Potential Use of Gross Revenue Insurance on Beef Farms in Southeast Kansas

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This study examines the effectiveness of a relatively new whole-farm revenue insurance product, Adjusted Gross Revenue-Lite (AGR-Lite), on net farm income risk for 49 southeast Kansas beef farms using farm-level data. AGR-Lite is whole-farm revenue insurance, which provides protection against low revenue resulting from natural disasters causing production losses and commodity market fluctuations that affect revenue. AGR-Lite may be used as a stand-alone product or as an umbrella (wraparound) policy allowing producers to use AGR-Lite in conjunction with alternative insurance policies.

The effect of participation in AGR-Lite on net farm income (NFI) variability is evaluated for a group of 49 southeast Kansas beef farms. Kansas Farm Management Association (KFMA) data are used to compile 18 years (1993–2010) of continuous farm-level data, which is then used to evaluate participation in AGR-Lite. Each of these farms obtained more than 50% of their average total income from beef production during the 18 years.

AGR-Lite is the first Federal Crop Insurance Corporation (FCIC) program to provide coverage for crops, animals, and other previously uninsurable commodities under one product by insuring whole-farm revenue. Producers must file an intended agricultural commodity report, to be submitted at the beginning of each eligible insurance year detailing the commodity, expected acreage, yield, expected value, and total value. Qualifying farms must also submit a minimum of five years of continuous, verifiable tax records for the same entity, preferably Schedule F 1040 filings or equivalent tax forms to document historical revenue and expenses and, before January 31 of the insurance year (March 15 for new applications), must file beginning inventory for that insurance year, including crops in storage and accounts payable and receivable.

The revenue guarantee is determined using an approved adjusted gross revenue, which is based on the lesser of the five-year average or an indexed adjusted gross revenue (to account for farm expansion or contraction overtime) from tax returns or the expected farm income for the current insurance year. Expected farm income is derived from the intended agricultural commodity report. The revenue guarantee level, or loss-inception point, is equal to the approved adjusted gross revenue multiplied by the selected coverage level. When a producer realizes a shortfall in gross revenue below the revenue guarantee level, an indemnity is paid on the difference based on the payment rate percentage the farm manager selected.

The AGR-Lite program is complex and thus requires very detailed data from the insured. This complexity may be at least part of the reason that relatively few policies have been sold in Kansas or nationally despite the potential benefit of insuring against production risks and basis risks, which are not mitigated by other insurance products for livestock that only cover price risk.

To determine an overall net gain or loss from AGR-Lite, consideration must be given to the cost of the policy or premium. We evaluate AGR-Lite as a stand-alone product rather than a "wraparound" policy. Anonymous annual data for the period 1993–2010 from the KFMA were used to reproduce the essential information for IRS Form 1040, Schedule F and inventory records that a farm manager would need to purchase AGR-Lite. Five years of preceding historical data are required to perform the necessary calculations for the revenue guarantee and to purchase AGR-Lite each year. The data set allowed calculation of the impact of the whole-farm revenue insurance for the 12 years from 1999–2010. Furthermore, we assume annual enrollment each year over the entire study period.

The average premium rate is calculated by dividing total indemnities by total liabilities for all farms receiving at least one indemnity during the 12-year period and is equal to 2.62%. The loss ratio for this group of farms is 1.0. The loss ratio is the total indemnity payments divided by total premiums for the 12-year period. This calculated percentage rate is then applied to each farm's liability each year to determine the dollar amount of the premium charged in the study. Government subsidization, administrative fees, and catastrophic rate loading are not considered in the premium.

AGR-Lite is examined for its risk reduction potential using net farm income distributions based on the 12 years of data, 1999–2010. Net farm income distributions for each farm during this period were calculated for two strategies: either the farm manager insured with a 75% coverage level and 90% payment rate, or did not insure each year using AGR-Lite as a stand-alone product. The net farm income distributions are then compared.

Fifteen of the 49 farms do not receive a single indemnity payment (Table 1). Fifteen farms receive one indemnity payment, whereas the remaining farms receive two to five payments during the 12-year analysis period. The average annual premium is $4,090 per farm with a range of $398–$17,473 per farm. Participation in AGR-Lite raises the NFI of 16 of the 34 farms receiving at least one indemnity payment and reduces the variability of net farm income as measured by the standard deviation on 27 of these 34 farms. It raises the minimum net farm income of 23 of the 34 farms. These results show that AGR-Lite can reduce net farm income variability of some farms in the study. Further, Stochastic Efficiency with Respect to a Function analysis, which considers all individual net farm incomes in the net farm income distributions with and without the insurance,

indicated that 37% of the farm managers would prefer AGR-Lite if they were risk averse. These results indicate that from a purely economic standpoint, the policy may have tangible benefits for some beef producers if the historical data is reflective of the future.

Despite AGR-Lite being touted as easy to understand, as a result of its design, we find it is complex, which may partially explain the relatively small use of the policy by producers. Proponents contend that given the use of IRS Form 1040, Schedule F, minimal additional recordkeeping is required. However, thorough records including accrual-based accounting of inventories, accounts receivables, prepaid expenses, and accounts payable in addition to a cash-based Schedule F must be maintained for filing purposes.

The findings of this study indicate that risk reduction occurs on many of the beef farms evaluated. However, managers must consider that factors that lead to increased variability in NFI such as costs, but not gross income (which the policy covers) ultimately limit the effectiveness of AGR-Lite as a risk management tool.

Table 1. Summary by Frequency of Claim for 49 Southeast Kansas Beef Farms

Years with Indemnity	Number of Farms	Average Premium Paid[a]	Average Liability[b]	Average Indemnity/Farm/Year[c]
0	15	$4,409	$168,486	$0
1	15	$5,247	$200,518	$26,208
2	11	$3,239	$123,759	$27,932
3	4	$2,663	$101,757	$22,183
4	1	$3,457	$132,121	$22,419
5[d]	3	$1,934	$73,913	$16,498

[a]Average premium paid by farm for each frequency of indemnity group based on a premium rate of 2.62% for all farms.

[b]Average liability was computed by averaging the liability across farms for each frequency of claim.

[c]Average indemnity per farm per year was calculated using the following formula: ([sum of indemnities]/[number of farms]/years with indemnity).

[d]No farms had more than five years with indemnity payments. Each farm was evaluated during a span of 12 years.

Table 2. Net Farm Income Characteristics without and with AGR-Lite

Farm	Number of Indemnities	Average NFI without	Average NFI with	Standard Deviation NFI without	Standard Deviation NFI with	Minimum NFI without	Minimum NFI with
Average		$64,453	$63,104	$65,037	$64,253	–$38,500	–$35,975
1	0	$80,892	$76,941	$104,996	$104,570	–$40,833	–$46,899
9	0	–$3,641	–$4,903	$28,175	$28,116	–$48,669	–$49,523
10	0	$240,114	$226,039	$192,152	$191,926	–$108,140	–$120,304
11	0	$12,977	$11,383	$21,837	$21,872	–$12,231	–$14,142
12	0	$54,918	$53,304	$60,909	$60,880	–$24,162	–$25,901
15	0	$118,674	$110,747	$160,869	$160,061	–$114,616	–$124,721
16	0	$38,582	$37,921	$34,779	$34,498	–$5,680	–$6,087
19	0	$285,678	$273,261	$156,728	$154,226	–$84,145	–$96,258
24	0	$2,900	$1,826	$12,757	$12,803	–$16,935	–$18,063
32	0	$29,102	$21,778	$86,347	$86,517	–$104,895	–$111,902
33	0	$242,379	$235,374	$159,229	$158,117	$59,612	$49,713
36	0	$35,459	$33,683	$16,355	$16,476	$13,590	$11,637
41	0	$34,365	$32,989	$9,190	$9,273	$18,494	$16,911
44	0	$47,321	$45,293	$25,013	$24,941	$8,884	$6,906
48	0	$13,278	$11,225	$39,312	$39,574	–$62,629	–$65,610
2	1	$82,108	$85,764	$81,174	$88,954	–$79,243	–$85,551
4	1	$171,369	$163,820	$197,479	$192,283	–$215,882	–$199,746
5	1	–$6,467	–$9,308	$70,435	$70,229	–$115,118	–$115,348
6	1	$194,946	$190,183	$106,887	$105,500	$23,629	$23,080
14	1	$7,385	$7,074	$31,638	$30,966	–$37,712	–$33,289
17	1	$135,455	$128,048	$90,858	$90,657	$548	–$5,927
22	1	$42,981	$42,737	$20,199	$18,501	$11,309	$14,493
25	1	$132,278	$115,806	$121,545	$121,311	–$73,742	–$92,127
27	1	$106,750	$105,362	$77,770	$64,826	–$76,207	–$16,056
34	1	$141,091	$136,815	$134,224	$131,396	–$7,699	$6,240
35	1	$31,235	$29,303	$82,490	$80,180	–$77,990	–$62,698
39	1	$65,789	$64,808	$23,745	$23,924	$31,793	$28,486
40	1	$21,456	$21,822	$10,768	$8,762	$798	$12,358
43	1	–$376	–$697	$16,441	$15,152	–$30,093	–$27,826
45	1	$104,485	$102,998	$76,328	$71,638	–$10,055	–$15,222

Table 2. Net Farm Income Characteristics without and with AGR-Lite (continued)

Farm	Number of Indemnities	Average NFI without	Average NFI with	Standard Deviation NFI without	Standard Deviation NFI with	Minimum NFI without	Minimum NFI with
8	2	$21,289	$20,274	$33,689	$32,244	–$31,596	–$27,916
18	2	$115,777	$112,975	$139,432	$138,368	–$45,336	–$44,701
23	2	$56,563	$55,086	$38,041	$36,570	$14,259	$11,180
26	2	$15,790	$14,532	$22,685	$20,888	–$25,723	–$17,105
28	2	$69,847	$75,883	$219,586	$224,443	–$192,646	–$204,543
29	2	$66,265	$70,082	$58,880	$51,914	–$77,517	–$72,359
30	2	$24,923	$24,462	$34,817	$33,486	–$32,899	–$29,030
31	2	$59,459	$61,570	$71,981	$65,486	–$27,620	–$20,080
37	2	$11,930	$12,112	$6,127	$6,071	$2,792	$2,161
42	2	$22,535	$25,477	$13,282	$11,202	$2,996	$5,799
47	2	$32,435	$39,943	$42,171	$48,488	–$64,214	–$67,320
7	3	–$6,224	–$6,015	$11,963	$11,324	–$25,367	–$22,009
20	3	–$10,535	–$8,511	$14,673	$10,978	–$36,157	–$23,132
38	3	$144,957	$149,649	$56,073	$70,436	$59,387	$69,470
46	3	–$10,670	–$6,064	$81,920	$80,997	–$128,164	–$98,583
3	4	$44,375	$48,390	$28,702	$28,933	–$1,845	$3,257
13	5	$6,190	$8,368	$5,338	$7,277	–$1,633	–$301
21	5	$9,751	$20,908	$29,728	$26,317	–$59,388	–$28,259
49	5	$20,072	$21,556	$27,094	$24,865	–$37,834	–$35,924

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