INTRODUCTION

This workbook summarizes and compares rice production costs between UC Cooperative Extension's (UCCE) 2015 Sample Costs to Produce Rice and 2015 costs from a tenant of the Natomas Basin Conservancy (NBC). Tenant costs from 2014 are also included. Negative numbers are presented in parenthesis. This workbook contains the following worksheets:

1. Sheet 1 (this sheet) provides an introduction, executive summary of observations, and key conclusions.

2. Sheet 2, Summary Comparison, summarizes the cost comparison between the UCCE sample costs and an NBC tenant.

3. Sheet 3, Tenant Costs, displays example costs provided by one tenant for crop year 2015. A second tenant reviewed the expenses and agreed they were very similar to his expenses for the same time period. No additional details were provided. Tenant costs from 2014 are also included. In 2014 and 2015, the Natomas Central Mutual Water Company (NCMWC) engaged in water sales and the proceeds of the sales reduced the cost of water to shareholders during that year. Accordingly, the tenant-reported water costs were not representative of the normal-year cost of water, due to the distribution of these proceeds. To support the comparison with the UCCE study, the tenant water costs were normalized to the published water tariffs.

4. Sheet 4, UCCE Costs, is a summary of the UCCE sample costs to produce medium grain rice in the Sacramento Valley. The sample costs were developed as a guide for rice growers and are intended to inform production decisions and potential returns. Costs are presented as operating costs, cash overhead, and non-cash overhead. Costs are estimated assuming 1.25% of the producing acres are owned and 98.75% are rented.

The UCCE sample costs estimate $150/acre for water. This sample cost is based on anecdotal information provided verbally by approximately 10 rice growers at a meeting in Yuba City. The $150/acre estimate assumes that some growers supplement canal/district water with groundwater, which is more expensive than surface water. Inquiries to water districts identified the following surface water rates for rice: Western Canal Water District: $21/acre; Richvale Irrigation District: $50/acre; Reclamation District 108: $75.46/acre; Glenn-Colusa Irrigation District (GCID): $83.65/acre; Sutter Mutual: $126.50/acre; and Natomas Mutual Water Company: $139.13/acre. Based on these inquiries, the UCCE sample cost of $150/acre is high relative to surface water costs for rice in the Sacramento Valley. For this comparison, the sample cost for water in the Sacramento Valley was adjusted to $83.65/acre, which is the GCID's published tariff (GCID delivers water to the greatest number of rice growers in the Sacramento Valley).

5. Sheet 5, Detailed Comparison, compares the tenant costs and the UCCE sample costs. The comparison focuses on 2015 because the UCCE sample costs are based on 2015 labor, materials, equipment, etc. Tenant costs from 2014 are also included. Line items correspond to line items provided by the tenant. The line items provided by the tenant are much broader than the line items described in the UCCE sample costs. The notes column describes which line items from the UCCE sample costs are allocated to the line items identified by the tenant. The notes column also includes notes to explain cost differences. All costs are shown on a per acre basis.

6. Sheet 6, Adjusted Comparison, compares the tenant costs and the UCCE sample costs, but excludes direct land ownership costs and insurance costs. The UCCE production costs identify several direct costs (i.e., land, property insurance, and property taxes) associated with land ownership. These direct costs do not apply to the NBC tenant. Accordingly, the direct land ownership costs were excluded. In addition, the category for insurance costs was excluded because there was not enough information to determine whether the tenant costs included the insurance and professional items identified in the UCCE sample costs. Thus, two cost comparisons are presented: one with the direct land ownership and insurance costs (Sheet 5) and one adjusted comparison without direct land ownership and insurance costs (Sheet 6).

EXECUTIVE SUMMARY

Comparison of Rice Production Costs

After adjusting for water, direct land ownership and insurance costs, the UCCE sample costs are $0.57/cwt greater than 2015 tenant costs and $0.77/cwt greater than 2014 tenant costs. These differences are likely due to different cultural practices than those identified in the UCCE sample costs. On a line-by-line basis, the following was observed (see Sheet 6 for additional details):

1. **Rent** represents the largest difference between the 2015 tenant expenses and the UCCE sample costs ($130/acre greater than tenant). The UCCE sample cost for rent is based on anecdotal information provided verbally by approximately 10 rice growers from Colusa, Sutter, Butte, and Yuba counties. The UCCE sample cost for rent in these counties is $425/acre, based on an estimated range of $350-$500/acre and a selling price of $20.70/cwt. It is not clear whether the verbal estimates pertained to the 2014 season or the 2015 season. This compares with the UCCE sample cost of $280/acre in 2012, which assumed a selling price of $17/cwt.

   The UCCE sample costs for rent did not include any information from growers in Sacramento, Placer, or Yolo counties. Rice rents in these counties are typically lower than areas farther north in the Sacramento Valley because the northern areas have more growing degree days (fewer cool days), and fewer cold nights, constituting a more productive and less risky growing environment. Queries to rice growers in Sacramento, Placer, and Yolo counties indicate a rental range of $150-$315/acre. In the NBC, the first rent payment is $190/acre. There also is a second rent payment depending on rice prices

and yield. In 2014, the NBC received an average of $352/acre, and in 2015, the NBC received an average of $293/acre. Thus, the rents cited in the UCCE sample costs exceed applicable rent expenses in Sacramento, Placer, or Yolo counties, including areas within the NBC.

2. **Fertilizers/Pesticides** represent the second largest difference between the tenant's expenses and the UCCE sample costs. The 2015 tenant costs are approximately $70/acre greater than the UCCE estimates, although the 2014 tenant costs were only $5/acre greater than the UCCE estimates. This difference is likely due to cultural practices.

3. **Water** costs represent the third largest difference between the tenant's expense and the UCCE sample costs. The UCCE estimate is approximately $55/acre less than the tenant's expenses. This is because the cost of water varies widely throughout the Sacramento Valley (see range of $21/acre to $140/acre described in number 4 in the introduction).

4. The tenant's **seed** expense is approximately $11/acre less than the UCCE sample cost. The UCCE sample costs are based on Calrose rice. The tenant's expense may be greater due to different seed selection. A more accurate assessment of the tenant's expenses could be made with more detailed information about the tenant's seed.

5. The tenant subtotal and UCCE subtotal for **equipment, labor, seeding, harvest freight, and drying and storage** services are fairly similar. Any differences are likely due to cultural practices and/or environmental factors, or a variation in local fuel and drying costs. A more accurate assessment of the tenant's expenses could be made with more detailed information about the tenant's cultural practices.

Regional Comparison/Rent Evaluation

Sheet 7 and Sheet 8 include tabular and graphical summaries of a regional comparison among gross revenues relative to rent prices. Gross revenues were calculated for several scenarios based on yield and a range of market prices for specific years. Scenarios include:

- Base Scenario, 2015 in NBC
- Scenario 1, the 2015 UCCE sample costs
- Scenario 2, 2016 in NBC
- Scenario 3, 2017 in NBC
- Scenario 4, 2017 water prices from Sutter Mutual Water Company (no rent estimates available)
- Scenario 5, 2016 water prices from RD 108 (no rent estimates available)

Assumptions for each scenario are included on Sheet 7. Water costs are the largest factor affecting costs after rent, so gross revenue in each scenario was adjusted by subtracting water costs, resulting in an adjusted gross revenue representing the money available to the grower from revenue after selling rice and paying for water, relative to the Base Scenario. Observations from Sheet 7 and Sheet 8 include the following:

1. A grower in Scenario 1 (the UCCE sample costs) has about $150/acre MORE to spend on rent than the Base Scenario (NBC 2015), yet rent was about $125/acre more, on average, than the Base Scenario (NBC 2015). This suggests that even rent in the Base Scenario was HIGH relative to the UCCE sample cost.

2. With a much lower rice price, a grower in Scenario 2 (NBC 2016) has almost $700 LESS per acre than the Base Scenario (NBC 2015) to spend in rent, yet paid a bit more, suggesting that the 2016 rent was HIGH relative to 2015, when considering the grower's ability to pay.

3. The ability to pay in Scenario 3 (NBC 2017) is the same as Scenario 2 (NBC 2016), so the same conclusion would follow.

4. If rent were scaled to ability to pay, and the UCCE sample costs were considered reasonable, then NO RENT would be charged in Scenario 2 (NBC 2016) or Scenario 3 (NBC 2017). In reality, however, we know that growers often continue to pay rent when rice prices are low, in the hopes of retaining the lease and recouping losses when prices improve.

5. The water cost differences with Sutter Mutual and RD 108 are not enough to significantly change the AGR.

6. Water cost information was sought, but not obtained, from Conaway Ranch and Pleasant Grove Verona. Unfortunately, these comparisons may not be very informative unless rent information were also known.

Key Conclusions

The 2015 UCCE sample costs to produce medium grain rice in the Sacramento Valley were developed as a guide for rice growers, and are intended to inform production decisions and potential returns. As noted in the study, a grower will achieve a positive cash flow when net returns are sufficient to cover annual operating expenses. Land rent is the largest operating expense and market prices are the largest factor of net returns. Thus, land rent and market prices must be closely evaluated to inform production decisions.
The purpose of this analysis was to evaluate rental prices in the NBC relative to the UCCE sample costs. Although the UCCE sample costs provide a reasonable benchmark for some production expenses, it is not relevant to inform rental prices in the NBC because the UCCE sample costs assume 2013 market prices (which were significantly higher than current prices). Furthermore, the rents cited in the sample costs were anecdotal and provided verbally by 10 growers from areas in the northern Sacramento Valley. Additional information is provided below:

1. **The UCCE sample rent costs are not applicable to the current market**. Market prices used in the UCCE estimates were $20.70 cwt based on 2013 USDA prices (assumed loan value of $6.60, or $14.10 above loan value). Current market prices are significantly lower, at approximately $5.50/cwt to $6/cwt above loan value. This reduction significantly affects a grower's ability to pay and, as a result, cash rents are driven lower. As an example, in the 2012 UCCE study, market prices were estimated at $17/cwt (assumed loan value of $6.50, or $10.50 above loan value) and cash rents were reported at $280/acre. As shown on worksheet 7, if rent were scaled to ability to pay, and the UCCE sample costs were considered reasonable, then NO RENT would be charged in Scenario 2 (NBC 2016) or Scenario 3 (NBC 2017). In reality, however, we know that growers often continue to pay rent when rice prices are low, in the hopes of retaining the lease and recouping losses when prices improve.

2. **The UCCE sample rent costs exceed applicable rent expenses in Sacramento, Placer, or Yolo counties, including areas within the NBC**. The UCCE sample rent costs were anecdotal and provided verbally by 10 growers from Colusa, Sutter, Butte, and Yuba counties. The estimate did not include information from any growers in Sacramento, Placer, or Yolo counties. Rice rents in these counties are typically lower than areas farther north in the Sacramento Valley because the northern areas have more growing degree days (fewer cool days), constituting more productive and less risky growing conditions. Queries to rice growers in Sacramento, Placer, and Yolo counties indicate a rental range of $150-$315/acre, which is consistent with the rents received by the NBC.

Table 1a. Summary Comparison of Rice Production Costs between UC Cooperative Extension's (UCCE) 2015 Sample Costs to Produce Rice and 2015 Costs from a Tenant of the Natomas Basin Conservancy (NBC)

	NBC Tenant 2015[1]	UCCE (w/Direct Ownership and Insurance Costs)		UCCE (w/o Direct Ownership and Insurance Costs)	
		Estimate	Difference (Tenant-UCCE)	Estimate	Difference (Tenant-UCCE)
Yield CWT	28,520.95	70,550.00	NA	70,550.00	NA
Acreage	331	830	NA	830	NA
Dry Yield/CWT	86.17	85.00	NA	85.00	NA
Cost/CWT	**$18.61**	**$20.83**	**($2.22)**	**$18.93**	**($0.57)**
Cost/Acre	$1,603.73	$1,770.65	($166.92)	$1,608.65	($27.20)

Table 1b. Summary Comparison of Rice Production Costs between UC Cooperative Extension's (UCCE) 2015 Sample Costs to Produce Rice and 2014 Costs from a Tenant of the Natomas Basin Conservancy (NBC)

	NBC Tenant 2014[1]	UCCE (w/Direct Ownership and Insurance Costs)		UCCE (w/o Direct Ownership and Insurance Costs)	
		Estimate	Difference (Tenant-UCCE)	Estimate	Difference (Tenant-UCCE)
Yield CWT	29,331.24	70,550.00	NA	70,550.00	NA
Acreage	328.90	830	NA	830	NA
Dry Yield/CWT	89.18	85.00	NA	85.00	NA
Cost/CWT	**$18.53**	**$20.83**	**($2.30)**	**$18.93**	**($0.77)**
Cost/Acre	$1,652.65	$1,770.65	($118.00)	$1,608.65	$10.02

Table 2. Summary of Annual Farming Expenses for a Tenant of the Natomas Basin Conservancy

	Crop Year 2014		Crop Year 2015	
Line Item	**Total**	**Per Acre**	**Total**	**Per Acre**
Labor	$44,660.00	$135.79	$46,046.00	$139.11
Equipment	$82,940.00	$252.17	$85,514.00	$258.35
Fertilizer/Pesticides	$147,155.96	$447.42	$169,858.32	$513.17
Seeding	$20,599.26	$62.63	$19,966.00	$60.32
Rent	$132,342.55	$402.38	$97,199.30	$293.65
Harvest Freight	$10,387.92	$31.58	$12,254.00	$37.02
Drying and Storage	$48,436.80	$147.27	$46,569.60	$140.69
Published Water Tariff	$45,858.53	$139.43	$46,052.03	$139.13
Insurance	$11,175.00	$33.98	$7,377.00	$22.29
Total Expense	**$543,556.02**	**$1,652.65**	**$530,836.25**	**$1,603.73**
Yield CWT	29331.24		28,520.95	
Acreage	328.9		331	
Dry Yield	89.18		86.17	
Cost/CWT	$18.53		$18.61	
Cost/Acre	$1,652.65		$1,603.73	

Notes

1. Example costs provided by one tenant are considered to be representative of tenant costs in the Natomas Basin Conservancy due to identical rent costs and similar costs from local suppliers for diesel fuel, fertilizers, etc. A second tenant reviewed the expenses and agreed they were very similar to his expenses for the same time period.

2. In 2014 and 2015, the Natomas Central Mutual Water Company (NCMWC) engaged in water sales and used the proceeds of the sales to reduce cost of water to shareholders. Accordingly, the tenant-reported water costs were not representative of the actual cost of water due to the distribution of these proceeds. To support the comparison with the UCCE study, the tenant water costs were normalized to the published water tariffs.

Table 3. Summary of UCCE Sample Costs and Assumptions for Production of Medium Grain Rice in the Sacramento Valley

Item	Assumptions	Labor Subtotal	Other Subtotal (Fuel, Materials, etc)	Total Annual Cost/Acre
OPERATING COSTS				
Cultural				
Field Prep	Chiseled two times ($36/acre), disced once with a stubble disc ($18/acre), disced twice with a finish disc ($34/acre), then leveled and smoothed with a triplane ($8/acre) once every two years. Laser leveling is assumed every other year ($20/acre). Maintenance of drains and levees is assumed at 5% of acres/year ($11/acre/year).	$21.00	$106.00	$127.00
Fertilizer	Aqua ammonia applied pre-plant at 130 lbs. of N/acre ($98/acre), 3 to 4 inches deep; starter fertilizer 12-23-20 at 200 lbs./acre is applied by ground and incorporated using a corrugated roller (can also be applied by air) ($52/acre). Zinc sulfate applied by air to 50% of acres at 30 lbs./acre ($12/acre). Ammonium sulfate applied to 75% of acres at 31.5 lbs. of N/acre ($29/acre).	$2.00	$189.00	$191.00
Planting	Water seeding at rate of 165 lbs./acre. Seed, soaking, and delivery ($58/acre) and planting ($14/acre).	$0.00	$72.00	$72.00
Irrigation	Irrigation water sources and cost vary widely. Assumes $150/acre for water and $35/acre for labor. Does not include water for straw management. The water delivery system or returns system is not calculated as a cost in this study.	$35.00	$150.00	$185.00
Pesticides	**Weeds.** Several sprays are assumed. Broadleaf and grass weeds controlled with separate aerial and ground applications. Cerano is applied aerially to 100% of acres ($77/acre). An additional ground application of Propanil and Grandstand is ground-applied to 100% of acres ($96/acre), followed by a ground application of a clean-up herbicide on 80% of acres ($36/acre). **Insects**. Rice water weevil is controlled on 15% of acres ($4/acre). Armyworms are controlled on 5% of acres ($1/acre). **Arthropod Mgmt**. Copper sulfate is applied once to 60% of acres ($8/acre). **Diseases**. Blast and aggregate sheath spot are controlled with one application of Quadris on 80% of acres ($31/acre).	$0.00	$253.00	$253.00
Pick-up Truck Use	For general use, assumes $12/acre for labor, fuel, and repairs of a 1/2 ton pickup truck, and $12/acre for labor, fuel, and repairs of a 3/4 ton pickup truck.	$16.00	$8.00	$24.00
Cultural Subtotal		*$74.00*	*$778.00*	*$852.00*
Harvest				
Yield	85 cwt/acre	NA	NA	NA
Harvest Equipment	Harvest is at 20% kernel moisture using one combine with a cutter-bar header ($55/acre) and grain cart ($24/acre).	$15.00	$64.00	$79.00
Harvest Freight	The cost of transporting rice is based on a green weight of 98 hundredweight (cwt) per acre and a $0.50 per cwt field pickup and hauling charge. The cost of transporting rice from the field to the dryer is included ($49), but the hauling cost between the dryer and warehouse is not.	$0.00	$49.00	$49.00
Drying and Storage	Assumed to dry down to 13% moisture. Drying rate is based on a green weight of 98 cwt. Current cost of drying is $0.95/cwt. Storage is $0.78/cwt. Most of the drying cost ($159/acre) is related to natural gas prices. The storage cost is related to electricity prices.	$0.00	$159.00	$159.00
Assessments	Assessments equal $0.07/cwt for rice research funded by the California Rice Research Board. In addition, the California Rice Commission (CRC) assesses each rice grower $0.07 per dry cwt. Rice millers and marketers also contribute $0.07 per dry cwt to the CRC.	$0.00	$12.00	$12.00
Harvest Subtotal		*$15.00*	*$284.00*	*$299.00*
Other Operating Costs				
Post-Harvest	Burning on 8% of acres at $2.50/acre ($11/acre). Straw is chopped, flooded, and rolled on 30% of acres ($17/acre), and 62% of acreage is chopped ($6/acre) and disced twice ($11/acre). Also includes disc on 30% of acreage ($5).	$21.00	$29.00	$50.00

Item	Assumptions	Labor Subtotal	Other Subtotal (Fuel, Materials, etc)	Total Annual Cost/Acre
Interest on Operating Capital	Assumed at 5.75%.	$0.00	$25.00	$25.00
Other Costs Subtotal		*$21.00*	*$54.00*	*$75.00*
Operating Costs Subtotal				$1,226.00
CASH OVERHEAD				
Rent	The UCCE rent estimate is based on verbal information provided by approximately 10 rice growers from Colusa, Sutter, Butte, and Yuba counties. The UCCE estimate for rent in these counties is $425/acre, based on an estimated range of $350-$500/acre (related assumptions include yield of 85 cwt/acre and a selling price of $20.70/cwt). It is not clear whether the verbal estimates pertained to the 2014 season or the 2015 season. It should be noted that rice rents are typically higher farther north in the Sacramento Valley because there are more heating degree days and fewer cool days, which provides better growing conditions. The rental range did not include rental prices from Sacramento, Yolo, or Placer counties.	$0.00	$425.00	$425.00
Liability Insurance	Liability insurance covers accidents on the farm and costs $14,994 for the entire farm ($17.85/acre).	$0.00	$18.00	$18.00
Crop Insurance	The grower is assumed to purchase a 75 percent yield protection policy, with an additional 55 percent PP coverage level, assumed to cost $18 per acre.	$0.00	$18.00	$18.00
Property Insurance	Insurance varies depending on assets. Property insurance provides coverage for property loss and is charged at 0.843% of the average value of the assets over their useful life (assumed at $1/acre).	$0.00	$1.00	$1.00
Compliance and Administration	Office and business expenses are estimated at $50 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities.	$0.00	$50.00	$50.00
Regulatory Compliance and Administrative Costs	Compliance and administrative costs are estimated to be $25 per acre. This includes expenses such as managing paperwork for compliance, as well as miscellaneous administrative costs that accompany the compliance paperwork.	$0.00	$25.00	$25.00
Property Taxes	Property taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis. Land is valued at $10,000/acre. Assume that 10 acres are owned in this study. Property tax estimate is $4/acre.	$0.00	$4.00	$4.00
Investment Repairs	Annual repairs on investments or capital recovery items that require maintenance are calculated as 2% of the purchase price. This includes repair on all investments (e.g. fuel tanks and pumps, backhoe, irrigation system, shop buildings, tools, etc.), except for land. Estimate is $3/acre.	$0.00	$3.00	$3.00
Cash Overhead Subtotal		$0.00	$544.00	$544.00
NON-CASH OVERHEAD				
Land	In the study, the grower owns 10 acres and rents 830 acres. Rice is grown on 800 acres and 40 acres are used for roads, irrigation systems, etc. Land value estimated at $10,000/acre. Property taxes are calculated as 1% of the average value of the property ($10,000/acre).	$0.00	$6.00	$6.00
Equipment	Assumes all equipment: backhoe, fuel tanks and pumps, fuel wagons, irrigation system, shop building, shop tools, tool carrier, and all field equipment.	$0.00	$61.00	$61.00
Capital Recovery Costs	Capital recovery cost is the annual depreciation and interest costs for a capital investment. An interest rate of 4.75% is used to calculate capital recovery.	NA	NA	4.75%

Item	Assumptions	Labor Subtotal	Other Subtotal (Fuel, Materials, etc)	Total Annual Cost/Acre
Non-Cash Overhead Subtotal		$0.00	$67.00	$67.00
TOTAL COSTS/ACRE		**$110.00**	**$1,727.00**	**$1,837.00**
TOTAL COSTS/CWT				**$21.61**

Source: UC Cooperative Extension's (UCCE) 2015 (Amended June 2016) Sample Costs to Produce Rice.

Note: The organization of costs (i.e., operating, cash overhead, and non-cash overhead) is consistent with the UCCE study.

Table 4. Summary of UCCE Assumptions Related to Cost Estimates for Labor and Equipment

Item	Assumptions
Labor	Labor rate is $20.55/hour for non-machine labor, $21/hour for equipment labor, including an overhead expense of 40% (the basic hourly rate is $15 for equipment operation, $25 for irrigation labor, and $14.68 for non-machine labor).
Equipment Operating Costs	On-farm delivery of red dye diesel and gasoline are $3.88 and $3.79, respectively.
Rented Equipment	Tractor rented for 250 hours to cover tillage operations on 800 acres.

Source: UC Cooperative Extension's (UCCE) 2015 (Amended June 2016) Sample Costs to Produce Rice.

Table 5. Detailed Cost Comparison between Tenant Expenses and UCCE Cost Estimates (Crop Years 2014 and 2015)

Item	NBC Tenant 2014	NBC Tenant 2015	UCCE Estimate	Difference (Tenant 2014-UCCE Estimate)	Difference (Tenant 2015-UCCE Estimate)	Notes
	Cost/Acre	Cost/Acre	Cost/Acre	Cost/Acre	Cost/Acre	
Production Costs[1]						
Labor	$135.79	$139.11	$110.00	$25.79	$29.11	Difference likely due to different cultural practices.
Equipment	$252.17	$258.35	$268.00	($15.83)	($9.65)	UCCE sample costs include field prep ($106/acre), pick-up truck ($8/acre), harvest ($64/acre), and post-harvest ($29/acre). Also includes other necessary equipment ($61/acre). Difference likely due to different cultural practices.
Fertilizer/Pesticides	$447.42	$513.17	$442.00	$5.42	$71.17	UCCE sample costs include fertilizer ($189/acre) and pesticides ($253/acre). Difference likely due to different cultural practices.
Seeding	$62.63	$60.32	$72.00	($9.37)	($11.68)	UCCE sample costs include seed, soaking and delivery ($58/acre). Also includes planting ($14/acre). Difference likely due to different cultural practices.
Rent	$402.38	$293.65	$425.00	($22.62)	($131.35)	UCCE sample costs for cash rents were between $350 and $500 with surface water rights attached to the land. An average of $425/acre is included for rent in the UCCE study. The range is based on verbal information provided by approximately 10 rice growers at a meeting in Yuba City. It is not clear whether the verbal estimates pertained to the 2014 season or the 2015 season. It should be noted that rice rents are typically higher farther north in the Sacramento Valley because there are more heating degree days and fewer cool days, which provides better growing conditions.
Harvest Freight	$31.58	$37.02	$49.00	($17.42)	($11.98)	Freight estimate based on a green weight of 98 cwt/acre and a $0.50/cwt field pickup and hauling charge ($49/acre).
Drying and Storage	$147.27	$140.69	$159.00	($11.73)	($18.31)	Drying estimate based on a green weight of 98 cwt/acre and a $0.95/cwt drying cost. Storage is $0.78/cwt. Total estimate is $159/acre.
Water	$139.43	$139.13	$83.65	$55.78	$55.48	The UCCE sample costs estimate $150/acre for water. This sample cost is based on anecdotal information provided verbally by approximately 10 rice growers at a meeting in Yuba City. The $150/acre estimate assumes that some growers supplement canal/district water with well water, which is more expensive than surface water. Inquiries to water districts identified the following water rates for rice: Western Canal Water District: $21/acre; Richvale Irrigation District: $50/acre; Reclamation District 108: $75.46/acre; Glenn-Colusa Irrigation District (GCID): $83.65/acre; and Sutter Mutual: $126.50/acre. Based on these inquiries, the UCCE sample cost of $150/acre is high relative to surface water costs for rice in the Sacramento Valley. For this comparison, the sample cost for water in the Sacramento Valley was adjusted to $83.65/acre, which is the GCID's published tariff (GCID delivers water to the greatest number of rice growers in the Sacramento Valley).

Table 5. Detailed Cost Comparison between Tenant Expenses and UCCE Cost Estimates (Crop Years 2014 and 2015)

Insurance	$33.98	$22.29	$151.00	($117.02)	($128.71)	Estimate includes liability insurance ($18/acre), office and business expenses ($50/acre), regulatory and administrative costs ($25/acre), investment repairs ($3/acre), assessments ($12/acre), crop insurance ($18/acre), and interest on operating capitol ($25/acre). The tenant's cost is significantly lower than the UCCE estimate.
Subtotal Production Costs	**$1,652.65**	**$1,603.73**	**$1,759.65**	**($107.00)**	**($155.92)**	
Direct Costs for Land Ownership						
Property Insurance	$0.00	$0.00	$1.00	($1.00)	($1.00)	Assume this is a direct cost for land ownership.
Property Taxes	$0.00	$0.00	$4.00	($4.00)	($4.00)	Assume this is a direct cost for land ownership.
Land	$0.00	$0.00	$6.00	($6.00)	($6.00)	Assume this is a direct cost for land ownership.
Subtotal Land Ownership Costs	**$0.00**	**$0.00**	**$11.00**	**($11.00)**	**($11.00)**	
TOTAL COSTS/ACRE	**$1,652.65**	**$1,603.73**	**$1,770.65**	**($118.00)**	**($166.92)**	
TOTAL COSTS/CWT	**$18.53**	**$18.61**	**$20.83**	**($2.30)**	**($2.22)**	

Notes:

[1]Line items for production costs correspond to line items provided by the tenant.

[2]Direct land ownerships costs are assumed to be land, property insurance, and property taxes.

[3]Assume that liability insurance is a tenant expense.

Table 6. Adjusted Cost Comparison between Tenant Expenses and UCCE Cost Estimates (Crop Years 2014 and 2015)*

Item	NBC Tenant 2014	NBC Tenant 2015	UCCE Estimate	Difference (Tenant 2014-UCCE Estimate)	Difference (Tenant 2015-UCCE Estimate)	Notes
	Cost/Acre	Cost/Acre	Cost/Acre	Cost/Acre	Cost/Acre	
Production Costs[1]						
Labor	$135.79	$139.11	$110.00	$25.79	$29.11	Difference likely due to different cultural practices.
Equipment	$252.17	$258.35	$268.00	-$15.83	-$9.65	UCCE sample costs include field prep ($106/acre), pick-up truck ($8/acre), harvest ($64/acre), and post-harvest ($29/acre). Also includes other necessary equipment ($61/acre). Difference likely due to different cultural practices.
Fertilizer/Pesticides	$447.42	$513.17	$442.00	$5.42	$71.17	UCCE sample costs include fertilizer ($189/acre) and pesticides ($253/acre). Difference likely due to different cultural practices.
Seeding	$62.63	$60.32	$72.00	-$9.37	-$11.68	UCCE sample costs include seed, soaking and delivery ($58/acre). Also includes planting ($14/acre). Difference likely due to different cultural practices.
Rent	$402.38	$293.65	$425.00	-$22.62	-$131.35	UCCE sample costs for cash rents were between $350 and $500 with surface water rights attached to the land. An average of $425/acre is included for rent in the UCCE study. The range is based on verbal information provided by approximately 10 rice growers at a meeting in Yuba City. It is not clear whether the verbal estimates pertained to the 2014 season or the 2015 season. It should be noted that rice rents are typically higher farther north in the Sacramento Valley because there are more heating degree days and fewer cool days, which provides better growing conditions.
Harvest Freight	$31.58	$37.02	$49.00	-$17.42	-$11.98	Freight estimate based on a green weight of 98 cwt/acre and a $0.50/cwt field pickup and hauling charge ($49/acre).
Drying and Storage	$147.27	$140.69	$159.00	-$11.73	-$18.31	Drying estimate based on a green weight of 98 cwt/acre and a $0.95/cwt drying cost. Storage is $0.78/cwt. Total estimate is $159/acre.

Table 6. Adjusted Cost Comparison between Tenant Expenses and UCCE Cost Estimates (Crop Years 2014 and 2015)*

Item	NBC Tenant 2014	NBC Tenant 2015	UCCE Estimate	Difference (Tenant 2014-UCCE Estimate)	Difference (Tenant 2015-UCCE Estimate)	Notes
	Cost/Acre	Cost/Acre	Cost/Acre	Cost/Acre	Cost/Acre	
Water	$139.43	$139.13	$83.65	$55.78	$55.48	The UCCE sample costs estimate $150/acre for water. This sample cost is based on anecdotal information provided verbally by approximately 10 rice growers at a meeting in Yuba City. The $150/acre estimate assumes that some growers supplement canal/district water with well water, which is more expensive than surface water. Inquiries to water districts identified the following water rates for rice: Western Canal Water District: $21/acre; Richvale Irrigation District: $50/acre; Reclamation District 108: $75.46/acre; Glenn-Colusa Irrigation District (GCID): $83.65/acre; and Sutter Mutual: $126.50/acre. Based on these inquiries, the UCCE sample cost of $150/acre is high relative to surface water costs for rice in the Sacramento Valley. For this comparison, the sample cost for water in the Sacramento Valley was adjusted to $83.65/acre, which is the GCID's published tariff (GCID delivers water to the greatest number of rice growers in the Sacramento Valley).
TOTAL COSTS/ACRE	**$1,618.67**	**$1,581.45**	**$1,608.65**	**$10.02**	**($27.20)**	
TOTAL COSTS/CWT	**$18.15**	**$18.35**	**$18.93**	**($0.77)**	**($0.57)**	

Notes:

* Adjustments were made to the UCCE estimate to exclude direct land ownership and insurance costs. Direct land ownerships costs are assumed to be land, property insurance, and property taxes. In addition, the category for insurance costs was excluded because there was not enough information to determine whether the tenant costs included the insurance and professional items identified in the UCCE sample costs. Thus, this adjusted comparison excluded direct land ownership and insurance costs.

[1]Line items for production costs correspond to line items provided by the tenant.

[2]Assume that liability insurance is a tenant expense.

Table 7. Summary of Regional Comparison among Gross Revenues relative to Rent Prices

Item	Base Scenario (NCMWC 2015)	Scenario 1 (UCCE 2015)	Scenario 2 (NCMWC 2016)	Scenario 3 (NCMWC 2017)	Scenario 4 (Sutter Mutual)	Scenario 5 (RD 108)	Scenario 6 (Pleasant Grove-Verona)	Scenario 7 (Conaway Ranch)
Baseline Assumptions								
Yield (CWT)	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
Water Cost/Acre	$139.13	$83.65	$145.52	$142.80	$126.50	$75.46	TBD	TBD
Rent/Acre	$293.00	$425.00	$325.00	NA	NA	NA	NA	NA
Market Price/CWT*	$13.00	$14.10	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50
Gross Return/Acre (yield x market price)	$1,170.00	$1,269.00	$495.00	$495.00	$495.00	$495.00	$495.00	$495.00
Adjustment for Market Price and Water								
Yield Difference (%)	-	-	-	-	-	-	-	-
Water Cost Difference	$0.00	-$55.48	$6.39	$3.67	-$12.63	-$63.67	#VALUE!	#VALUE!
Market Price/CWT (difference from base scenario)	$0.00	$1.10	-$7.50	-$7.50	-$7.50	-$7.50	-$7.50	-$7.50
Adjusted Gross Return (gross return - water cost difference)	$1,170.00	$1,324.48	$488.61	$491.33	$507.63	$558.67	#VALUE!	#VALUE!
AGR Difference from Base Scenario	$0.00	$154.48	-$681.39	-$678.67	-$662.37	-$611.33	#VALUE!	#VALUE!

Sources

*Market prices of $13/cwt are intended to represent a break even point. Prices of $5.50/cwt are intended to represent current market prices. All prices are above loan.

[1]Farming in Compliance with Habitat Conservation Plans, HCP Implementation and Annual Budget (PowerPoint, February 2017)

[2]Natomas Central Mutual Water Company - Notice of Assessments and Charges for 2015 (standby fee + admin fee + water duty).

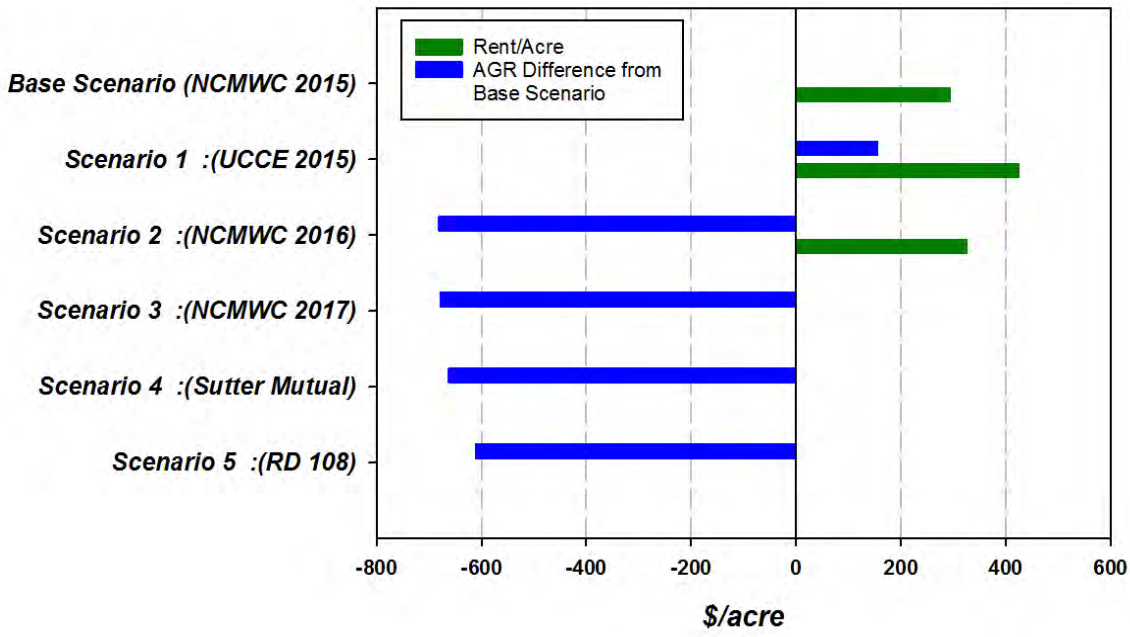
[3]UC Cooperative Extension's (UCCE) 2015 (Amended June 2016) Sample Costs to Produce Rice. Rent estimate based on a range of $350-$500/acre provided verbally by approximately 10 growers in the northern Sacramento Valley.

[4]Natomas Central Mutual Water Company - Notice of Assessments and Charges for 2016 (standby fee + admin fee + water duty).

[5]Natomas Central Mutual Water Company - Notice of Assessments and Charges for 2017 (standby fee + admin fee + water duty).

[6]Sutter Mutual Water Company - Notice to Landowners and Water Users (April 3, 2017)

[7]Reclamation District 108 Report Detailing the Cost of Service (January 15, 2016)



Summary of Cost Comparison. Adjusted gross revenue difference equals the money available to the grower from revenue after paying for water, relative to the Base Scenario (NCMWC 2015). Bars on the right of zero represent more money available to pay for rent. Bars on the left of zero represent less money available to pay for rent.