Staff Report No. 2019-04 **January 2019**

Cotton, Corn and Soybean Net Return Comparison Decision Aid

A Farm Planning/Decision Tool for Louisiana Growers

Michael A. Deliberto and Brian M. Hilbun
Louisiana State University Agricultural Center
Department of Agricultural Economics & Agribusiness

The Cotton, Corn and Soybean Net Return Comparison Decision Aid is a spreadsheet-based decision tool developed to assist row crop producers in Louisiana in making production decisions based on expected net return comparisons between production of cotton, corn and soybeans, using alternative expectations related to variable production costs, expected crop yields and expected crop market prices. The decision tool contains five Excel worksheets which compares net returns above variable production costs for three alternative sets of crop production choices: (1) cotton versus corn, (2) cotton versus soybeans, and (3) corn versus soybeans.

Net returns above variable production costs are the appropriate values to use in making production decision comparisons among crops in the short run period of one crop year. For a given crop production year, fixed production expenses, including primarily equipment depreciation and interest, would not change as a result of which crops are produced in that year. Variable production costs are defined as those production expenses which would change based upon which crops are planted for production in that year. Land rent, if applicable, would also be included as a production cost in the net return calculation, due to the fact the many of the cropland leases are on a crop share basis and would change in value based upon the level of crop yield and market price. Therefore, net returns above variable production costs and land rent charges are calculated and the differences between these values gives an estimate of the net return advantage of one crop over the other at assumed levels of cost, yield and price.

Information required to be entered by the user for each crop includes: (a) variable production cost per acre, (b) expected crop yield per acre, and (c) crop share rent percentage or cash rent payment per acre. Data values which can be entered/changed by the user are in blue text. In addition, the user can change the range of cotton prices, cotton yields, corn prices and soybean prices evaluated by changing the first value (highlighted in blue) listed for each crop in the worksheet. The worksheet calculates net returns above variable costs and land rent for each crop and shows the difference between the two net returns in the table. Therefore, the values shown in the table can be interpreted as the advantage in net returns per acre for one crop (whose market prices are listed along the left side of the table) compared to the other crop (whose market prices are listed along the top of the table. For the range of market price combinations for which the crop on the left has a net return advantage over the other crop, those cell values with positive net return differences will be shaded in yellow. As values for variable cost, yield and rent are changed, the corresponding net return differences and highlighted cells with a net return advantage will change accordingly.

Worksheet 1 – Cotton versus Corn Net Return Comparison - 1

Cotton Net Return Advantage Compared to Corn Net Returns

			Corn Price =	$3.85	per bushel
Cotton Variable Costs =	$500	per acre	Corn Variable Costs =	$430	per acre
			Corn Expected Yield =	160	bushels per acre
Cotton Share Rent =	20%	crop share	Corn Share Rent =	20%	crop share
Cotton Cash Rent =	$0	per acre	Corn Cash Rent =	$0	per acre

Cotton Yield (lbs/acre)

Cotton Price ($/lb)	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300
$0.55	-167	-145	-123	-101	-79	-57	-35	-13	$9
$0.57	-152	-130	-107	-84	-61	-38	-16	$7	$30
$0.59	-138	-114	-91	-67	-44	-20	$4	$27	$51
$0.61	-124	-99	-75	-50	-26	-2	$23	$47	$72
$0.63	-109	-84	-59	-34	-8	$17	$42	$67	$92
$0.65	-95	-69	-43	-17	$9	$35	$61	$87	$113
$0.67	-80	-54	-27	$0	$27	$54	$80	$107	$134
$0.69	-66	-38	-11	$17	$44	$72	$100	$127	$155
$0.71	-52	-23	$5	$34	$62	$90	$119	$147	$176
$0.73	-37	-8	$21	$50	$80	$109	$138	$167	$196
$0.75	-23	$7	$37	$67	$97	$127	$157	$187	$217
$0.77	-8	$22	$53	$84	$115	$146	$176	$207	$238
$0.79	$6	$38	$69	$101	$132	$164	$196	$227	$259
$0.81	$20	$53	$85	$118	$150	$182	$215	$247	$280
$0.83	$35	$68	$101	$134	$168	$201	$234	$267	$300
$0.85	$49	$83	$117	$151	$185	$219	$253	$287	$321

Values in table equal to cotton net returns minus corn net returns above variable costs

Data to be Entered:

Cell F8	Cotton variable cost, in dollars per acre
Cell F10	Cotton share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell F11	Cotton cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell L7	Corn price, in dollars per bushel
Cell L8	Corn variable cost, in dollars per acre
Cell L9	Corn expected yield, in bushels per acre
Cell L10	Corn share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell L11	Corn cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell D18	Minimum range of cotton price, in dollars per pound of lint
Cell E17	Minimum range of cotton yield, in pounds of lint per acre

Worksheet 2 – Cotton versus Corn Net Return Comparison - 2

Cotton Net Return Advantage Compared to Corn Net Returns

Cotton Variable Costs =	$500	per acre	Corn Variable Costs =	$430	per acre
Cotton Expected Yield =	1,050	pounds per acre	Corn Expected Yield =	160	bushels per acre
Cotton Share Rent =	20%	crop share	Corn Share Rent =	20%	crop share
Cotton Cash Rent =	$0	per acre	Corn Cash Rent =	$0	per acre

Cotton Price ($/lb)	Corn Price ($/bu)								
	$3.00	$3.25	$3.50	$3.75	$4.00	$4.25	$4.50	$4.75	$5.00
$0.55	$8	-24	-56	-88	-120	-152	-184	-216	-248
$0.57	$25	-7	-39	-71	-103	-135	-167	-199	-231
$0.59	$42	$10	-22	-54	-86	-118	-150	-182	-214
$0.61	$58	$26	-6	-38	-70	-102	-134	-166	-198
$0.63	$75	$43	$11	-21	-53	-85	-117	-149	-181
$0.65	$92	$60	$28	-4	-36	-68	-100	-132	-164
$0.67	$109	$77	$45	$13	-19	-51	-83	-115	-147
$0.69	$126	$94	$62	$30	-2	-34	-66	-98	-130
$0.71	$142	$110	$78	$46	$14	-18	-50	-82	-114
$0.73	$159	$127	$95	$63	$31	-1	-33	-65	-97
$0.75	$176	$144	$112	$80	$48	$16	-16	-48	-80
$0.77	$193	$161	$129	$97	$65	$33	$1	-31	-63
$0.79	$210	$178	$146	$114	$82	$50	$18	-14	-46
$0.81	$226	$194	$162	$130	$98	$66	$34	$2	-30
$0.83	$243	$211	$179	$147	$115	$83	$51	$19	-13
$0.85	$260	$228	$196	$164	$132	$100	$68	$36	$4

Values in table equal to cotton net returns minus corn net returns above variable costs

Data to be Entered:

Cell F8	Cotton variable cost, in dollars per acre
Cell F9	Cotton expected yield, in pounds of lint per acre
Cell F10	Cotton share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell F11	Cotton cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell L8	Corn variable cost, in dollars per acre
Cell L9	Corn expected yield, in bushels per acre
Cell L10	Corn share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell L11	Corn cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell D18	Minimum range of cotton price, in dollars per pound of lint
Cell E17	Minimum range of corn price, in dollars per bushel

Worksheet 3 – Cotton versus Soybean Net Return Comparison - 1

Cotton Net Return Advantage Compared to Soybean Net Returns

			Soybean Price =	$8.90	per bushel
Cotton Variable Costs =	$500	per acre	Soybean Variable Costs =	$365	per acre
			Soybean Expected Yield =	50	bushels per acre
Cotton Share Rent =	20%	crop share	Soybean Share Rent =	20%	crop share
Cotton Cash Rent =	$0	per acre	Soybean Cash Rent =	$0	per acre

Cotton Yield (lbs/acre)

Cotton Price ($/lb)	900	950	1,000	1,050	1,100	1,150	1,200	1,250	1,300
$0.55	-95	-73	-51	-29	-7	$15	$37	$59	$81
$0.57	-81	-58	-35	-12	$11	$33	$56	$79	$102
$0.59	-66	-43	-19	$5	$28	$52	$75	$99	$123
$0.61	-52	-27	-3	$21	$46	$70	$95	$119	$143
$0.63	-37	-12	$13	$38	$63	$89	$114	$139	$164
$0.65	-23	$3	$29	$55	$81	$107	$133	$159	$185
$0.67	-9	$18	$45	$72	$99	$125	$152	$179	$206
$0.69	$6	$33	$61	$89	$116	$144	$171	$199	$227
$0.71	$20	$49	$77	$105	$134	$162	$191	$219	$247
$0.73	$35	$64	$93	$122	$151	$181	$210	$239	$268
$0.75	$49	$79	$109	$139	$169	$199	$229	$259	$289
$0.77	$63	$94	$125	$156	$187	$217	$248	$279	$310
$0.79	$78	$109	$141	$173	$204	$236	$267	$299	$331
$0.81	$92	$125	$157	$189	$222	$254	$287	$319	$351
$0.83	$107	$140	$173	$206	$239	$273	$306	$339	$372
$0.85	$121	$155	$189	$223	$257	$291	$325	$359	$393

Values in table equal to cotton net returns minus soybean net returns above variable costs

Data to be Entered:

Cell F8	Cotton variable cost, in dollars per acre
Cell F10	Cotton share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell F11	Cotton cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell L7	Soybean price, in dollars per bushel
Cell L8	Soybean variable cost, in dollars per acre
Cell L9	Soybean expected yield, in bushels per acre
Cell L10	Soybean share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell L11	Soybean cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell D18	Minimum range of cotton price, in dollars per pound of lint
Cell E17	Minimum range of cotton yield, in pounds of lint per acre

Worksheet 4 – Cotton versus Soybean Net Return Comparison - 2

Cotton Net Return Advantage Compared to Soybean Net Returns

Cotton Variable Costs =	$500	per acre	Soybean Variable Costs =	$365	per acre
Cotton Expected Yield =	1,050	pounds per acre	Soybean Expected Yield =	50	bushels per acre
Cotton Share Rent =	20%	crop share	Soybean Share Rent =	20%	crop share
Cotton Cash Rent =	$0	per acre	Soybean Cash Rent =	$0	per acre

Soybean Price ($/bu)

Cotton Price ($/lb)	$8.75	$9.00	$9.25	$9.50	$9.75	$10.00	$10.25	$10.50	$10.75
$0.55	-23	-33	-43	-53	-63	-73	-83	-93	-103
$0.57	-6	-16	-26	-36	-46	-56	-66	-76	-86
$0.59	$11	$1	-9	-19	-29	-39	-49	-59	-69
$0.61	$27	$17	$7	-3	-13	-23	-33	-43	-53
$0.63	$44	$34	$24	$14	$4	-6	-16	-26	-36
$0.65	$61	$51	$41	$31	$21	$11	$1	-9	-19
$0.67	$78	$68	$58	$48	$38	$28	$18	$8	-2
$0.69	$95	$85	$75	$65	$55	$45	$35	$25	$15
$0.71	$111	$101	$91	$81	$71	$61	$51	$41	$31
$0.73	$128	$118	$108	$98	$88	$78	$68	$58	$48
$0.75	$145	$135	$125	$115	$105	$95	$85	$75	$65
$0.77	$162	$152	$142	$132	$122	$112	$102	$92	$82
$0.79	$179	$169	$159	$149	$139	$129	$119	$109	$99
$0.81	$195	$185	$175	$165	$155	$145	$135	$125	$115
$0.83	$212	$202	$192	$182	$172	$162	$152	$142	$132
$0.85	$229	$219	$209	$199	$189	$179	$169	$159	$149

Values in table equal to cotton net returns minus soybean net returns above variable costs

Data to be Entered:

Cell F8	Cotton variable cost, in dollars per acre
Cell F9	Cotton expected yield, in pounds of lint per acre
Cell F10	Cotton share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell F11	Cotton cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell L8	Soybean variable cost, in dollars per acre
Cell L9	Soybean expected yield, in bushels per acre
Cell L10	Soybean share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell L11	Soybean cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell D18	Minimum range of cotton price, in dollars per pound of lint
Cell E17	Minimum range of soybean price, in dollars per bushel

Worksheet 5 – Corn versus Soybean Net Return Comparison

Corn Net Return Advantage Compared to Soybean Net Returns

Corn Variable Costs =	$430	per acre	Soybean Variable Costs =	$365	per acre
Corn Expected Yield =	160	bushels per acre	Soybean Expected Yield =	50	bushels per acre
Corn Share Rent =	20%	crop share	Soybean Share Rent =	20%	crop share
Corn Cash Rent =	$0	per acre	Soybean Cash Rent =	$0	per acre

Corn Price ($/bu)	Soybean Price ($/bu)								
	$8.75	$9.00	$9.25	$9.50	$9.75	$10.00	$10.25	$10.50	$10.75
$3.00	-31	-41	-51	-61	-71	-81	-91	-101	-111
$3.25	$1	-9	-19	-29	-39	-49	-59	-69	-79
$3.50	$33	$23	$13	$3	-7	-17	-27	-37	-47
$3.75	$65	$55	$45	$35	$25	$15	$5	-5	-15
$4.00	$97	$87	$77	$67	$57	$47	$37	$27	$17
$4.25	$129	$119	$109	$99	$89	$79	$69	$59	$49
$4.50	$161	$151	$141	$131	$121	$111	$101	$91	$81
$4.75	$193	$183	$173	$163	$153	$143	$133	$123	$113
$5.00	$225	$215	$205	$195	$185	$175	$165	$155	$145
$5.25	$257	$247	$237	$227	$217	$207	$197	$187	$177
$5.50	$289	$279	$269	$259	$249	$239	$229	$219	$209
$5.75	$321	$311	$301	$291	$281	$271	$261	$251	$241
$6.00	$353	$343	$333	$323	$313	$303	$293	$283	$273
$6.25	$385	$375	$365	$355	$345	$335	$325	$315	$305
$6.50	$417	$407	$397	$387	$377	$367	$357	$347	$337
$6.75	$449	$439	$429	$419	$409	$399	$389	$379	$369

Values in table equal to corn net returns minus soybean net returns above variable costs

Data to be Entered:

Cell F8	Corn variable cost, in dollars per acre
Cell F9	Corn expected yield, in pounds of lint per acre
Cell F10	Corn share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell F11	Corn cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell L8	Soybean variable cost, in dollars per acre
Cell L9	Soybean expected yield, in bushels per acre
Cell L10	Soybean share rent, in percent of crop share (if owned or cash rented, enter zero)
Cell L11	Soybean cash rent, in dollars per acre (if owned or share rented, enter zero)
Cell D18	Minimum range of corn price, in dollars per bushel
Cell E17	Minimum range of soybean price, in dollars per bushel

Michael A. Deliberto can be contacted in the Department of Agricultural Economics and Agribusiness at (225) 578-7267 or by emailing mdeliberto@agcenter.lsu.edu.