all super-size cooperatives are found in the Northern Plains, Lake States, and Corn Belt, where a substantial amount of ethanol is produced.

Regions

The regions differ in terms of other types of fuel sold. More cooperatives in the Northern Plains, Lake States, and Corn Belt provide ethanol-blended gasoline and premium diesel than in other regions. Even though a lower number of cooperatives carry gasohol in the Northwest, Southern Plains, and Delta regions, they tend to sell a higher volume. For example, in the Southern Plains, only 10 percent of cooperatives carry

Table 8-Average volume of other petroleum products by types, sizes, and regions

Gallons	Gasohol		Premium diesel		Propane		Oil and grease	
	volume	pct.	volume	pct.	volume	pct.	volume	pct.
All cooperatives	335,891	60	663,925	68	908,712	68	18,502	78
Farm supply	365,238	59	634,557	67	828,891	74	17,391	85
Mixed farm supply	349,238	59	755,333	67	1,111,070	68	22,088	73
Mixed marketing	271,852	65	627,020	71	855,024	59	17,183	70
Small	282,798	55	379,884	68	550,677	68	10,559	84
Medium	297,547	57	555,173	63	767,317	63	20,697	72
Large	319,215	65	803,946	71	1,090,144	69	19,849	74
Super	496,984	72	1,217,473	74	1,557,096	80	31,227	81
Northwest	674,398	30	848,368	30	111,066	59	24,464	85
Western Plains	308,200	26	673,324	61	544,780	74	16,409	82
Northern Plains	271,886	66	520,072	76	590,369	83	22,085	84
Southern Plains	936,461	10	723,327	48	507,843	38	13,838	69
Lake States	344,967	77	519,483	79	1,029,450	83	16,180	90
Corn Belt	358,133	76	905,794	76	1,447,253	62	17,671	74
Delta States	520,290	4	1,205,706	13	729,120	13	6,937	30
Appalachia	NA		276,368	23	28,765	20	17,519	43

gasohol, yet those cooperatives selling gasohol averaged nearly 1 million gallons per year. Cooperatives selling ethanol-enhanced gas in the Northern Plains, Lake States, and Corn Belt typically sell less than half that amount. Typical of the regions with a low number of cooperatives selling a high volume of gasohol, nearly all of the gasoline sold was ethanol-enhanced. In the Southern Plains and the Delta States where only about 10 percent of the cooperatives sell gasohol, it accounts for almost 100 percent of their total gasoline volume. With some of the other regions, where the volumes of gasohol are relatively small and the number of cooperatives selling gasohol is numerous, less than half the gasoline sold is ethanol-enhanced.

The characteristics of cooperatives selling premium diesel are similar to those selling gasohol. With the exception of the Corn Belt, the regions with the highest volume of premium diesel sold generally have the lowest number of cooperatives selling premium diesel. In the Southern Plains, for example, less than 50 percent of their cooperatives sell premium diesel, yet the volume for those that sell premium diesel totaled more than 90 percent of their gross diesel sales. In regions such as the Lake States, more than 75 percent of the cooperatives sell premium diesel. However, premium diesel amounted to only half of their gross volume of diesel sold.

Propane sales are concentrated in the Western Plains, Northern Plains, Lake States, and Corn Belt regions. These four regions represent 92 percent of the total number of cooperatives selling this type of fuel. Propane is generally associated with home heating, therefore, it would be expected that these northern regions have higher sales. This holds for most northern regions except the Northwest where cooperatives are not large suppliers of propane, even though nearly 60 percent of all cooperatives sell it. The average volume of propane sold by Northwest region cooperatives is substantially below that of the other regions, except for Appalachia.

Storage

Fuel storage is a major concern for many cooperatives. Leaks from tanks and upgrades to bring the tanks into code are expensive. This is especially true for underground tanks that must be excavated. This disruption of service can place considerable pressure on a cooperative's cash-flow. The aboveground storage tanks have a larger volume than those below ground. The majority of cooperatives also use aboveground storage. However, this probably has more to do with bulk sales than environmental concerns. Table 9 presents the average capacity for storage tanks of each type of fuel.

Another way to look at storage capacity is to examine the volume turnover. This ratio is defined as the volume of petroleum sold divided by the volume of storage capacity. Table 10 shows this turnover ratio by fuel type and sales method. If the cooperative operates a retail station and has underground tanks, it is assumed these tanks are for the retail station and retail sales volume is used. If the cooperative has aboveground storage and bulk delivery, it is assumed the aboveground storage is for bulk. If the cooperative had both retail and bulk, as the majority of cooperatives did, aboveground tanks were used with bulk and tanks below ground were associated with retail. Also included with aboveground storage is wholesale fuel. Table 10 shows that retail stations have higher sales in relation to storage capacity than bulk centers.

Several factors can help explain the differences between these ratios. The retail station tanks are generally smaller than those used for bulk because retail sales are typically sold in small units, i.e., 10 to 20 gallons at a time, while the bulk inventory could be drawn down in units as large as 5,000 gallons at a time. Also the service station has a continuous flow of traffic throughout the year and the amount of fuel needed is fairly stable and predictable, so there is no need to carry excess capacity. Bulk sales, however, are likely to be seasonal, with most sales coming in the

Table 9—Range of storage capacity for petroleum products above and below ground

	Gasoline	Distillate fuels	Propane [1]
		Gallons (1.000)	
Above ground	20 - 80	30-120	20 - 60
Below ground	8 - 40	4 - 30	n/a [2]

[1] Underground storage of propane is rare, less than 1 percent.
[2] Not available.

spring and fall during planting and harvesting. Cooperatives need the larger storage capacity during the peak months.

If the cooperative is located on a major highway, the higher turnover for gas at the retail service stations is probably due to the higher volume of car traffic. Therefore, the gasoline sales volume will be higher than diesel at the retail center, accounting for the higher turnover. Where the principal patrons are farmers, more diesel than gasoline can be expected to be sold, accounting for the higher turnover of diesel in locals offering bulk delivery.

As would be expected, larger cooperatives have a greater average storage capacity than smaller cooperatives. However, that did not always imply lower per-unit cost. According to a recent report by Dahl, Cobia, and Dooley, the least-cost bulk storage facility is around 50,000 gallons regardless of the sales volume. The researchers examined several cooperatives in North Dakota and found this size facility places little or no constraints on operations. Delivery from terminals to the cooperative is reliable and easily scheduled. Although the storage capacity of 30 percent of the cooperatives sampled exceed 60,000 gallons, no single size category dominated this segment. The capacities in excess of 50,000 gallons are likely due to multiple storage locations or uncertainty of future supply and prices.

Services

Cooperatives not only sell petroleum products, but also offer other related operations and services (table 11). Over 70 percent of local cooperatives operate a retail service station. Most cooperatives also provide

Table 10—Storage turnover ratios by types, sizes, and regions

	Retail sales		Bulk deliveries	
	Gasoline	Diesel	Gasoline	Diesel
			Ratio	
All cooperatives	27.54	18.81	8.76	12.78
Farm supply	28.15	17.91	8.70	12.43
Mixed farm supply	27.71	19.63	9.52	15.18
Mixed marketing	25.29	20.68	8.10	11.03
Small	25.17	16.36	7.19	9.53
Medium	30.93	20.46	9.30	13.26
Large	25.34	20.09	9.02	15.24
Super	31.19	20.49	10.79	15.55
Northwest	22.35	15.57	17.84	21.23
Western Plains	28.58	25.16	10.91	15.82
Northern Plains	30.63	20.76	7.32	10.01
Southern Plains	12.69	11.87	17.06	21.93
Lake States	25.49	17.31	8.18	12.05
Corn Belt	28.42	**19.64**	**9.23**	13.33
Delta States	31.31	12.70	7.02	19.36
Appalachia	25.44	8.44	8.37	17.39

Table ii—Percent of cooperatives providing various operations and services to members

Operation	Percent	Service	Percent
Retail service station	70.85	Mechanic for major repairs	22.17
Convenience store	42.04	TBA sales and installation	64.25
Tire truck (on farm service)	47.49	Card or key activated pumps	70.94
Franchise outlet (Midas, etc)	5.14	Furnace and A/C service/repair	25.25
Video tape sales and rental	18.35	Petroleum sales specialist	46.75
Other operation	1.69	Other services	1.32

tires, batteries, and auto accessories (TBA) sales and services. Sixty-four percent of those cooperatives sampled had TBA sales and services. The percentage offering TBA increases to nearly 85 percent if the cooperative operates a service station. Services of mechanics for major repairs are offered by 22 percent of cooperatives. As might be expected, there is also a high correlation between employing a mechanic and operating a service station.

About 50 percent of cooperatives selling petroleum products also offer a tire truck for on-farm servicing. Nearly 90 percent of those cooperatives equipped with a tire truck service also operate a service station.

Card- or key-activated pumps, which allow members access to pumps during off-hours, are offered by 71 percent of the cooperatives. However, the presence of a card- or key-activated pump is unrelated to the operation of a full service station by the cooperative.

With a relatively small number of customers spread out over a larger area, deliveries to members can be costly. These low-density regions require many delivery truck miles. About half of the local cooperatives employ a petroleum sales specialist who coordinates large bulk sales and deliveries to member/patrons. Nearly all cooperatives employing a petroleum sales specialist have bulk delivery. The petroleum specialist coordinates product delivery to members and helps lower transportation cost. Cooperatives in the low-density areas are more likely to have "keep full" contracts which allow the cooperative to coordinate scheduled stops to refill the tank. This will give the cooperative more control to coordinate deliveries to members and lowers transportation costs. Having a coordinator for this function can greatly improve efficiency and lower costs.

Furnace and A/C service and repairs are provided by 25 percent of the surveyed cooperatives. This service primarily ties in with propane sales for home heating and crop drying. Ninety-two percent of the cooperatives that provide furnace and A/C repairs and services also sell propane.

In the rural community, stores and repair shops could be many miles away in the nearest town. In many instances the local cooperative is the nearest business. Consequently, the importance of the cooperative in providing a convenient access to basic everyday home products becomes evident. Forty-two percent of the cooperatives operate a convenience store. Although the store may only carry a limited variety of products, a quick trip to the cooperative for bread, butter, milk, or even flashlight batteries could save the patron more time than a trip into town. Eighty-five percent of those cooperatives operating a convenience store also run a full service station.

Type

One of the biggest differences between types of locals is the amount of services provided to member/patrons. Table 12 lists some of the major ser-

Table 12 — Percent of cooperatives providing selected services by type, size, and region

	Service Station	C-store	Tire Truck	TBA	Card- Key-Activated Pump	Mechanic	Petroleum Specialist
				Percent			
Farm supply	76.62	50.14	51.91	75.17	73.02	30.01	51.57
Mixed farm supply	66.37	36.97	41.40	55.66	64.07	14.36	36.49
Mixed marketing	57.40	28.64	45.09	48.77	75.09	13.50	49.54
Small	84.72	34.99	48.77	78.13	67.85	30.57	44.57
Medium	63.96	42.30	45.42	64.85	69.27	21.12	42.37
Large	69.83	48.51	45.13	61.99	65.77	21.28	38.55
Super	68.92	40.21	50.74	56.93	79.33	1a.54	59.83
Northwest	59.26	32.23	7.41	44.44	88.89	11.11	58.49
Western Plains	78.95	30.53	52.63	76.31	68.42	7.89	44.76
Northern Plains	80.77	42.54	57.21	75.48	71.15	28.85	43.78
Southern Plains	65.52	20.00	27.59	62.07	82.76	0.00	12.59
Lake States	70.59	76.79	44.44	72.55	60.13	32.03	41.26
Corn Belt	42.86	24.06	22.12	36.87	53.00	8.76	54.82
Delta States	69.57	25.22	26.09	82.61	4.35	0.00	26.46
Appalachia	56.67	9.67	50.00	66.67	40.00	20.00	36.41

vices along with the percent of cooperatives within each type providing them. With the exception of card- or key-activated pumps, most farm supply cooperatives offer more services than strictly marketing cooperatives. Many of these services are provided in conjunction with operating a full service station. However, even when the operation of a full service station is taken into account, farm supply cooperatives are more likely to offer other services such as a mechanic, convenience store, and TBA sales.

Of those locals carrying propane, 52 percent are farm supply cooperatives, 27 percent are mixed farm supply and 21 percent are mixed marketing. Cooperatives selling propane frequently provide furnace and A/C service and repairs. Of all cooperatives selling propane, 36 percent of farm supply, 18 percent of the mixed farm supply, and only 4 percent of mixed marketing cooperatives have furnace and A/C service and repairs.

Farm supply cooperatives are more likely to employ a petroleum specialist (42 percent) than mixed marketing cooperatives (35 percent), or mixed farm supply cooperatives (29 percent).

Size

Smaller cooperatives are more likely to offer services to members than other size cooperatives, including: operating service stations, employing a mechanic, selling TBA products and services, and having furnace and A/C repairs and services (table 12). Super-size cooperatives are more likely to have a petroleum sales specialist and card- or key-activated pumps.

Most cooperatives bundle their services with a service station. For example, more than 70 percent of those cooperatives with a service station offer at least three other services. Depending on the size, only between 10 and 25 percent of those cooperatives without a service station will offer three or more services. However, the super-size cooperatives are more likely to offer these services without a service station (25 percent) compared with 10 percent of the small-size cooperatives.

Furnace and A/C service and repairs are more dependent on whether the cooperative sells propane than operating a service station. Yet, it is interesting to note that more super-size cooperatives sell propane than smaller ones. Nearly 80 percent of these largest cooperatives sell propane, compared with 69 percent of large cooperatives, 62 percent of medium, and 68 percent small. However, significantly more smaller size cooperatives offer heating and A/C services than larger cooperatives. When considering only those cooperatives selling propane, a higher percentage of small-size cooperatives still provide furnace and A/C services (38 percent for small, 35 percent for medium, 21 percent for large, and 25 percent for super-size cooperatives).

Sixty percent of super-size cooperatives have a petroleum sales specialist. The volume of their bulk sales could be expected to justify staffing such a position. Petroleum specialists were employed by 45, 42, and 39 percent of small, medium, and large cooperatives, respectively.

Of the three smaller size categories, smaller cooperatives are more likely to employ a petroleum specialist, even though they generally have smaller sales territories and fewer of them deliver bulk fuel. With the small-size cooperative, bulk petroleum sales account for an average of 36 percent of their total cooperative sales, nearly doubling the next size cooperative. The relatively great importance of bulk sales to these small cooperatives means that having an efficient delivery system could mean the difference between a healthy cooperative and a troubled one.

Regions

Table 12 demonstrates that the percentage of cooperatives providing services to its members varies by region. A higher percent of cooperatives in the northern regions (Western Plains, Northern Plains, and Lake States) provide services. Corn Belt cooperatives typically provide the least.

Operating a service station generally indicates that a cooperative also provides other member services. Only 43 percent of the Corn Belt cooperatives operate a service station. This region also has a higher concentration of larger marketing cooperatives. Petroleum is not a major revenue source for many of them, thus explaining the lower emphasis on petroleum products and services.

While many cooperatives bundle their services in conjunction with a service station, the Lake States and Corn Belt are an exception. Convenience stores and tire trucks are operated almost exclusively in conjunction with a service station for most cooperatives in other regions. However, in the Lake States and Corn Belt, 20 and 30 percent of those cooperatives running a convenience store do not combine that operation with a service station, while 15 and 30 percent have a tire truck without a service station, respectively.

Ninety-one percent of the mechanics employed by cooperatives are in the Northern Plains, Lake States, and Corn Belt regions. Ninety-two percent of the cooperatives providing heating and A/C repair

and services also sell propane. However, 93 percent of those providing this heating and A/C repair and services are in the Western Plains, Northern Plains, Lake States, and Corn Belt. As shown earlier these four regions account for 92 percent of cooperative propane sales.

Competition

Competition, changing markets, and market shares are increasing concerns for cooperatives. Urban business is becoming an important source of petroleum sales to cooperatives as the number of farms continue to decrease and acreage is consolidated in the remaining farms. Cooperatives estimated that they face, on average, 18 competitors in retail and 8 in bulk delivery operations (table 13). However, given the huge number of competitors in some urban areas, these average statistics may be somewhat misleading. The median number of competitors facing cooperatives is three for their retail and two for their bulk operations.

One area of particular concern for many cooperatives is the competition from other cooperatives for the same members. Forty-six percent indicated that they face cooperative competition. This duplication pushes up the investment and the cost of delivering petroleum products to members. For the sake of a more efficient and less costly cooperative petroleum sector, this overlap at all levels of the cooperative system must be reduced.

All cooperative types have similar characteristics regarding competition. As would be expected, the average number of competitors increases with the size of cooperatives, most likely due to multiple locations. For instance, super-size cooperatives average nearly seven locations compared with the small-size cooperatives which average between one and two locations. As larger cooperatives expand into more towns or regions, the number of competitors could easily double or triple. Nearly 70 percent of the small-size cooperatives have five or fewer competitors in the retail market. Among super-size cooperatives only 37 percent have five or fewer competitors.

Regional

Competition also varied between regions (table 14). The average number of retail competitors ranged from 15 in Appalachia to 6 in the Delta region. Cooperatives with bulk delivery average two to five competitors. However, some cooperatives estimated they faced 100 competitors. Despite this large range of competitors for both retail and bulk, more than 75 percent of the cooperatives have less than 10 retail and 5 bulk competitors.

Table 15 shows the regions and how the cooperative perceives the market is moving. The Delta and

Table Is-Average and median number of competitors

	Major oil company		Independent oil company		Other cooperative	
	average	median	average	median	average	median
Retail operation	8.17	2	8.05	1	2.40	0
Bulk delivery operation	2.85	1	3.35	1	2.55	0

Table 14—Average number of competitors facing cooperatives for retail and bulk operations by region

	retail	bulk
	average	
Northwest	14	4
Western Plains	9	4
Northern Plains	7	4
Southern Plains	8	2
Lake States	10	5
Corn Belt	12	5
Delta States	6	2
Appalachia	15	5

Tablets-Percent of cooperatives indicating direction of competition in their market by region

	growing	same	shrinking
		Percent	
Northwest	7.69	76.92	15.38
Western Plains	9.38	59.38	31.25
Northern Plains	7.25	68.91	23.83
Southern Plains	7.69	61.54	30.77
Lake States	10.14	63.51.	26.35
Corn Belt	5.58	58.88	35.53
Delta States	25.00	70.00	5.00
Appalachia	15.38	57.69	26.92

Appalachia regions are showing increasing competition. On the other hand, nearly a third of the cooperatives in the Western Plains, Southern Plains, and Corn Belt stated that the level of competition was declining.

Summary

Petroleum products are important to agricultural production, and cooperatives play a vital role in moving those products from the refining stage to the final consumer. Local cooperatives provide nearly a third of the total farm supplies sales and petroleum is a significant part of the product mix. However, many cooperatives provide more than just gas and diesel to the rural communities. Cooperatives are increasing the kinds of services provided to their communities and often pick up the slack left when non-cooperative businesses close their doors.

Despite the importance cooperatives play in providing fuel and services to members, there are striking differences among the cooperatives themselves. Some only provide bulk deliveries while others offer a full range of services. Petroleum sales and services are essential for cooperatives in some regions of the United States. In other areas, these may not be needed, reflecting the differing nature of agricultural production from one region to another.

The average small farm supply cooperative sells a higher proportion of petroleum products, compared with its larger counterparts. The Midwest regions, which have a higher concentration of larger marketing cooperatives, focus on bulk delivery. Many of those cooperatives also sell ethanol-enhanced gas and premium diesel, again reflecting the nature of their agricultural production. The southern regions rely more on retail traffic than bulk sales. A smaller number of cooperatives sell premium diesel and gasohol. However, cooperatives in the southern regions average a higher volume of the premium diesel and gasohol. Propane sales are concentrated in the northern regions and are not related to the size or type of cooperative.

While most local cooperatives provide some basic services in addition to petroleum sales, cooperatives operating a service station seem to offer the most. Cooperatives often bundle services with service stations. Nearly 75 percent of the cooperatives have a service station. However, they seem to be concentrated with small farm supply cooperatives. Yet, larger marketing cooperatives that concentrate in bulk delivery will employ a petroleum specialist to help coordinate distribution.

Competition varies among the different classifications. The larger cooperatives face two to three times more competitors than smaller cooperatives in the retail sector which probably has more to do with the cooperatives operating more locations. The largest cooperatives also face between four and five more bulk competitors than the smaller size ones. Most cooperatives indicated that the number of competitors is stable. However, of greater concern for cooperatives is the number of cooperatives competing against each other. There needs to be a concerted effort to reduce duplicate facilities and overlapping territories and support more cooperative cooperation.

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