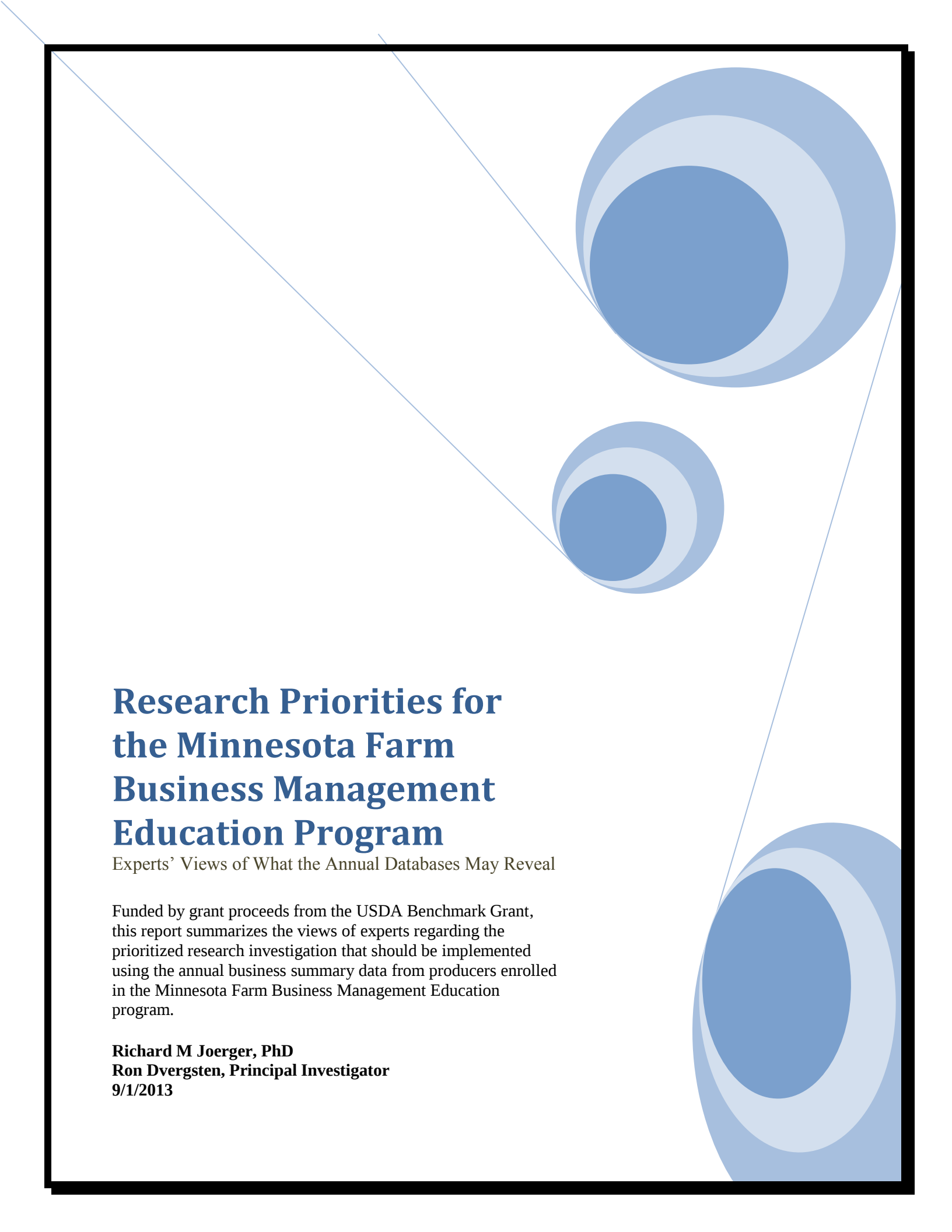


A decorative graphic on the right side of the page features three sets of concentric blue circles of varying sizes. Thin blue lines extend from the top-left and top-right corners towards the circles, creating a sense of movement or focus.

Research Priorities for the Minnesota Farm Business Management Education Program

Experts' Views of What the Annual Databases May Reveal

Funded by grant proceeds from the USDA Benchmark Grant, this report summarizes the views of experts regarding the prioritized research investigation that should be implemented using the annual business summary data from producers enrolled in the Minnesota Farm Business Management Education program.

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Research Priorities for the Minnesota Farm Business Management Education Program: Experts' Views of What the Annual Databases May Reveal

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Introduction

The Minnesota Farm Business Management (FBM) Education Program has existed and provided education for producers for nearly 60 years. Using tailored curricula, the FBM faculty have educated owners and operators of small, medium, and large farms using individualized instructional strategies of how to successfully manage their farms in the calm economic periods as well the current period of high risk, volatility and financial stress. A common set of program objectives guided the instruction, implementation, and analyses of farm operations.

FBM Program Objectives

The mission of the program is to use timely instruction to assist producers in meeting their business and personal goals. Nine program objectives guide the instructional activities of the program . They are: (1) understand the functions of management, (2) establish business and personal goals, (3) keep accurate and complete business records, (4) analyze and interpret business records, (5) apply economic principles to management of the business, (6) improve business organization and efficiency, (7) appreciate effects of decisions on the business, (8) understand human resource management fundamentals, and (9) appreciate the relationship between individual entity and economic, social, political, and physical environments which impact agriculture.

FBM faculty members attend to the objectives as they tailor the individualized and small group instruction for the producers. Since quality business records are the foundation and essential for effective decision making, instructors spend a lot of time teaching proper business accounting procedures and practices. Annual whole farm and enterprise analyses conducted by the FBM instructor are the culmination of year-long business activities and accounting practices

Annual Analyses

The current Minnesota FBM program generates annual business data from over 2100 producers. The net farm income data is annually reported for farmers in the low, medium, and high income groups. The regional deans of management education have worked closely with the Center for Farm Financial Management (CFFM) at the University of Minnesota in developing uniform annual regional and statewide databases. The CFFM aggregates the data from each region and performs whole farm and enterprise analyses. Whole farm, enterprise, financial, and performance analysis data are added to previous analyses to create graphs for multiple years. The data are sorted and used to create many common and customized analyses used to produce reports with quality benchmarking data for each producer. FBM instructors use the personalized as well as ranked group data to further inform and teach producers how to make evidence-based business decisions. Analyses reports for many years are available on the FBM website (URL: fbm.mnscu.edu), however, seldom have the data been used to research questions of interest to the producers and the FBM professionals.

Each year producers, lenders, instructors and media personnel patiently wait for the state and regional reports generated for producers enrolled in the MnSCU farm management education (FBM) program. Not only do the reports double as part of the producer's textbook for the upcoming year, they summarize the financial annual results and the financial health of 1,000s of the commercial producers who farm throughout Minnesota. The careful development of the annual analyses result from tailored and individualized business management education instruction provided by over 50 Minnesota farm business management education instructors. Experiencing the impact of the annual records and analyses data upon the business progress of producers, producers and others alike believe more can be gained by carefully examining the annual databases.

Farm business management instructors, program leaders and administrators, CFFM personnel, researchers, agricultural lenders, educators and producers have perennially pondered and discussed potential factors which contribute to the financial and management differences among farmers in the various profitability groups. Unquestionably, many answers to annual differences have been answered through careful use of known metrics and a suite of annual and enterprise analyses tools (i.e., FINAN, Rankem, FiNBIN, annual analysis reports, annual whole farm financial statements,

enterprise analyses, trend analyses, etc.). Unfortunately, despite the conversations about what could be learned through programmatic analyses of the annual databases, minimal research has been conducted in a programmatic manner. After years of conversation, a small group of program supporters and participants decided to take initial steps which would result in the development of a program of research. Common among the calls for research has been the desire to learn what factors distinguished the most profitable farmers from other categories of farmers. The following section provides one recent example of evidence of the differences among producer groups which warrants learning more about what distinguishes the highly profitable farms.

Rationale for Investigating the Characteristics and Practices of Producers Ranked in the Top 20% of Net Farm Income

Studying the characteristics and practices of the very best performers in a profession is one strategy for learning what others can do to improve their performance, practices and outcomes. Differences among the most profitable crop and livestock farmers from 2008 – 2012 with regard to their income statement, whole business financial efficiency measures and non-farm measures are provided for review. In addition, a comparison of crop acres is provided to illustrate differences among producers with alternate levels of average net farm income. Caution is extended to note that this data is only for 2008-2012, years of some of the most profitable times in American agriculture.

Income Statement Characteristics of the Top 20% of Producers

Farm business management instructors, program leaders, researchers and agricultural lenders familiar with the annual whole farm and enterprise analyses results of top managers have observed that this cohort of producers is, indeed, a unique and talented group of business owners and managers. Top managers do the right things, the right things right, and all the right things at the right time. The FINBIN online analysis program from the Center for Farm Financial Management at the University of Minnesota is used to compare many production and financial measures of producer records maintained for the Minnesota State Colleges and Universities system (MnSCU). An analysis of the annual income statements of MnSCU producer records for 2008-2012 demonstrates the differences in each component of the income statement of producers ranked by their level of net farm income. The data in Table 1 shows the average of all farms in the far right column, and the

breakdown of all the data into 5 equal, 20% categories based on the Net Farm Income. The data suggest the Top 20% of the producers in the Farm Business Management Education program operate within different parameters in managing their operations. This data reveals that proportionately, the Top 20% of producers have gross farm cash sales which are proportionately higher, farm cash expenses lower, net cash farm income higher, inventory change as percentage of net farm income higher, net farm income from operations higher, average net farm income higher, and median net farm income higher. A disproportionate number of crop, livestock or crop and livestock farms make up the higher and lower net farm income operations, respectively.

Table 1
Average of 2008-2012 MnSCU Producer Income Statement Components

Components	Category of Net Farm Income					
	Low 20%	20 - 40%	40 - 60%	60 - 80%	High 20%	All Farms
Number of farms	2288	2290	2286	2291	2285	11440
Crop Farms	n=822 ¹ /36% ²	1040 ¹ /45 ²	1228 ¹ /53 ²	1475 ¹ /64 ²	1668 ¹ /73 ²	6233 ¹ /54 ²
Livestock Farms	730/32	645/28	469/21	310/14	248/11	2402/21
Crop/Lvstk/Dvsfd	736/32	605/26	589/26	506/22	369/16	2805/25
Gross cash farm income (GCFI)	440,097	324,194	493,675	747,959	1,543,145	709,857
% of High 20 Farms	28.5	21.0	32.0	48.5	100	46.0
Total cash farm expense (TCFE)	409,166	270,263	394,579	589,486	1,182,117	569,151
% of High 20 Farms	34.6	22.9	33.4	49.9	100	48.1
TCFE as % of GCFI	93.0	83.4	79.9	78.8	76.6	80.2
Net cash farm income	30,931	53,931	99,097	158,473	361,028	140,705
% of High 20 Farms	8.6	14.9	27.4	43.9	100	39.0
NCFI as % of GCFI	7.0	16.6	20.1	21.2	23.4	19.8
Inventory change	-38,383	6,102	29,519	78,323	269,755	69,076
% of High 20 Farms	-14.2	2.3	10.9	29.0	100	25.6
% of ANFI	119.75	14.72	29.79	40.09	48.96	40.4
Depreciation	-24,736	-18,784	-29,765	-42,681	-83,644	-39,924
% of High 20 Farms	29.6	22.5	35.6	51.0	100	47.7
Net farm income from oprtns	-32,187	41,249	98,851	194,115	547,138	169,857
% of High 20 Farms	-5.9	7.5	18.1	35.5	100	31.0
Gain or loss on capital sales	136	208	248	1,232	3,806	1,126
% of High 20 Farms	3.6	5.5	6.5	32.4	100	29.6
Average net farm income (ANFI)	-32,052	41,456	99,100	195,347	550,945	170,983
% of High 20 Farms	-5.8	7.5	18.0	35.5	100	31.0
Median net farm income	-7,843	40,113	95,441	188,579	429,996	96,905
% of High 20 Farms	-1.8	9.3	22.2	43.9	100	22.5

Note: ¹ Number of producers in the category ² Percentage of the type of farm in the category

Table 2
Farm Financial Standards Council Measures of Performance of MnSCU Producers
With Analyzed Records from 2008-2012

	All Farms	Low 20%	20 - 40%	40 - 60%	60 - 80%	High 20%
Number of farms	11463	2292	2293	2292	2293	2293
Profitability (cost)						
Rate of return on assets	10.70%	-4.10%	4.70%	8.20%	11.70%	16.70%
Rate of return on equity	15.40%	-17.80%	3.80%	11.20%	17.10%	24.20%
Operating profit margin	23.20%	-12.50%	11.90%	19.30%	24.30%	32.40%
Asset turnover rate	46.20%	33.00%	39.20%	42.80%	48.30%	51.70%
Profitability (market)						
Rate of return on assets	9.30%	-0.80%	5.30%	7.70%	10.10%	13.70%
Rate of return on equity	13.80%	-6.60%	6.20%	10.80%	14.90%	21.00%
Operating profit margin	26.30%	-3.10%	19.00%	24.20%	27.40%	33.10%
Asset turnover rate	35.40%	24.60%	28.10%	31.80%	36.80%	41.30%
Liquidity & Repayment (end of year)						
Current assets	523,508	224,802	187,939	330,639	555,277	1,318,667
Current liabilities	249,647	182,749	114,136	176,479	266,321	508,488
Current ratio	2.1	1.23	1.65	1.87	2.08	2.59
Working capital	273,861	42,053	73,803	154,161	288,956	810,180
Working capital to gross inc	35.70%	10.20%	22.40%	29.80%	35.60%	45.80%
Term debt coverage ratio	2.66	-0.04	1.32	1.98	2.84	4.4
Replacement coverage ratio	2.21	-0.03	1.13	1.67	2.32	3.57
Solvency (end of year at cost)						
Total farm assets	1,534,907	879,401	732,977	1,111,617	1,605,449	3,344,619
Total farm liabilities	682,774	543,842	393,791	546,156	702,341	1,227,622
Total assets	1,706,777	1,006,450	865,816	1,269,302	1,793,659	3,598,162
Total liabilities	724,320	579,560	428,733	580,337	743,246	1,289,598
Net worth	982,457	426,891	437,083	688,965	1,050,412	2,308,564
Net worth change	134,065	-39,229	28,813	71,530	150,070	459,038
Farm debt to asset ratio	44%	62%	54%	49%	44%	37%
Total debt to asset ratio	42%	58%	50%	46%	41%	36%
Solvency (end of year at market)						
Total farm assets	1,994,583	1,192,063	1,024,009	1,492,926	2,098,432	4,164,919
Total farm liabilities	886,794	650,691	486,298	690,908	912,100	1,693,784
Total assets	2,196,647	1,345,253	1,180,665	1,678,244	2,319,297	4,459,177
Total liabilities	938,321	693,009	526,690	731,908	965,331	1,774,471
Net worth	1,258,325	652,244	653,975	946,336	1,353,966	2,684,706
Net worth change	155,577	-11,041	50,437	95,228	173,638	469,526
Farm debt to asset ratio	44%	55%	47%	46%	43%	41%
Total debt to asset ratio	43%	52%	45%	44%	42%	40%

Farm Financial Standards Council Business Performance Measures

Monitoring the business's profitability, liquidity, and solvency metrics are critical roles of the business manager and owner. Parameters for various levels of soundness for each metric have been established by the Farm Financial Standards Council and used by producers, educators, researchers, agricultural lenders, and others to monitor each business. Table 2 reflects the average measures for records of producers enrolled in the Minnesota Farm Business Management Education Program from 2008-2012.

Aware that management, and external and business environments continually influence outcomes, the data reveal that the profitability, liquidity, and solvency metrics of the top 20% of the producers are among the very best for all levels of net farm income. The data for 2008-2012 reveal that the top 20% of the crop and livestock producers were characterized by stronger ratios and efficiency measures for profitability, liquidity and solvency than producers with other levels of net farm income. Likewise, the magnitude of their assets, liability, and working capital enabled them to producer larger annual gross sales while keeping expenses to more efficient levels.

Non-Farm Characteristics

The descriptive data for 2008-2012 in Table 3 also illustrates the differences in net nonfarm income of producers with varying amounts of net farm income. Producers with the higher rate of net farm income had the lower amounts of net farm income, and those with the least net farm income had the most net nonfarm income. The data further reveal that total living expenses, investment, and capital purchases increased as net farm income increased.

Crop Acres

The data in Table 3 reveal the relative amount of owned and rented crop and total acres by producers within each category of net farm income earnings. Producers in the High 20% category owned limited acres and rented nearly double the acres of producers in the second category (60-80%) of net farm income. Producers in the top two categories of net farm income, on the average, rented

nearly three times the number of acres owned, lower income farmers rented about twice the number of owned acres.

Table 3
Nonfarm and Cropping Information for Farms with Alternate Levels of Net Farm Income

	All Farms 11463	Low 20% 2292	20 - 40% 2293	40 - 60% 2292	60 - 80% 2293	High 20% 2293
Nonfarm Information						
Net nonfarm income	27,355	34,075	28,752	26,540	24,613	22,798
Farms w/ living expenses	3,031	499	614	677	657	584
Total family living expense	54,803	43,890	44,912	52,466	59,473	71,983
Total liv, invest, cap. purch	84,592	52,645	57,363	74,935	96,610	138,193
Crop Acres						
Total acres owned	263	200	177	222	277	440
Total crop acres	793	426	376	574	887	1,703
Total crop acres owned	224	143	131	188	240	419
Tot. crop acres cash rented	549	275	230	368	620	1,254

Summary

Stakeholders desiring to learn more through research about what makes producers in the High 20% (as well as other categories) of net farm income recognize differences in the income and performance measures of these top producers. With more known through programmatic research of the most profitable and other farmers, they believe such information can be useful for producers at other levels of net farm income for making informed changes in their business structure and practices.

Recommendation that Research of the Annual Databases be Conducted After Prioritization of Research Topics

The Minnesota State Colleges and Universities Office of the Chancellor leaders convened a 25 member Task Force in 2009 and 2010 to provide recommendations concerning strategies of how to ensure a strong future for the FBM Program. (See Minnesota FBM Task Force information at <http://fbmtaskforce.project.mnscu.edu/>). The leaders and selected Task Force members recognized that quality business management education and producer data are foundational to quality business management education programs. Likewise, they believed new instructional materials should be developed that use the research findings from studies conducted using data from the annual

databases.

Neither the participants of the Task Force or the corresponding farm business management subcommittee members were confident in their abilities to create a final list of research questions and topics which should be investigated. Instead, they believed individuals with the proper knowledge and skill should become involved. Given their commitments to the idea of using the databases to improve the instruction in the program, they created a recommendation from the Task Force. Following the initial recommendation of conducting a statewide study of the instructional preferences of all Minnesota producers, the second recommendation of the Task Force was to conduct research of the FBM databases for information to be used to: (1) enhance curricula and instructional materials, and (2) identify other factors that contribute to producer success.

Purpose and Objectives

The purpose of this project was to secure the input of national experts regarding prioritized topics which need investigation using the data created from records of producers enrolled in the program hosted by selected colleges in the Minnesota State Colleges and Universities system. Additionally, the project sought to create an awareness of the literature related to the highest prioritized project. The objectives which guided the project were: 1) establish a prioritized list of research topics, and 2) conduct a cursory literature review to inform the research of the first priority of the program of research.

Methods

Design

The principal investigator considered various options for developing a quality prioritized list of research topics. Recognizing that input from informed researchers, practitioners, program leaders, instructors, who valued research, the PI elected to use the Modified Delphi Technique, a variation of the Delphi Technique (Dalkey and Helmer, 1963), to gather the input of a small group of informed professionals. Hsu and Sanford (2007) summarized the value of the technique by

concluding it is useful for securing current input from individuals who are immersed in the topic of interest.

Designed more to determine what could or what should be (Miller, 2006), the MDT is effective for creating consensus using multiple administrations and iterations of questionnaires to secure the opinions of a small group of selected experts (Dalkey & Helmer, 1963; Dalkey, 1969; Linstone & Turoff, 1975; Martin and Frick, 1998). Ultshak (1983), Turoff and Hiltz, (1996) and Ludwig (1997) agree that Delphi techniques are useful for facilitating group communications, inquiry, and conversations regarding specific topics with desired outcomes of setting goals, suggesting optimal practices and programs, and offering predictions of future events.

Not possible when using single administrations of questionnaires to experts, the MDT enables experts to further reflect upon their judgments, and anonymously and confidentially evaluate the statements in multiple rounds (Dalkey, 1972). In addition to these features, the MDT provides ease in securing opinion from geographically dispersed experts through timely use of email and other online data gathering programs (Hsu and Sanford, 2007).

Participants

The final expert panel was comprised of 15 members of a steering committee, which convened in October 2012, and 16 additional experts nominated by the steering committee. Many of the members of the final list of experts were currently serving in more than one professional capacity thus adding to the desired understanding of the needs for research which would lead to development of instructional materials for the producers. For example, of the 28 experts who responded in round two, three had experience and expertise as lenders, five as extension educators, nine as university faculty members, seven as farmers and ranchers, five as consultants, seven as FBM instructors, one as a policy specialist, five as researchers, and six as program leaders of farm business management education programs.

Instrument for Gathering Opinions of Experts

The initial steering committee of 15 developed a listing of key topics viewed to be useful for instructional materials for producers. See Table 4. After a subcommittee of researchers refined the

Table 4
Research Topics Rated by the Expert Panelists in Each Round

Research Topics	Round 1	Round 2	Round 3
Influence of commodity marketing strategies upon net farm income and other measures.	+	+	
Longitudinal investigations of the financial and production factors which most influence the profitability of selected enterprises of high return farms (i.e., dairy cows, dryland corn, soybeans, etc.).	+	+	+
Longitudinal investigations which analyze selected financial measures and/or factors for alternate cohorts of farmers (i.e., farmers who rent vs. own; dairy farms; farmers who buy varying amounts of feed vs. those who raise their feed, etc.)	+	+	+
Parameters of financial measures which reflect the short and long term financial viability of farm businesses.	+	+	+
Identify key factors which attribute to business success for farmers at different years in their business cycle (e.g., entry, established, transitioning).	+	+	+
Influence of farm type, farm size, debt, age, and other characteristics on selected business outcomes (i.e., net farm income, debt level, and capital investment).	+	+	+
Acceptable and optimal levels of debt (based upon per acre, animal unit, type of farm, profitability level, etc.).	+	+	+
Debt load parameters which influence leasing and buying decisions for beginning and experienced farmers.	+	+	+
Financial measures (i.e., gross sales, % equity, net farm income, standard financial measures, rate of return on assets, etc.) which perennially characterize farmers in selected profitability categories.	+	+	+
Characterize the sources (providers) of financing for capital purchases		+	
Longevity of business activity with various enterprises (e.g., no. of years producing corn, alfalfa, dairy, swine production, etc.)		+	
Stress testing of financial statements		+	+
Explore how financial measures are impacted by selected demographic, educational, and other characteristics of the producers.		+	+
Panel study to identify the parameters of the key financial measures of rapidly growing farm businesses.		+	+
Relationships between key production technologies (i.e., lbs. of milk per stall, row width; feeding systems, pigs per farrowing stall, etc.) and selected financial measures (net farm income, cash income, inventory changes, etc.).		+	+

Relationships between aggressive tax strategies and selected financial measures.	+	+
Mean Influence of risk management strategies (i.e., diversification, pricing, insurance, etc.) upon key financial measures which reflect long and short term viability of the business.		+
Factors which contribute to successful farm transitions.		+
Influence of the adoption of technologies upon profitability.		+

initial list, the steering committee agreed upon nine research topics to be included in the initial round of the three round process. Participants responded to the suitability of listed topics and also provided additional topics in the first and second rounds. Round 1 provided the experts with nine listed topics, Round 2 with 18 topics and Round 3 with 16 listed topics for scoring. The topics for the corresponding rounds are presented in Table 4.

Data Collection, Rating, and Analysis

The initial and subsequent administration of the online questionnaires were delivered using SurveyMonkey, an online data gathering technology. Participants were notified of the arrival of the online questionnaires three to five days in advance. Participants were provided seven days to respond to each round of listed topics. Non-respondents received up to three reminders following the initial deadline.

Experts rated each of the initial and subsequent proposed research topics on a scale of one to seven (1-7) with seven being a *high priority* and one being *no priority* as potential research topics. Experts submitted additional topics for subsequent ratings in the first and second administrations of the developing list of research topics. A mean and standard deviation for the experts' scores were calculated. The researchers arbitrarily decided that research topics with a mean rating score less than 5 were removed from the list after a minimum of two scoring opportunities.

Findings

The primary objective of the Modified Delphi process was to determine the topics with the highest research priority among the panel of experts. Experts rated each research topic two times. The mean score for each item in each round was derived from the average of the ratings of the experts. The

data in Round 3 reflect an average of the priorities of the experts. As noted in Table 2, twelve topics secured a mean score of 5.0 or greater. Six of the nine research topics in round one and three topics submitted in Round 1 and 2 maintained scores of 5.0 or greater to make the final list of research topics. Of note are the topics in Table 3 that did not make the final list of prioritized research topics.

High Priority Research Topics

The expert panel members met and reviewed the findings. They suggested that a number of the topics overlapped and should be placed in a similar category or cluster. The researchers used the suggestions of the panel and reviewed the statements and scores from Round 3. They placed four to seven research topics into two major research clusters.

Cluster One - Financial, Production, Technology and Management

This cluster included research Topic numbers 1, 2, 3, 5, 6, 10, 11, 12. The number one ranking research item ($M=6$ $SD=1.0$) for all three rounds was Topic 1 in Table 2: financial measures which perennially characterize farmers. Likewise, Topic 2 in Table 5 was the second highest prioritized research in all rounds ($M=5.7$ $SD=1.1$). Topic 2, longitudinal investigations of the financial and production factors which most influence profitability, introduced the desire of experts to investigate how profitability was impacted by production and financial factors. Likewise in Topic 5, experts desire to know how selected production categories influence other financial measures of interest. Two of the lower ranking research topics, Topics 11 and 12, were introduced by experts in Round 1 and maintained high priority ratings in the final two rounds. The mean scores reflect that experts, indeed, see the value of knowing more about how financial measures are impacted by producer characteristics (i.e., demographic, educational, etc.) and the parameters of the key financial measures of rapidly growing farm businesses.

Cluster Two - Farm Business Persistence in Alternate Business Conditions

This cluster included research Topics 4, 7, 8, and 9. The experts believe much is to be learned from the databases about the factors which contribute to successful farm transitions ($M=5.7$ $SD=1.3$). Likewise, aware of the use of various risk management tools, the experts desired to know how the tools influence the key financial measures which reflect the short and long term viability of the

business. Introduced as a research topic by an expert in Round 1, the practice of stress testing of financial statements, maintained a strong priority of research in Round 2 ($M=5.6$ $SD=1.3$) and 3 ($M=5.5$ $SD=1.5$). Aware that producers continually desire to know more about the soundness of

Table 5
Expert Panelists Priority Ratings of the Research Topics

Research Topics to be Investigated	<u>Round One</u>			<u>Round Two</u>			<u>Round Three</u>		
	n	M	SD	n	M	SD	n	M	SD
<i>Cluster One - Financial, Production, Technology and Management</i>									
1. Financial measures (i.e., gross sales, % equity, net farm income, standard financial measures, rate of return on assets, etc.) which perennially characterize farmers	30	6.0	1.1	27	6.2	1.0	28	6.0	1.0
2. Longitudinal investigations of the financial and production factors which most influence profitability	30	5.8	1.1	28	5.8	1.1	28	5.7	1.1
3. Influence of risk management strategies upon the key financial measures which reflect long and short term viability of the business							28	5.7	1.1
5. Longitudinal investigations which analyze selected financial measures and/or factors for selected cohorts of farmers (i.e., farmers who rent vs. own; dairy farms; etc.)	30	5.4	1.1	28	5.6	1.2	28	5.5	1.1
6. Stress testing of financial statements.				28	5.6	1.3	28	5.5	1.5
10. Influence of farm type, farm size, debt, age, and other characteristics on selected business outcomes	30	5.3	1.0	28	5.3	1.2	28	5.1	1.2
11. Explore how financial measures are impacted by producer characteristics (demographic, educational, etc.)				28	5.6	0.9	27	5.1	1.3
12. Panel study to identify the parameters of the key financial measures of rapidly growing farm businesses				28	5.6	1.1	27	5.0	1.3
<i>Cluster Two - Farm Business Persistence in Alternate Business Conditions</i>									
4. Factors which contribute to successful farm transitions							28	5.7	1.3
7. Parameters of financial measures which reflect short and long term financial viability of the farm businesses	30	5.7	1.4	28	6.0	1.0	28	5.4	1.4
8. Factors which attribute to business	30	5.6	0.7	27	5.3	1.2	28	5.4	1.2

success for farmers at different stages in their business cycle			
9. Influence of the adoption of technologies upon profitability	28	5.3	1.3

their businesses, Topic 8 – parameters of financial measures which reflect short and long term financial viability of the farm businesses - was of continued higher priority to the expert panelists in all rounds. And lastly, the panelists consistently prioritized Topic 9, factors which attribute to business success for farmers at different stages in their business cycle, in Round 1 (M=5.6 SD= .7), Round 2 (M=5.3 SD 1.2) and Round 3 (M=5.4 SD=1.2).

Lower Priority Research Topics

The data in Table 6 reflect the research topics which were rated by experts that did not secure or maintain a minimum score of five. Topics 1 and 4, which addressed issues related to debt, maintained sufficient priority through Rounds 1 and 2 to be further considered in Round 3. Research Topic 5, influence of commodity marketing strategies upon net farm income and other measures, was of sufficient interest to the steering committee and entire expert panel in Round 1. Investigations of the relationships between key production technologies and selected financial measures, Topic 2, maintained sufficient priority in Round 2. Likewise, investigations between aggressive tax strategies and selected financial measures was of priority in Round 2 but not round three. Topics 6 and 7 were of limited priority and were not advanced for additional scoring by experts.

Table 6
Research Topics with Mean Scores Below 5.0

	<u>Round 1</u>			<u>Round 2</u>			<u>Round 3</u>		
	n	M	SD	n	M	SD	n	M	SD
1. Acceptable and optimal levels of debt (based upon per acre, animal unit, type of farm, profitability level, etc.).	30	5.3	1.4	28	5.1	1.4	28	4.9	1.4
2. Relationships between key production technologies (i.e., lbs. of milk per stall, row width; feeding systems, pigs per farrowing stall, etc.) and selected financial measures (net farm income, cash income, inventory changes, etc.).				28	5.4	1.1	27	4.9	1.3
3. Relationships between aggressive tax strategies and selected financial measures.				28	5.1	1.3	28	4.8	1.4
4. Debt load parameters which influence leasing and buying decisions for beginning and experienced farmers.	30	5.3	1.2	28	5.0	1.5	28	4.7	1.4
5. Influence of commodity marketing strategies upon net farm income and other measures.	30	5.2	1.4	27	4.9	1.4			
6. Characterize the sources (providers) of financing for capital purchases.				28	4.4	1.5			
7. Longevity of business activity with various enterprises (e.g., no. of years producing corn, alfalfa, dairy, swine production, etc.)				28	4.3	1.4			

Summary, Conclusions, and Next Steps

The purpose of this project was to identify and prioritize topics of research that can be answered by researchers using data within the databases of records of producers who enrolled in the Minnesota State Colleges and University System farm business management education program. Findings derived from the eventual research topic(s) studies are intended to be used to develop corresponding farm business management instructional materials.

Summary

A steering committee consisting of fifteen university researchers, extension educators, FBM program leaders, FBM instructors, and consultants was convened in October 2012 with the purposes of learning about the project, to develop an initial list of proposed research topics, and to nominate additional experts. Nine statements were developed for the initial round of the three-round Modified Delphi technique (MDT) and process from the input of the steering committee. A MDT was used to collect data about what research should be done (Miller, 2006) because it allowed input for widely geographic dispersed experts who were afforded ample opportunities to provide controlled feedback in an anonymous and confidential manner using electronic data collection technologies.

Sixteen additional experts accepted the invitation to participate, this a total of thirty experts were a part of the process. The committee of 31 experts subsequently scored the nine statements in Round 1 and added additional research topics. The experts submitted their prioritization scores in Round 2. They, likewise, added additional research topics. In Round 3, experts scored the topics from Round 2 which had a mean score of 5.0 or higher. In addition they twice scored new research topics submitted by experts from Round 2.

Twelve topics secured a mean priority score of 5.0 or higher after Round 3. Expert committee members, principal and project staff categorized the research topics into two major clusters of research topics. Cluster One -Financial, Production, Technology and Management - consisted of factors relating to finance, production, technology, and management which may impact business success as measured by net farm income and other major outcome measures. Cluster Two - Farm Business Persistence in Alternate Business Conditions - included factors which contribute to successful business transitions, key measures which predict business viability, and the impact of stages of business development upon business success. In order from highest mean score (6) to the mean cutoff score of 5.0, the research topics were:

Cluster One - *Financial, Production, Technology and Management*

Financial measures (i.e., gross sales, % equity, net farm income, standard financial measures, rate of return on assets, etc.) which perennially characterize farmers
 Longitudinal investigations of the financial and production factors which most influence profitability
 Influence of risk management strategies upon the key financial measures which reflect long and short term viability of the business
 Longitudinal investigations which analyze selected financial measures and/or factors for selected cohorts of farmers (i.e., farmers who rent vs. own; dairy farms; etc.)
 Stress testing of financial statements.
 Influence of farm type, farm size, debt, age, and other characteristics on selected business outcomes
 Panel study to identify the parameters of the key financial measures of rapidly growing farm businesses

Cluster Two - *Farm Business Persistence in Alternate Business Conditions*

Factors which contribute to successful farm transitions
 Parameters of financial measures which reflect short and long term financial viability of the farm businesses
 Factors which attribute to business success for farmers at different stages in their business cycle
 Influence of the adoption of technologies upon profitability

Conclusions

The experts represented roles and interests of the primary participants of the farm business management education program enterprises from across the United States. They were highly engaged in the process with 90% or more participating in all three rounds of the process. Their responses suggest there is a high priority for investigating selected research topics using the databases developed from financial data derived from the records of producers.

The topics identified by the experts reflected consensus of a large number of experts. Of note, and a limitation of the process and final prioritized topics, is that many of the prioritized topics overlap or may be part of another topic. Researchers who use the information from this study are cautioned, and encouraged to clearly define the parameters of research topics selected from this report.

After reviewing the prioritized topics, and being mindful of the purpose and use of the findings from studies using the annual database information, several conclusions emerged.

First, realizing that producers who perennially earn the highest net farm incomes as the best to being the group to learn about, researchers desire to study their data by conducting panel studies versus single year cross-sectional studies whenever possible. Given the complexities of the business and the factors which influence key outcome measures (i.e., inventory changes, management, consumer demand, market information, production efficiencies, technology efficiencies, etc.), panel studies offer a sound and comprehensive analyses of topics of interest. The initial research priority - financial measures which perennially characterize farmers in selected profitability categories- along with similar research priorities provide a focus for this line of research.

Second, recognizing the complexity of a business, there is considerable interest in investigating an array of influencing factors which impact key financial measures (i.e., net farm income, cash farm income, etc.). More specifically, priority two points to the investigation of financial and production factors which influence key financial measures over time. Topics 5, 10, 11, 12, 9, 10, 11, and 12 each itemize factors which influence key financial outcomes.

Third, volatility in the global and domestic economies requires careful use of proven risk management strategies and tactics. Experts recognize that producers need to be informed of the risk management strategies which have the greatest impact in various financial environments. Much can be gained through investigations of the information in the historic databases to inform current producers about sound risk management tools and strategies.

Fourth, as recognized by the experts in Topic 4 in Table 2, and others (Joerger, Nelson, Werner, Jaber, and Bowen, 2012; Joerger, Bowen, Jaber, Werner, and Nelson, 2012) as being a high priority among producers, farmers and ranchers desire sound information and ideas of how to structure the farm and ranch assets to ensure a successful transition to the next generation of producers. Investigations of the data may be useful in identifying productive and ill-advised practices that benefit and jeopardize success of transition planning.

Fifth, local, regional, state, and national economies are greatly affected by the success or failure of efficient and financially sound farm and ranch businesses. The development of parameters which

can be used to gauge or stress test farm financial conditions can strategically serve producers, community developers, agricultural lenders and suppliers, educators and policy-makers.

Sixth, the impact of technology will continue to accelerate as the global economy becomes more entwined among nations. In addition to the financial and production metrics, human resource, environmental and other measures that make up their business scorecard, producers need to calculate scores on the nature (limited to very advanced), use (limited to highly used) and effectiveness (low contributions to advanced contributions to profitability) of all technologies. Data derived about the technologies used by the most profitable farms can result in tools which can be used for other producers to assess, optimize, and strategically use their technologies.

Seventh, benchmarking business performance at different stages of the career business cycle with producers with similar characteristics can be very informative. Experts in this study agree that research needs to be conducted which can provide metrics for different stages of the business cycle of producers.

And finally, recall that the purpose of this project was to secure the input of national experts regarding prioritized topics which need investigation using the data created from records of producers enrolled in the program hosted by selected colleges in the Minnesota State Colleges and Universities system. Knowledge about the characteristics, practices, and manager characteristics of the producers who perennially have been in the top 20% of net farm income earners is of special interest to the members of the expert panel (e.g., farmers, researchers, agricultural lenders, farm business management instructors, extension educators, other adult agricultural educators, and program leaders and administrators).

After considerable study, conversation, and reflection, the project team acknowledges the listing of prioritized research topics provides a basis for securing resources to initiate a programmatic research plan for use of the data within the databases created from the producer records of students enrolled in the Minnesota Farm Business Management Education Program. Too, we recognize that it is solely a beginning of framework for a systematic plan of research which will impact the development of instructional materials for producers.

Next Steps

The second part of this project is to complete a review of literature for the initial research topic. Noting the clustering of the topics into two major categories with up to eight topics each, the cursory literature review will introduce research studies conducted since 2000 which address prioritized topics.

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