

Costs to Create & Maintain Your Pollination Reservoir

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Pollinator Habitat

This area has been planted with pollinator-friendly flowers and is protected from pesticides to provide valuable habitat for bees and other pollinators.

To learn how you can help to bring back the pollinators, please visit www.xerces.org.



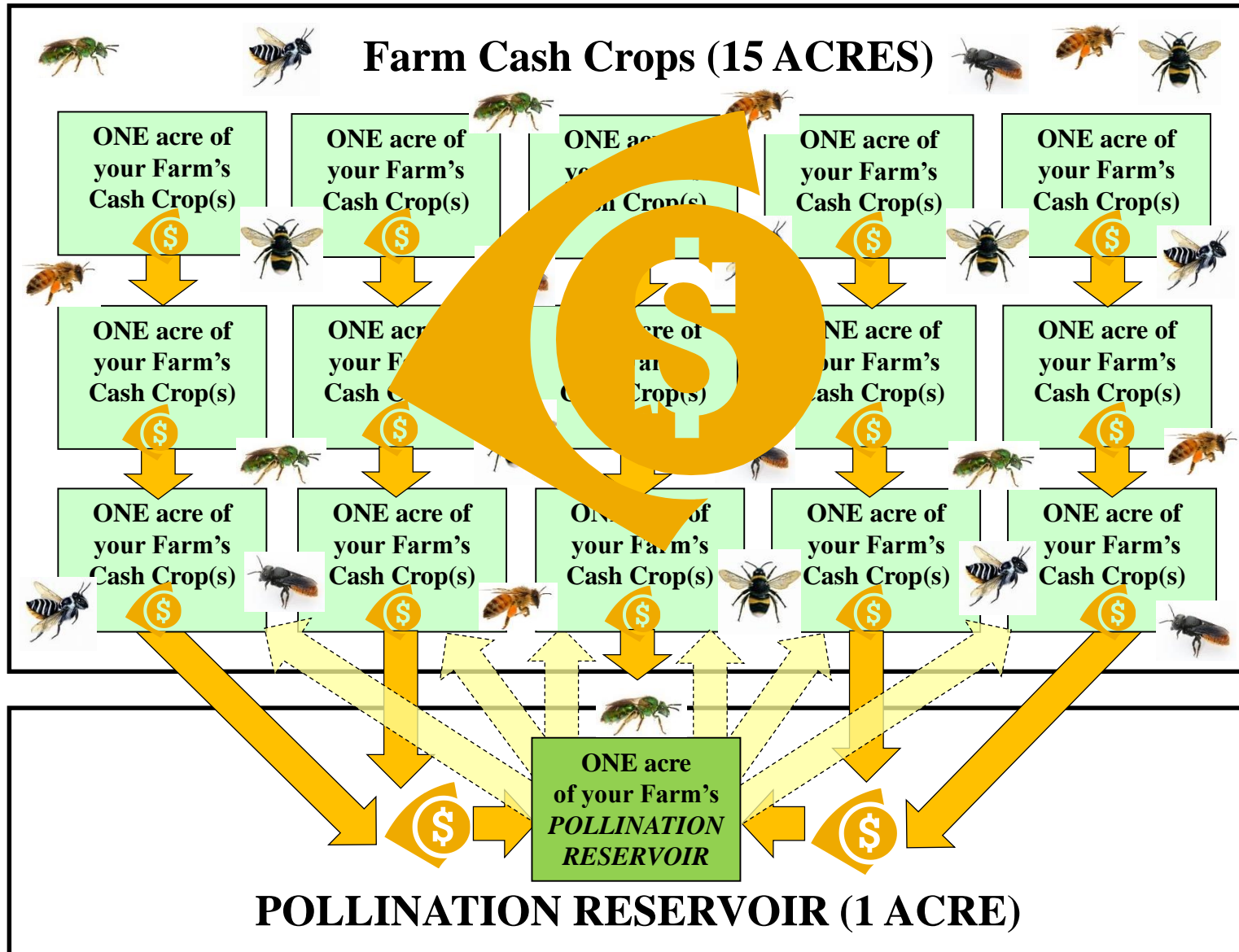
Creating and Improving Pollinator Habitat on Your Farm
The Connecticut Agricultural Experiment Station
March 9, 2017



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Your Farm's Pollination Reservoir



Pollinator Reservoir Budget Types

➤ Estimates *up-front & annual* costs

❖ **Up-front** – Establishment variable costs (VC) paid even if PR lasts for >1 year



PRBudPrintUpFront worksheet

❖ **Annual** – Establishment VC annualized over PR stand life and fixed costs (e.g. equipment depreciation) that last >1 year divide by this useful life of equipment



PRBudPrintShort & PRBudPrintLong worksheets

Upfront vs Annualized Costs/Acre

Your Farm's
*POLLINATION
RESERVOIR (PR)*

VARIABLE COSTS:
Seed, Seedlings,
Woody Transplants,
Labor for Planting,
Maintenance Mowing

Paid "UPFRONT"
in Year 1 only -
\$10,000/acre

VARIABLE COSTS EVERY YEAR:
Maintenance Mowing

Paid annually every year - \$10/acre/year

VARIABLE COSTS DURING ESTABLISHMENT YEAR 1:
Seed, Seedlings, Woody Transplants, Labor for Planting

Establishment costs paid only during Year 1 are
"ANNUALIZED" over the PR stand life -
\$4,000 seed / 10 year stand life = \$400/acre/year

Year 1

Year 2

Year 5

End of Stand Life

FIXED COSTS:
Equipment & structure depreciation, land, taxes, insurance



Equipment & structures depreciated over useful life of capital (NOT stand life)
If tractor useful life is 30 years, straight-line depreciate tractor over 30 years -
\$40,000 - \$10,000 salvage = \$30,000 / 30-year tractor's useful life = \$1,000/year

Seed / Transplant Assumptions

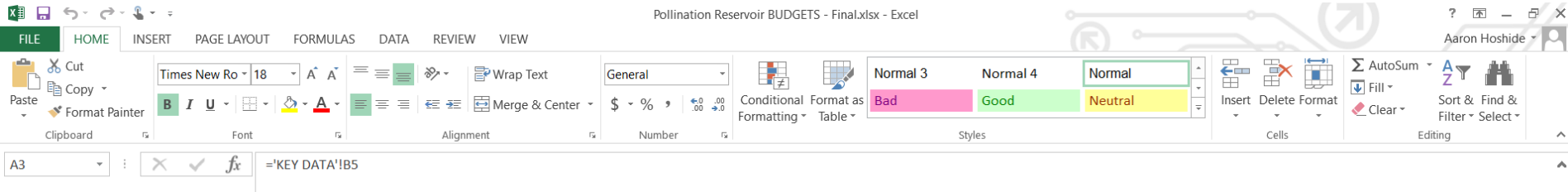
- Can specify by species in mix or use general assumptions for seed / transplant
 - ❖ Seed – General assumptions or by species seeding rate & cost (\$/lb)
 - ❖ Seedling – General assumptions or by species planting density & cost (\$/plant)
 - ❖ Transplants – Woody perennial transplants general or by species transplant density & cost (\$/transplant)

Step-by-Step for Customizing

- Quick version do rapidly using survey questions for **KEY DATA** worksheet
 - ❖ Dimensions (length x width) & stand/woody life
 - ❖ Seed / seedling / transplant planting rate & cost
 - ❖ Establishment method (plastic smother, tillage, Roundup®), tillage type, Poast®, mower type
 - ❖ Land value & taxes
- For customization of variable & fixed costs, make line item changes in light green highlighted cells in **POLLIN-**
ATION RESERVOIR budget worksheet



Annual Pollination Reservoir Budget



Enterprise Name:	POLLINATION RESERVOIR	S/S Selected:	0	0.164 Acres PP	1%	Percent used for Strip	3,500 lb/cord											
Name:	POLLINATION RESERVOIR	WT Selected:	0	0.000 Acres Natural	hour	Time unit	\$15.00	Wage rate	Length	84.62	208.71	feet						
Pollination Reservoir			0	0.000 Acres Clover	gallon	Fuel unit	\$2.50	Fuel price	Width	84.62	208.71	feet						
				0.000 Acres Wildflower					Area	7,160	43,560	square feet						
		Acre=0 Lb=1	Sq.Ft.=0 W=1	1.000 Acres Woody Transplants					Input	Yield/Quant.	Yield/Quant.							
		0	0	1.164 Acres Total					0	0	0							
		\$/acre	\$/1000 sq.ft.	\$0,720	\$q.Ft. Total				0	0	0							
Annual Revenue	\$0	\$0.00	\$0.00	Quantity	Unit	Quantity	Unit	Price	/unit	Yield/Acre	Quant./Plot	Min	Max	Establish System	%			
Value-Added Sales (Unown)	\$0	\$0.00	\$0.00	0	?	0	lb	\$0.00	/?	0	0	-	-	Plastic				
Value-Added Sales (Clover)	\$0	\$0.00	\$0.00	0	?	0	lb	\$0.00	/?	0	0	-	-	Tilled				
Value-Added Sales (Wildflower)	\$0	\$0.00	\$0.00	0	?	0	lb	\$0.00	/?	0	0	-	-	Roundup				
Value-Added Sales (?)	\$0	\$0.00	\$0.00	0	?	0	lb	\$0.00	/?	0	0	-	-	TOTAL				
Other Sales (?)	\$0	\$0.00	\$0.00	0	?	0	lb	\$0.00	/?	0	0	-	-					
				0	lb	0	lb	\$0.00	/?	0	0	-	-					
						0	lb	\$0.00	/?	0	1,361			Seedling / Seed				
				Total Input	Input	Unit	Input Price	/unit	Amt/Acre	Apps	Year(s)	Input Q	Input Q	Seedling				
Annual Costs				Quantity	Quantity						Last	Min	Max	Seed				
Annual Variable Costs														Assume				
Planting(s)				Input	Unit	Application	Input Price	/unit	Amt/Acre	Apps	Year(s)	Input Q	Input Q					
Fertilizer				Quantity	Unit	Rate					Last	Min	Max	\$/Acre in Est. Year	Input C			
Chemical/Mineral (?-?-?)	\$0	\$0.00	\$0.00	0	ton	0	\$0.00	/ton	0	0	1	-	-	\$0				
Nitrogen (N)	\$0	\$0.00	\$0.00	0	lb	0	\$0.00	/lb	0	0	1	-	-	\$0				
Phosphorus (P)	\$0	\$0.00	\$0.00	0	lb	0	\$0.00	/lb	0	0	1	-	-	\$0				
Potassium (K)	\$0	\$0.00	\$0.00	0	lb	0	\$0.00	/lb	0	0	1	-	-	\$0				
Compost	\$0	\$0.00	\$0.00	0	ton	0	\$0.00	/ton	0	0	1	-	-	\$0				
Manure	\$0	\$0.00	\$0.00	0	ton	0	\$0.00	/ton	0	0	1	-	-	\$0				
Fungicides/Herbicides/Insecticides				Input Quantity	Unit	Appl. Rate	Input Price	/unit	Amt/Acre	Apps	Yr(s) Last	Min	Max	\$/Acre in Est. Year	Input C			
Fungicide (?)	\$0	\$0.00	\$0.00	0	lb	0	\$0.00	/lb	0	0	1	-	-	\$0				
Herbicide (1st Spray of Roundup)	\$0.88	\$0.76	\$0.02	0.294	gallon	0.25	\$30.00	/gallon	0.25	1	10	-	-	\$8	0			
Herbicide (2nd Spray of Roundup)	\$0.88	\$0.76	\$0.02	0.294	gallon	0.25	\$30.00	/gallon	0.25	1	10	-	-	\$8	0			
Herbicide (3rd Spray of Roundup)	\$0.88	\$0.76	\$0.02	0.294	gallon	0.25	\$30.00	/gallon	0.25	1	10	-	-	\$8	0			
Herbicide (Poast - Crabgrass)	\$0.03	\$0.03	\$0.00	0.04	pint	2	\$7.38	/pint	0.032	1	9	-	-	\$0	0			

“POLLINATION RESERVOIR” budget worksheet

Budget Results – Upfront Costs

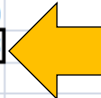
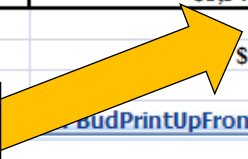
	A	B	C	D	E	F	G	H	I	J
22	Adjuvants	\$0.06		\$0.34		\$0.008				
23	Lime	\$0		\$0		\$0				
24	Seedlings	\$3,483		\$21,189.87		\$486.45				
25	Seed	\$158		\$958.22		\$22.00				
26	Seed Ammendments	\$32		\$195.28		\$4.48				
27	Labor	\$1,329		\$8,083.39		\$185.57				
28	Labor (Other Expenses)	\$0		\$0		\$0				
29	Diesel Fuel and Oil (General)	\$0		\$0		\$0				
30	Diesel Fuel and Oil (Itemized)	\$8		\$48.56		\$1.11				
31	Heating	\$0		\$0		\$0				
32	Maintenance and Upkeep	\$305		\$1,855.56		\$42.60				
33	Miscellaneous									
34	Containers	\$0		\$0		\$0				
35	Custom Hire	\$0		\$0		\$0				
36	Hauling & Trucking	\$0		\$0		\$0				
37	Packaging	\$0		\$0		\$0				
38	Rent or Lease (Equipment)	\$0		\$0		\$0				
39	Rent or Lease (Tiller)	\$0		\$0		\$0				
40	Rent or Lease (Lime Spreader Push)	\$0		\$0		\$0				
41	Rent or Lease (Hand Roller)	\$0		\$0		\$0				
42	Rent or Lease (Land)	\$0		\$0		\$0				
43	Shipping	\$0		\$0		\$0				
44	Storage & Warehousing	\$0		\$0		\$0				
45	Supplies	\$0		\$0		\$0				
46	Utilities	\$0		\$0		\$0				
47	Interest	\$0		\$0		\$0				
48	Total Operating Expenses	\$5,341		\$32,493.57		\$745.95				
49										
50	Total Overhead Expenses	\$0		\$0		\$0				
51										

Total Variable Costs, NOT annualized

Per 1,000 square feet

Total

Per Acre



Budget Results – Annual Costs

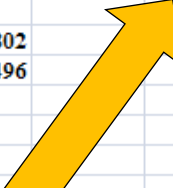
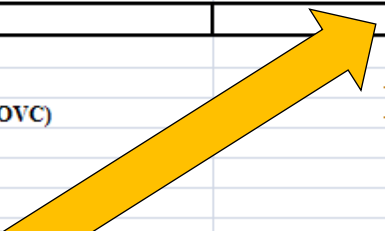
	A	B	C	D	E	F	G	H	I	J
43	Shipping		\$0		\$0		\$0			
44	Storage & Warehousing		\$0		\$0		\$0			
45	Supplies		\$0		\$0		\$0			
46	Utilities		\$0		\$0		\$0			
47	Interest		\$0		\$0		\$0			
48	Total Operating Expenses		\$496		\$3,018.69		\$69.30			
49										
50	Total Overhead Expenses		\$0		\$0		\$0			
51										
52	Annual Ownership Expenses									
53	Depreciation and Interest									
54	Buildings & Structures		\$4		\$25.35		\$0.58			
55	Bee Pasture Equipment		\$155		\$940.59		\$21.59			
56	Tools		\$2		\$12.17		\$0.28			
57	Tractors & Vehicles		\$20		\$121.68		\$2.79			
58	Land		\$82		\$500.00		\$11.48			
59	Interest on Loans		\$0		\$0		\$0			
60	Insurance		\$0		\$0		\$0			
61	Taxes		\$43		\$260.84		\$5.99			
62	Total Ownership Expenses		\$306		\$1,860.62		\$42.71			
63										
64	Total Annual Cost		\$802		\$4,879.30		\$112.01			
65										
66	Net Firm Income (NFI)		-\$802		-\$4,879.30		-\$112.01			
67	Return over Variable Cost (ROVC)		-\$496		-\$3,018.69		-\$69.30			
68										
69	Performance Measures									
70	Break-even Revenue				\$/acre		\$/1,000 sq.ft.			
71	Long-run to Cover All Costs				\$4,879.30		\$112.01			
72	Short-run to Cover All Costs				\$3,018.69		\$69.30			

**Total =
Variable +
Fixed Costs,
Annualized**

**Per 1,000
square
feet**

Total

Per Acre



Pollination Reservoir Upfront VC

➤ Natural Regeneration =
\$102/acre = \$2.34/1,000 sq.ft.



➤ ME wild BB pollination reservoir w/ ↓
seed rate = \$7,693/acre

➤ UNH pollination reservoir all seed =
❖ \$9,865/acre



Straw Mulch
add \$700/acre

➤ UNH all seedling =
❖ \$22,506/acre (1 seedling/4 sq.ft.)
❖ \$37,706/acre (1 seedling/2 sq.ft.)
❖ \$69,107/acre (1 seedling/1 sq.ft.)



Pollination Reservoir Annual Costs

➤ Natural Regeneration = Yearly fall mow (\$102/acre) + fixed costs (\$98/acre) = **\$200/acre**

➤ ME wild BB pollination reservoir w/ ↓
seed rate = **\$800-\$1,200/acre** (3-5 yr. stand life)

➤ UNH pollination reservoir all seed =



❖ **\$1,190/acre** (10 year stand life)

❖ **\$1,799/acre** (5 year stand life)

**Straw Mulch VC
add \$70-\$140/acre
(5-10 year stand life)**

➤ UNH all seedling =



❖ **\$2,451-\$4,261/acre** (5-10 yr. stand life @ 1 seedling/4 sq.ft.)

❖ **\$3,972-\$7,301/acre** (5-10 yr. stand life @ 1 seedling/2 sq.ft.)

❖ **\$7,012-\$13,381/acre** (5-10 yr. stand life @ 1 seedling/1 sq.ft.)

Woody Transplant Upfront Costs

- Upfront Costs =
\$12,819-\$48,756/acre =
\$294.29-\$1,119.29/1,000 sq.ft.

Planting Density sq.ft./transplant	Year 1
25	\$48,756
50	\$24,798
100	\$12,819



Pollinator Habitat

This area has been planted with pollinator-friendly flowers and is protected from pesticides to provide valuable habitat for bees and other pollinators.

To learn how you can help to bring back the pollinators, please visit www.xerces.org.



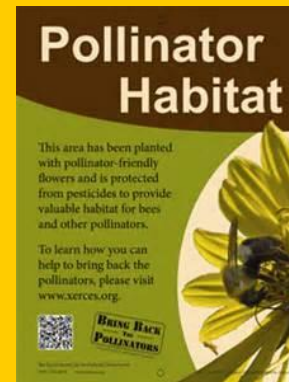
BRING BACK
the
POLLINATORS



Woody Transplant Annual Costs

➤ Annual Costs (\$/acre) =
\$1,049-\$3,947/acre = \$24.08-\$90.61/1,000 sq.ft.

Planting Density sq.ft./transplant	Life of Woody Perennial Planting		
	10 years	25 years	50 years
25	\$3,947	\$2,116	\$1,506
50	\$2,422	\$1,506	\$1,201
100	\$1,660	\$1,201	\$1,049



Recommendations

- **Small scales affordable - \$5-30/100 sq.ft.**
- **Larger scales need to “economize”**
 - ❖ **Seed cheaper but control weeds establishment year**
 - ❖ **Seedling more expensive but good supplement**
 - ❖ **Woody transplants economical since longer life**
 - ❖ **Match seed / seedling / transplants / natural regeneration to surrounding landscape**
 - ❖ **Weed out invasive weeds to extend stand life**
 - ❖ **Economize *seed* (~20% VC), *woodies* (~25-50% VC), and *seedlings* (~90% VC)**
 - ❖ **Match establishment method w/ system**
(Ex: conventional ME wild BB use Roundup® while CT vegi use tillage)

Paper Survey → Excel Cost Estimate

Please enter the following information into the highlighted cells to customize your pollinator planting/pasture:

Farm Name:

Assumed Wage Rate:

\$ /hour

**Assume
fuel =
\$2.50/gal**

1) Please enter the area of your pollinator pasture and/or woody transplants by defining length and width of the planted area:

Pasture Length = feet

Transplant Length = feet

Pasture Width = feet

Transplant Width = feet

2) Please enter expected stand life of your planting (years before you have to re-plant) for: PASTURE WOODY PERENNIAL TRANSPLANTS

year(s)

year(s)

3) Please specify if you are using the detailed "SEED-SEEDLING-WOODY Selection" worksheet: SEEDLINGS WOODY TRANSPLANTS

0 (Default = NO = 0)

0 (Default = NO = 0)

4) Please specify if you are using a sod cutter during establishment:

0 (Default = NO = 0)

5) Please specify what % of planted area uses "seedling" versus "seed" plus planting rate & cost per unit:

Seedling %

Seedling

Seed %

sq.ft./seedling



Questions? Discussion!



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THE
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