# NC STATE UNIVERSITY

Enter effective acreage covered ==>

IRR-E31 Nov-07

## **IRRIGATION COST SPREADSHEET**

#### ENTER YOUR DATA IN THE YELLOW HIGHLIGHTED CELLS

# Type: Center Pivot, 600 foot system, electricity powered

### BRIEF DESCRIPTION:

600 ft sprinkler system plus end gun. Full circle covers 31.5 acres. Power source is commercially supplied electricity.

Adequate water required drilling a new well. Well capacity of 400 GPM is required. System operates 40.6 hours to apply 1 acre inch of water.

acres

31.5

NPESTMENT COST   1	Enter hours required to apply 1 acre inch ==>		40.6	hours						
Power service (PPVC pipe and fittings (PPVC pipe and fittings) (PPVC pip	INVESTMENT COST									
Fere	Item	Unit	Quantity	Cost/unit	Total	Per Acre				
Sprinker System (3 towers)   1	Power service		1	\$2,000.00	\$2,000	\$63.49				
Pump motor, 20 HP Well         1 56,500.00 \$17,500.00 \$17,500.00 \$5755.50 \$120.635         3206.35 \$120.635         3206.35 \$120.635         3206.35 \$120.635         3206.35 \$120.635         3206.35 \$120.635         3206.35 \$120.635         3206.35 \$120.635         3206.35 \$120.00 \$120.000         3200.089         3200.08.89         3200.089         3200.089         3200.089         3200.089         3200.000         3200.00 \$20.000         10 \$200.00 \$85.00 \$14.00 \$299         329.49         3200.00 \$20.00	6"PVC pipe and fittings	Feet	600	\$5.83	\$3,498	\$111.05				
Mell	Sprinker System (3 towers)		1	\$33,782.00	\$33,782	\$1,072.44				
Total investment cost:   S63,280   S2,008.89   S2,0	Pump motor, 20 HP		1	\$6,500.00	\$6,500	\$206.35				
ANNUAL FIXED COSTS    Item	Well		1	\$17,500.00	\$17,500	\$555.56				
Item         Investment Oct         Salvage Value Value Vars         Useful Life Value Vars         Deprec I aiton value Vars         Interest Var I aiton value Vars         Total DITI Per Acre           Enter interest and property tax + insurance rate, as a percentage of variety of Provence Service         \$2,000         \$0.00         \$200.00         \$85.00         \$14.00         \$299         \$9.49           6°PVC pipe and fittings         \$33,498         \$0.00         20         \$174.90         \$148.67         \$24.49         \$348         \$11.05           85prinker System (3 towers)         \$33,782         \$0.00         20         \$174.890         \$148.67         \$24.49         \$348         \$11.05           8prinker System (3 towers)         \$33,782         \$0.00         20         \$325.00         \$174.50         \$647         \$20.53           Well         \$17,500         \$0.00         20         \$325.00         \$743.75         \$122.50         \$51,741         \$55.28           Total Fixed Cost         \$63,280         \$	Total investment cost:				\$63,280	\$2,008.89				
Per Acre	ANNUAL FIXED COSTS									
Reter interest and property tax + insurance rate, as a percentage of value==>   Power service   \$2,000   \$0.00   10   \$200.00   \$85.00   \$14.00   \$34.00   \$93.49   \$9.40   \$9.40	Item	Investment	Salvage	Useful Life	•	Interest <sup>2</sup>	Tax & Ins <sup>2</sup>	Total	Total	
Power service   \$2,000   \$0.00   10   \$200.00   \$85.00   \$14.00   \$299   \$9.49   \$6'PVC pipe and fittings   \$3,498   \$0.00   20   \$174.00   \$148.67   \$24.49   \$338   \$11.05   \$201.06   \$14.00   \$14.00   \$24.49   \$33.782   \$0.00   20   \$16.891.0   \$14.85.74   \$236.47   \$33.361   \$106.71   \$106.		Cost	Value	Years	iation <sup>1</sup>			DITI	Per Acre	
6°PVC pipe and fittings         \$3,498         \$0.00         20         \$174.90         \$148.67         \$24.49         \$348         \$11.05           Sprinker System (3 towers)         \$33,782         \$0.00         20         \$1,689.10         \$1,435.74         \$236.47         \$3,361         \$106.71           Pump motor, 20 HP         \$6,500         \$0.00         20         \$325.00         \$743.75         \$122.50         \$1,741         \$55.28           Well         \$63,280         Fuel Cost         \$3,264.00         \$2,689.40         \$442.96         \$6,396         \$203.06           ANNUAL OPERATING COST         Item         Fuel Use         Fuel Cost         Acre inches         Total         Total         Per Acre           Fuel         40.6         20         0.746         \$0.085         \$5.0         \$257         \$8.17           Power service         \$2,000         0.00%         \$0.085         \$5.0         \$257         \$8.17           Pump motor, 20 HP         \$6,500         2.00%         \$0.085         \$5.0         \$0.00         \$0.00           \$97/40 pipe and fittings         \$3,498         0.00%         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00	Enter interest and property tax + insurance rate, as a percentage of value==>					8.50%	1.40%			
Sprinker System (3 towers)         \$33,782         \$0.00         20         \$1,689.10         \$1,435.74         \$236.47         \$3,361         \$106.71           Pump motor, 20 HP         \$6,500         \$0.00         20         \$325.00         \$276.25         \$45.50         \$64.7         \$20.53           Well         \$17,500         \$0.00         20         \$875.00         \$743.75         \$122.50         \$1,741         \$555.28           Total Fixed Cost         \$63,280         ***         ***         \$3,264.00         \$2,689.40         \$442.96         \$6,396         \$203.06           ANNUAL OPERATING COST           Item         Hours per Rated Fuel Use Real Use Repairs and Maintenance Repairs and Maintenance Initial Cost         ***         ***         ***         ***         ***         ***         ***         **         **         **         **         **         **         **         **         \$6,396         **         **         **         **         **         **         **         **         ** <td co<="" td=""><td>Power service</td><td>\$2,000</td><td>\$0.00</td><td>10</td><td>\$200.00</td><td>\$85.00</td><td>\$14.00</td><td>\$299</td><td>\$9.49</td></td>	<td>Power service</td> <td>\$2,000</td> <td>\$0.00</td> <td>10</td> <td>\$200.00</td> <td>\$85.00</td> <td>\$14.00</td> <td>\$299</td> <td>\$9.49</td>	Power service	\$2,000	\$0.00	10	\$200.00	\$85.00	\$14.00	\$299	\$9.49
Pump motor, 20 HP	6"PVC pipe and fittings	\$3,498	\$0.00	20	\$174.90	\$148.67	\$24.49	\$348	\$11.05	
Second	Sprinker System (3 towers)	\$33,782	\$0.00	20	\$1,689.10	\$1,435.74	\$236.47	\$3,361	\$106.71	
Total Fixed Cost   \$63,280   \$3,264.00   \$2,689.40   \$442.96   \$6,396   \$203.06	Pump motor, 20 HP	\$6,500	\$0.00	20	\$325.00	\$276.25	\$45.50	\$647	\$20.53	
ANNUAL OPERATING COST Item  Fuel Hours per acre inch Horse Power KWH/HP-hr \$/KWH applied³ Per Acre  Electricity 40.6 20 0.746 \$0.085 5.0 \$257 \$8.17  Repairs and Maintenance Initial Cost Cost Factor  Power service \$2,000 0.00% \$0.00% 6"PVC pipe and fittings \$3,498 0.00% \$0.00%  Sprinker System (3 towers) \$33,782 0.50% \$169 \$5.36  Pump motor, 20 HP \$6,500 2.00% \$0.00%  Well \$17,500 0.00% \$0.00%  Labor Hours Cost/hour  Labor 1.5 \$9.03 \$0.00  Total operating cost \$570 \$18.09  TOTAL ANNUAL COST	Well	\$17,500	\$0.00	20	\$875.00	\$743.75	\$122.50	\$1,741	\$55.28	
Fuel   Hours per acre inch   Horse Power   Rated   Fuel Use   Fuel Cost   Acre inches   Total   Total   Acre inches   Acre inches   Total   Acre inches   Per Acre   Acre inches   Acre inches   Acre inches   Per Acre   Acre inches   Per Acre   Acre inches   Acre inches   Acre inches   Per Acre   Acre inches   Per Acre   Acre inches   A	Total Fixed Cost	\$63,280			\$3,264.00	\$2,689.40	\$442.96	\$6,396	\$203.06	
Fuel         Hours per acre inch acre inch         Rated Horse Power acre inch         Fuel Use KWH/HP-hr S/KWH         Fuel Cost applied³         Total Per Acre           Electricity         40.6         20         0.746         \$0.085         5.0         \$257         \$8.17           Repairs and Maintenance         Initial Cost         Cost Factor         \$0.085         5.0         \$257         \$8.17           Power service         \$2,000         0.00%         \$0.006         \$0.00         \$0.00         \$0.00           6"PVC pipe and fittings         \$33,498         0.00%         \$0.00         \$0.00         \$0.00           Sprinker System (3 towers)         \$33,782         0.50%         \$169         \$5.36           Pump motor, 20 HP         \$6,500         2.00%         \$0.00         \$0.00         \$0.00           Labor         Hours         Cost/hour         \$130         \$14         \$0.43           Labor         1.5         \$9.03         \$15         \$570         \$18.09           TOTAL ANNUAL COST	ANNUAL OPERATING COST									
Second Control of Co	Item									
Electricity 40.6 20 0.746 \$0.085 5.0 \$257 \$8.17  Repairs and Maintenance Initial Cost Cost Factor  Power service \$2,000 0.00% \$0 \$0.00 6"PVC pipe and fittings \$3,498 0.00% \$0.50 \$0.00  Sprinker System (3 towers) \$33,782 0.50% \$169 \$5.36  Pump motor, 20 HP \$6,500 2.00% \$130 \$4.13  Well \$17,500 0.00% \$0.00  Labor Hours Cost/hour  Labor 1.5 \$9.03 \$1.5 \$9.03  Total operating cost \$570 \$18.09  TOTAL ANNUAL COST	Fuel	Hours per	Rated	Fuel Use	Fuel Cost	Acre inches	Total	Total		
Repairs and Maintenance         Initial Cost         Cost Factor           Power service         \$2,000         0.00%         \$0         \$0.00           6"PVC pipe and fittings         \$3,498         0.00%         \$0         \$0.00           Sprinker System (3 towers)         \$33,782         0.50%         \$169         \$5.36           Pump motor, 20 HP         \$6,500         2.00%         \$130         \$4.13           Well         \$17,500         0.00%         \$0         \$0.00           Labor         Hours         Cost/hour           Labor         1.5         \$9.03         \$14         \$0.43           Total operating cost         \$570         \$18.09           TOTAL ANNUAL COST		acre inch	Horse Power	KWH/HP-hr	\$/KWH	applied <sup>3</sup>		Per Acre		
Power service       \$2,000       0.00%       \$0       \$0.00	Electricity	40.6	20	0.746	\$0.085	5.0	\$257	\$8.17		
6"PVC pipe and fittings \$3,498 0.00% \$0.00 Sprinker System (3 towers) \$33,782 0.50% \$169 \$5.36 Pump motor, 20 HP \$6,500 2.00% \$130 \$4.13 Well \$17,500 0.00% \$0 \$0.00 Labor Hours Cost/hour Labor 1.5 \$9.03 \$14 \$0.43  Total operating cost \$570 \$18.09  TOTAL ANNUAL COST	Repairs and Maintenance	Initial Cost	Cost Factor							
Sprinker System (3 towers)     \$33,782     0.50%     \$169     \$5.36       Pump motor, 20 HP     \$6,500     2.00%     \$130     \$4.13       Well     \$17,500     0.00%     \$0     \$0.00       Labor     Hours     Cost/hour       Labor     1.5     \$9.03     \$14     \$0.43       Total operating cost       TOTAL ANNUAL COST   Total Per Acre	Power service	\$2,000	0.00%				\$0	\$0.00		
Pump motor, 20 HP       \$6,500       2.00%       \$130       \$4.13         Well       \$17,500       0.00%       \$0       \$0.00         Labor       Hours       Cost/hour         Labor       1.5       \$9.03       \$14       \$0.43         Total operating cost         TOTAL ANNUAL COST	6"PVC pipe and fittings	\$3,498	0.00%				\$0	\$0.00		
Well         \$17,500         0.00%         \$0         \$0.00           Labor         Hours         Cost/hour           Labor         1.5         \$9.03         \$14         \$0.43           Total operating cost         \$570         \$18.09           TOTAL ANNUAL COST	Sprinker System (3 towers)	\$33,782	0.50%				\$169	\$5.36		
Labor         Hours         Cost/hour           Labor         1.5         \$9.03         \$14         \$0.43           Total operating cost         \$570         \$18.09           TOTAL ANNUAL COST           Total Per Acre	Pump motor, 20 HP	\$6,500	2.00%				\$130	\$4.13		
Labor 1.5 \$9.03 \$14 \$0.43  Total operating cost \$570 \$18.09  TOTAL ANNUAL COST Total Per Acre	Well	\$17,500	0.00%				\$0	\$0.00		
Total operating cost \$570 \$18.09  TOTAL ANNUAL COST  Total Per Acre	Labor	Hours	Cost/hour							
TOTAL ANNUAL COST  Total Per Acre	Labor	1.5	\$9.03				\$14	\$0.43		
Total Per Acre	Total operating cost						\$570	\$18.09		
	TOTAL ANNUAL COST									
Total Fixed and Operating Cost \$6,966 \$221.15							Total	Per Acre		
	Total Fixed and Operating Cost						\$6,966	\$221.15		

<sup>&</sup>lt;sup>1</sup> Depreciation = (Initial cost - Salvage value) / years of life

Costs estimates and the spreadsheet were developed by:

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We gratefully acknowledge the assistance of Gary Scalf, Rainman Irrigation, Mount Olive, NC and Ed Bullard, Valley Systems, Wade, NC.

<sup>&</sup>lt;sup>2</sup> Based on the average investment = (Initial cost + Salvage value) / 2 multiplied by the indicated percentage rate

<sup>&</sup>lt;sup>3</sup> The number of irrigation events likely will vary from 3 to 9 per season. A total application of five acre inches is used in this budget.