



MACHINERY COST ESTIMATE FOR CRANBERRY BOOM SPREADERS

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When calculating the cost of making a fertilizer or pesticide application one needs to consider all of the costs, not just the cost of the material to be applied. Dr. Paul Mitchell of the UW-Madison Dept. of Applied and Agricultural Economics made some rough estimates of what the cost of operating a cantilevered boom would be. In order to make these estimates certain assumptions had to be made. Obviously the full cost of operation would be different on every farm, but these estimated can be a place to begin.

The assumptions we made were that this was for a 90 foot boom pulled by a 100 HP tractor. Depreciation and interest expense are considered fixed costs. Labor, repairs & maintenance, and fuel & lubricants were considered variable costs. We also assumed 14 trips per year over the entire marsh and calculations were made for different sized farms of 30, 60, or 90 acres.

Depreciation was figured as straight line depreciation over 15 years. Boom depreciation was estimated at \$1000 per year. Tractor depreciation was \$3333 per year. This depreciation is spread over the annual use, so it varies by farm size (Tables 1-3). The tractor is used for other purposes as well and total use is estimated at 500 hours per year thus depreciation is $\$3333/500 = \6.67 per hour. At a spray rate of 7.5 acres per hour, depreciation is \$0.89 per acre per application.

Interest cost was figured at a 6% rate. Interest on the spreader was calculated to be \$2850 per year while interest on the tractor was figured at \$2100 per year. The per acre cost varies with farm size (Tables 1-3). Interest expense on the tractor is figured at \$0.56 per acre per application.

Labor was estimated with part-time labor at \$10/hour plus 7.7% benefits. If you cover 7.5 acres per hour this labor is \$1.44 per acre per application. Operator labor is figured at \$15.00/hour plus 7.7% benefits. In addition to the 7.5 acres per hour 10% overhead is figured for managing the part-time help, thus management cost is \$2.61 per acre per application.

Repairs and maintenance are calculated based on as purchase price x a repair factor per hour of use. Repair costs also vary by marsh size (Tables 1-3). Repairs on the tractor are \$3.08 per hour or \$0.45 per acre per application.

Diesel was calculated at \$1.80 per gallon (perhaps too low today). A 100 HP tractor uses 4.38 gallons per hour. Lubrication is figured as 15% of fuel cost. We assumed a 10% overhead on fuel cost to allow for time to refuel and lubricate in addition to the 7.5 acre per hour rate. The final cost for fuel and lubrication is \$1.33 per acre per application.

Tables 1-3 put all of the above information together by marsh size. Remember that these are estimates. Your costs will be different. Fixed costs such as depreciation and interest you incur if

the machine is used or not. Variable costs are incurred only as the equipment is used. One could argue that labor will be on the marsh anyway, but they would be doing other things if not making an application. Labor could also be considered an opportunity cost. Management costs (your labor) are also real and tangible and must be included.

The bottom line is that it costs between \$10 and \$20/acre/application to use a boom spreader. The cost of application could equal or exceed the cost of the material being applied thus both costs must be considered when deciding about the cost of application.

This analysis was based on several assumptions. If you want results for different assumptions contact Dr. Paul Mitchell at UW-Madison (608-265-6514 or pdmitchell@wisc.edu).

Table 1. Cost of operation of a 90 foot boom spreader pulled by a 100 HP tractor over 30 acres in 2005.

Category	Spreader	Tractor	Total
Depreciation	2.38	0.89	3.27
Interest	6.79	0.56	7.35
Labor	1.44	2.61	4.04
Fuel/Lube	0	1.33	1.33
Repairs/Maintenance	0.13	0.45	0.58
Total	10.73	5.84	16.57

Table 2. Cost of operation of a 90 foot boom spreader pulled by a 100 HP tractor over 60 acres in 2005.

Category	Spreader	Tractor	Total
Depreciation	1.19	0.89	2.08
Interest	3.39	0.56	3.95
Labor	1.44	2.61	4.04
Fuel/Lube	0	1.33	1.33
Repairs/Maintenance	0.06	0.45	0.52
Total	6.08	5.84	11.92

Table 3. Cost of operation of a 90 foot boom spreader pulled by a 100 HP tractor over 90 acres in 2005.

Category	Spreader	Tractor	Total
Depreciation	0.79	0.89	1.68
Interest	2.26	0.56	2.82
Labor	1.44	2.61	4.04
Fuel/Lube	0	1.33	1.33
Repairs/Maintenance	0.04	0.45	0.49
Total	4.53	5.84	10.37