TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

ECONOMICS NO. CA-1 — September 1985

TECHNIQUES FOR EVALUATING CONSERVATION PRACTICES COSTS

When farm economic conditions are depressed, it is more difficult to "sell" needed soil and water conservation practices. Most growers and producers obtain production loans to finance annual operating expenses and need good cost estimates to present to their banker. Good cost estimates also allow a review of the tax consequences of proposed expenditures.

Conservationists - like all salespersons - must know the benefits of each practice because this is what triggers a decision. The product/practice is sold on its merits as it effects that individual grower or producer. Tools for presenting cost data and benefits are needed in each conservationist's tool kit-called a "Thunder Book" or "SECTION VI" of the Field Office Technical Guide.

Enclosed is a starter set of practice fill-in cost sheets and benefits checklists for the following ten practices:

- 324-Chiseling
- 324-Subsoiling
- 340-Cover and Gren Manure Crop
- 342-Critical Area Planting-roadside
- 342-Critical Area Planting-gully
- 344-Crop Residue Use
- 380/392-Farmstead & Feedlot Windbreak or Field Windbreak
- 512-Pasture Planting
- 550-Range Seeding-w/ fertilizer
- 550-Range Seeding-w/o fertilizer

Corresponding cost sheets with filled-in cost data are being issued via a Technical Guide Notice. They are called "California typical examples" and will be filed or referenced in SECTION V-A-3. It is intended that field offices will convert these "California Examples" into "County Examples" or "Field Office Examples" as time permits by using local cost data. The "California Examples" can be discarded as local examples are developed.

The Fill-in cost sheets and the Example cost sheets are both suitable for helping growers and producers estimate costs. Depending on the situation, one sheet may be more usefull than the other. When using the Example cost sheet, make pen and ink word changes to fit the site and show the results in the "Site Revised Costs" column. When using the Fill-in cost sheet, the "Typical Costs" column may be used to show cost data from your local Example. Complete the rest of the cost sheet during your conference in the field showing results in the last column. Give a copy to the grower or producer after making a copy if needed. You will want to accumulate different examples in your "Thunder Book" and in SECTION V-A-3 of the Field Office Technical Guide.

The following cost accounting techniques will help you use the cost sheets. Follow the same format when developing additional cost sheets.

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In order to accurately complete the conservation practices cost sheets, certain aspects of cost accounting need to be understood. Following is a short description of terms used on the cost sheets, with examples of how these techniques are applied to various types of projects.

INTEREST: Interest can be thought of as economic rent of money. When money is borrowed, the amount borrowed must be repaid along with a use charge called interest. Or, said another way, interest is money paid for the use of money. The appropriate rate of interest will depend upon the situation or the reason for the analysis. In the case of the conservation practices cost sheets, a 12.25% interest rate is used. This is the loan rate used by the Production Credit Association.

ANNUITY: Annuity is a series of equal payments made at equal intervals of time. The most common type of annuity is our paychecks, at least those that meet the equal payment requirement. Annuity may be a benefit (to those receiving equal sums of money) or a cost (to those making the payment).

AMORTIZATION: Amortization is sometimes called partial payment or capital recovery factor. This factor will convert initial cost to annual cost. It will determine what annual payment including interest must be made to pay off the initial cost over a given number of years.

PRESENT VALUE: Present value can be thought of as what $1.00 due in the future is worth today or at present. The present value of a specified single sum of money due at some named future date is that sum of money which, if put at compound interest for the same time period, would have a compound amount equal to the specified amount. Hence, this is the reason for the factor being occasionally called the "discount factor."

The above techniques are used to assess all project costs on the same basis (usually a present value basis). Once all costs have been brought back to a present value basis, the costs are spread (amortized) over the life of the project in order to get an average annual cost. Following are examples of four types of conservation practice costs.

Conservation Practice with 1-Year Life, Installation Costs, No Maintenance Costs: Since installation costs occur at the beginning of the project, they are already in present value terms and no adjustments need to be made. Also, since the expected life of the project is only one year, costs need not be spread over a period of time to get an annual average cost.
For example, if a practice costs $1,000 to install, and has no maintenance costs, the average annual cost of the practice would also be $1,000.

Conservation Practice with Multi-Year Life, Installation Costs, No Maintenance Costs: Again, installation costs are already in present value terms. But, since the life of the project is more than one year, installation costs must be spread over the life of the practice in order to get average annual cost. This is done by using an amortization factor that corresponds to the appropriate interest rate and practice life.
For example, if a practice costs $1,000 to install and lasts for 10 years, the $1,000 must be amortized over a 10-year period. In our case, we would use an amortization factor corresponding to a 12.25% interest rate, and a 10-year practice life (see "Compound Interest and Annuity Tables for 12.25 Percent"). This would be $1,000 X 0.17880=$178.80. This would be the average annual cost of the practice.

Conservation Practice with Multi-Year Life, Installation Costs, Annual Maintenance Costs: Now, with maintenance costs, all costs must be put in present value terms before they are spread over the life of the project. Installation costs are already in present value terms, but maintenance costs are not. This is because maintenance costs do not occur at the beginning of the practice, but occur in the future. In this case, we are assuming that maintenance costs occur once a year, every year of the life of the practice, and are the same amount each year. Because of this, these costs are an annuity and can be put in present value terms by using the present value factor corresponding to the "Present Value of an Annuity of 1 Per Year" (see table). For example, a project has an installation cost of $1,000, annual maintenance costs of $100, and an expected life of 10 years. First, maintenance costs must be put in present value terms. This is done by multiplying $100 by the present value factor of an annuity for a 10-year practice: $100 X 5.59287=$559.29. Now, with installation and maintenance costs in present value terms, costs can be spread, or amortized, over the life of the project. This would be ($1,000 X 0.17880) + ($559.29 X 0.17880)=$278.80. This would be the average annual cost of the practice.

Conservation Practice with Multi-Year Life, Installation Costs, Periodic Maintenance Costs: In this case, maintenance costs do not occur annually, but occur during specific years over the life of the practice. Because these costs do not occur annually, they can not be thought of as an annuity. Therefore, a different present value factor must be used for each year that maintenance costs occur. The appropriate present value factor can be found under the "Present Value of 1" column in the table.
For example, a project has an installation cost of $1,000, with maintenance costs of $200 occuring in year 4, and $100 occuring in year 8, with an expected life of 10 years. First, the maintenance costs must be put in present value terms. The maintenance in year 4 has a corresponding "present value of 1" factor of 0.62988, and the maintenance in year 8 has a factor of 0.39674 (see table). So, the present value of maintenance costs would be: ($200 X 0.62988) + ($100 X 0.39674)=$165.65. Now, with installation and maintenance costs in present value terms, costs can be amortized over the 10-year life of the practice: ($1,000 X 0.17880) + ($165.65 X 0.17880)=$208.42. This would be the average annual cost of the practice.

COMPOUND INTEREST AND ANNUITY TABLES FOR
12.2500 PERCENT

NO. OF YRS. HENCE	PRESENT VALUE OF 1	AMORTI-ZATION	PRESENT VALUE OF AN ANNUITY OF 1 PER YEAR	AMOUNT OF AN ANNUITY OF 1 PER YEAR	PRESENT VALUE OF AN INCREASING ANNUITY	PRESENT VALUE OF A DECREASING ANNUITY
1	.89087	1.12250	.89087	1.00000	.89087	.89087
2	.79365	.59364	1.68452	2.12250	2.47816	2.57538
3	.70704	.41814	2.39155	3.38251	4.59927	4.96693
4	.62988	.33097	3.02143	4.79686	7.11877	7.98836
5	.56114	.27913	3.58256	6.38448	9.92445	11.57092
6	.49990	.24495	4.08246	8.16658	12.92384	15.65338
7	.44534	.22086	4.52780	10.16698	16.04125	20.18119
8	.39674	.20306	4.92455	12.41244	19.21519	25.10573
9	.35345	.18947	5.27799	14.93296	22.39620	30.38373
10	.31487	.17880	5.59287	17.76225	25.54494	35.97660
11	.28051	.17026	5.87338	20.93813	28.63057	41.84997
12	.24990	.16331	6.12328	24.50305	31.62935	47.97325
13	.22263	.15758	6.34590	28.50467	34.52350	54.31915
14	.19833	.15281	6.54423	32.99649	37.30013	60.86339
15	.17669	.14879	6.72092	38.03856	39.95044	67.58431
16	.15740	.14538	6.87833	43.69829	42.46892	74.46264
17	.14023	.14248	7.01855	50.05133	44.85278	81.48119
18	.12492	.13999	7.14348	57.18261	47.10141	88.62467
19	.11129	.13784	7.25477	65.18748	49.21594	95.87944
20	.09915	.13598	7.35391	74.17295	51.19885	103.23335
21	.08833	.13437	7.44224	84.25914	53.05369	110.67559
22	.07869	.13296	7.52093	95.58088	54.78479	118.19652
23	.07010	.13173	7.59103	108.28954	56.39707	125.78754
24	.06245	.13066	7.65348	122.55501	57.89586	133.44102
25	.05563	.12972	7.70911	138.56800	59.28671	141.15013
26	.04956	.12889	7.75867	156.54258	60.57534	148.90880
27	.04415	.12816	7.80283	176.71904	61.76749	156.71163
28	.03934	.12752	7.84216	199.36712	62.86888	164.55379
29	.03504	.12695	7.87720	224.78960	63.88512	172.43099
30	.03122	.12645	7.90842	253.32632	64.82167	180.33941
31	.02781	.12600	7.93623	285.35880	65.68382	188.27565
32	.02478	.12561	7.96101	321.31525	66.47666	196.23666
33	.02207	.12526	7.98308	361.67637	67.20505	204.21974
34	.01966	.12496	8.00275	406.98172	67.87362	212.22248
35	.01752	.12468	8.02026	457.83698	68.48674	220.24275
36	.01561	.12444	8.03587	514.92202	69.04855	228.27862
37	.01390	.12423	8.04977	578.99996	69.56296	236.32839
38	.01239	.12404	8.06216	650.92746	70.03361	244.39055
39	.01103	.12387	8.07319	731.66607	70.46394	252.46374
40	.00983	.12372	8.08302	822.29517	70.85713	260.54676
41	.00876	.12358	8.09178	924.02632	71.21617	268.63854
42	.00780	.12346	8.09958	1038.21955	71.54383	276.73812
43	.00695	.12336	8.10653	1166.40144	71.84268	284.84465
44	.00619	.12326	8.11272	1310.28562	72.11511	292.95737
45	.00552	.12318	8.11824	1471.79561	72.36333	301.07561
46	.00491	.12310	8.12315	1653.09057	72.58937	309.19876
47	.00438	.12304	8.12753	1856.59416	72.79512	317.32629
48	.00390	.12298	8.13143	2085.02695	72.98231	325.45772
49	.00347	.12293	8.13490	2341.44275	73.15255	333.59262
50	.00310	.12288	8.13800	2629.26949	73.30731	341.73062

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : CHISELING [CHISELING AND SUBSOILING] [324]

SUB-SYSTEM : Soil Management

EXPECTED LIFE: 1 year

SELECTED JOB : Ripping _____ inches deep on __ foot centers in ____ direction(s) on _____ acre field.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Rip using _____ w/__ chisel points: _____ ac @ ___ ac/hr = ___ hrs @$___ /hr x ___ time(s)	$_____	$_____
Cost per ___ acres	$.....	$.....
Cost per acre (rounded) . . .	$.....	$.....
ANNUAL MAINTENANCE		
None		
AVERAGE ANNUAL COST		
Installation Cost	$.....	$.....
Annual Maintenance Cost	None	_____
Average annual cost, per __ acres	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.

b/ _____ _____ _____ _____

Cooperator | Case File No. | Technician | Date

PRACTICE: CHISELING
Selected Job: Ripping 12 to 16-inches deep on 2 foot center in one direction.

Following is a list of benefits that may accrue to the project area after the installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Increases the infiltration of water.

____ 2. Allows for better rooting depth and penetration.

____ 3. Allows for a more uniform crop stand that may lead to higher yields.

____ 4. Decreases water runoff and ponding.

____ 5. Decreases soil erosion.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVAITON SERVICE

PRACTICE : SUBSOILING [CHISELING AND SUBSOILING] [324]

SUB-SYSTEM : Soil Management

EXPECTED LIFE: 3 years

SELECTED JOB : Ripping _____ inches deep on ____ foot centers in ___ direction(s) on _____ acre field.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Rip using a _____ pulling __ shanks: ___ ac @ ___ ac/hr = ____ hrs @$___ /hr x ___ time(s)	$_____	$_____
Cost per __ acres	$.....	$.....
Cost per acre (rounded)	$.....	$.....
ANNUAL MAINTENANCE		
None		
AVERAGE ANNUAL COST		
Amortization factor for _____ %, 3 years = 0._____		
Installation cost ($_____ x 0._____)	$.....	$.....
Annual Maintenance Cost	None	_____
Average annual cost, per ___ acres	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator Case File No. Technician Date

PRACTICE: SUBSOILING
Selected Job: Ripping 20 to 36-inches deep on 2 to 3 foot centers in two directions.

Following is a list of benefits that may accrue to the project area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Increases the infiltration of water.

____ 2. Allows for better rooting depth and penetration.

____ 3. Allows for a more uniform stand that may lead to higher yields.

____ 4. Decreases water runoff and ponding.

____ 5. Decreases soil erosion.

____ 6. Allows for the drainage of a seasonally perched water table.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : COVER AND GREEN MANURE CROP [340]

SUB-SYSTEM : Soil Management

EXPECTED LIFE: 1 year

SELECTED JOB : Establish __ foot strips of _____ in __ acre _____orchard planted on ___ ft x __ ft _____ =_____ tree rows. _____ strips x [___ ft x ___ft = _____ ac/strip] = _____ acres

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Disk w/_____ w/__ ft _____ disk and _____ harrow: ___ ac @ ___ ac/hr = ____ hrs @$___ /hr x ___ time(s)	$.....	$.....
Fertilizer: ___ lbs N/ac using _____ = ____ lbs/ac x ___ ac = _____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Drill seed and fertilizer w/_____ w/__ ft _____ drill and spreader: ___ ac @ ___ ac/hr = ____ hrs @$___ /hr	.....	.....
Disk under cover crop w/_____ w/___ ft _____ disk: ___ ac @ ___ ac/hr = ____ hrs @$___ /hr x __ time(s)	_____	_____
Cost per __ acres	$.....	$.....
Cost per acre (rounded).	$.....	$.....
ANNUAL MAINTENANCE		
None		
AVERAGE ANNUAL COST		
Installation Cost.	$.....	$.....
Annual Maintenance Cost.	None	_____
Average annual cost, per __ acres.	$.....	$.....
Average annual cost, per acre (rounded)	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.

b/ _____ _____ _____ _____

Cooperator | Case File No. | Technician | Date

PRACTICE: COVER AND GREEN MANURE CROP
Selected Job: Establish strips of barley in a walnut orchard.

Following is a list of benefits that may accrue to the project area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Decreases soil erosion.

____ 2. Helps to control dust.

____ 3. Increases the infiltration of water.

____ 4. Improves wildlife habitat by providing food and cover.

____ 5. Decreases soil compaction.

____ 6. Increases soil fertility and tilth.

____ 7. Increases the population of beneficial pest predators.

____ 8. Promotes soil microbial life.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : CRITICAL AREA PLANTING [342]

SUB-SYSTEM : Erosion Control

EXPECTED LIFE: 30 years

SELECTED JOB : Establish _____ cover on ____ acre(s) roadside erosion or rural residential erosion site.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Labor to hand grade and harrow : ___ hrs/ac x ___ ac = ____ hrs @$____ /hr	$.....	$.....
Fertilizer: ____ lbs N/ac using _____ = ____ lbs/ac x ___ ac = ____ lbs @$_____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Grain straw : 2 tons/ac x ____ ac = _____ ton(s) @ $_____/ton	.....	.....
Labor to spread fertilizer, seed and mulch including travel : ___ hrs/ac x ___ ac = ____ hrs @$____ /hr . .	.....	.....
Pickup truck : ___ hrs. @ $____ /hr	_____	_____
Cost per ____ acres . . .	$.....	$.....
Cost per acre (rounded) . .	$.....	$.....
MAINTENANCE		
Fertilizer: ___ lbs N/ac every other year using _____ = ___ lbs/ac x ___ ac = ____ lbs @$____ /lb	$.....	$.....
Labor to spread fertilizer including travel: ____ hrs/ac x ___ ac = ____ hrs @$_____ /hr	.....	.....
Pickup truck : ___ hrs. @ $____ /hr	_____	_____
Biannual cost, per _____ acres	$.....	$.....
Annual cost, per _____ acres	$.....	$.....
Present value of total project maintenance costs, per _____ acres = $_____ x _____	$.....	$.....

***CONTINUED ON NEXT PAGE ***

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator Case File No. Technician Date

	TYPICAL COSTS a/	SITE REVIS COSTS
AVERAGE ANNUAL COST		
Amortization factor for ____ %, 30 years = 0._____		
Installation cost ($_____ x 0._____)	$.....	$.....
Maintenance cost (PV) ($_____ x 0._____).	_____	_____
Average annual cost, per ____ acres . . .	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

PRACTICE: CRITICAL AREA PLANTING
Selected Job: Establish grass cover on a roadside or rural residential erosion site.

Following is a list of benefits that may accrue to the project area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Improves downstream conditions by decreasing sedimentation.

____ 2. Decreases maintenance of roadside and residential sites.

____ 3. Decreases the danger caused by eroded holes and sediment on roads.

____ 4. Improves the visual quality of the area.

____ 5. Preserves the residential site land value.

____ 6. Decreases the danger of damage to structures such as houses, roads, bridges, etc.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : CRITICAL AREA PLANTING [342]

SUB-SYSTEM : Erosion Control

EXPECTED LIFE: 10 years

SELECTED JOB : Treat gully ___ feet long averaging ___ feet wide x ___ feet deep.
Banks shaped to ___:1 side slopes. Area planted = ____ acres.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Move-in and idle time, _____ : ___ hrs @$___ /hr . .	$.....	$.....
Shape w/ _____ : ___ ft @ ___ ft/hr = ____ hrs @$___ /hr	.....	.....
Disk w/_____ w/__ ft _____ disk and _____ harrow: ___ ac @ ____ ac/hr =____ hrs @$____ /hr	.....	.....
Fertilizer: ____ lbs N/ac using _____ = _____ lbs/ac x ____ ac = ____ lbs @$___ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Grain straw : 2 tons/ac x ___ ac = ___ tons @$___ /ton	.....	.....
Labor to fertilize, seed, mulch including travel: ___ hrs/ac x ___ ac = ___ hrs @$_____ /hr	.....	.....
Pickup truck : ___ hrs @ $___ /hr	.....	.....
Anchor mulch w/_____w/____ ft _____ disk set straight: ___ ac @ ___ ac/hr = ____ hrs @$___ /hr	_____	_____
Cost per gully.	$.....	$.....
Cost per acre (rounded) . .	$.....	$.....

*** CONTINUED ON NEXT PAGE ***

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator Case File No. Technician Date

	TYPICAL COSTS a/	SITE REVIS COSTS
MAINTENANCE		
Fertilizer: ___ lbs N/ac every other year using _____ = ___ lbs/ac x ___ ac = ___ lbs @$____ /lb	$.....	$.....
Labor to spread fertilizer including travel: ____ hrs/ac x ___ ac = ____ hrs @$____ /hr	.....	....
Pickup truck : ___ hrs @ $____ /hr	_____	_____
Biannual cost per gully	$.....	$.....
Present value of total project maintenance costs, per gully		
(Yr 2: $____ x .____) + (Yr 4: $____ x .____) + (Yr 6: $____ x .____) + (Yr 8: $____ x .____). . . .	$.....	$.....
AVERAGE ANNUAL COST		
Amortization factor for ____ %, 10 years = 0.____		
Installation cost ($____ x 0.____)	$.....	$.....
Maintenance cost (PV) ($____ x 0.____)	_____	_____
Average annual cost, per gully(rounded). .	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

PRACTICE: CRITICAL AREA PLANTING
Selected Job: Seed an erodible gully.

Following is a list of benefits that may accrue to the project area after the installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Decreases soil erosion.

____ 2. Decreases downstream sedimentation damage to ditches, reservoirs, fish habitat, etc.

____ 3. Improves wildlife habitat by providing food and cover.

____ 4. Improves the visual quality of the area.

____ 5. Prevents the lowering of the water table around the edge of large gully.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : CROP RESIDUE USE [344]

SUB-SYSTEM : Soil Management

EXPECTED LIFE: 1 year

SELECTED JOB : Incorporate _____ residues on _____ acres.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Disk using _____ w/___ft _____ disk: ___ ac @ ___ ac/hr = ___ hrs @$___ /hr x __ time(s)	$.....	$.....
Fertilizer: ___ lbs N/ac using _____ = ____ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Apply fertilizer using _____ w/___ ft spreader: ____ ac @ ___ ac/hr = ____ hrs @$____ /hr	_____	_____
Cost per _____ acres . . .	$.....	$.....
Cost per acre (rounded). .	$.....	$.....
ANNUAL MAINTENANCE		
None		
AVERAGE ANNUAL COST		
Installation Cost.	$.....	$.....
Annual Maintenance Cost	None	_____
Average annual cost, per ___ acres	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.

b/ _____ _____ _____ _____

Cooperator | Case File No. | Technician | Date

PRACTICE: CROP RESIDUE USE
Selected Job: Incorporate small grain residues.

Following is a list of benefits that may accrue to the project area after the installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Increases cover leading to the better retention of soil moisture.

____ 2. Decreases soil erosion.

____ 3. Improves soil tilth by adding organic matter which holds moisture and provides for a more uniform seedbed.

____ 4. Improves wildlife habitat by providing food and cover.

____ 5. Increases the infiltration of water.

____ 6. Helps to breakdown, or neutralize, pesticides.

____ 7. Promotes soil microbial life.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : FARMSTEAD & FEEDLOT WINDBREAK (AC) [380]
FIELD WINDBREAK (LN. FT.) [392]

SUB-SYSTEM : Soil Management and Erosion Control

EXPECTED LIFE: 30 years

SELECTED JOB : Establish a single row of trees with a drip irrigation system, completely fenced, with irrigation needed throughout life of the windbreak. Land occupied is __ feet wide and ____ feet long = ____ acres.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Ground Preparation		
Disk w/_____ w/__ ft _____ disk and __ ft _____ harrow:		
___ ac @ ___ ac/hr = ___ hrs @$____ /hr	$.....	$.....
Chemical spray plus needed followup spray for weed control prior to planting: ___ ac @$_____ /ac . . .	.....	.....
Fencing		
High tensile, __ strand, fence both sides, 2 x ____ mi = ____ mi @$_____ /mile	.....	.....
Tree Planting		
$____ /tree + $____ to plant = $____ /tree x ____ trees + ___ extra trees @ $_____	.....	.....
Replanting mortality loss for 3 years, 10% per year in years 1,2,3 = ___ trees/yr @ $____ /tree including readjusting vexar tubes discounted to Present Value: (Yr 1 = $___ x ._____) + (Yr 2 = $___ x ._____) + (Yr 3 = $___ x ._____)	.....	.....
Followup with herbicide spray for weed control @$_____ /tree x ___ trees for years 1, 2, & 3 discounted to present value: (Yr 1 = $___ x ._____) + (Yr 2 = $___ x ._____) + (Yr 3 = $___ x ._____)	.....	.....
Vexar tubing: ($____ /tube + $____ labor) x ____ trees	.....	.....
Trickle irrigation system installed by cooperator @ $_____ /tree x _____ trees	.....	.....
Irrigation costs (water only) ____ acre feet @ $___ /ac ft	_____	_____
Cost per ____ acres	$.....	$.....
Cost per acre (rounded)	$.....	$.....
Cost per linear foot	$.....	$.....

*** CONTINUED ON NEXT PAGE ***

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator Case File No. Technician Date

	TYPICAL COSTS a/	SITE REVIS' COSTS
ANNUAL MAINTENANCE		
Disk Isolation Strip w/_____ w/__ ft _____ disk and __ ft _____ harrow: ____ ac @ ____ ac/hr = ___ hrs @ $___ /hr	$.....	$.....
Irrigation water costs: ___ ac ft/yr @$___ /ac ft . . .	_____	_____
Cost per ___ acres	$.....	$.....
Cost per acre (rounded)	$.....	$.....
Cost per linear foot	$.....	$.....
Present value of total project maintenance costs,		
per ___ acres = $_____ x _____ . . .	$.....	$.....
per acre (rounded)	$.....	$.....
per linear foot	$.....	$.....
AVERAGE ANNUAL COST		
Amortization factor for ____%, 30 years = 0._____		
Installation cost ($_____ x 0._____)	$.....	$.....
Maintenance cost (PV) ($_____ x 0._____) . . .	_____	_____
Average annual cost, per ___ acres . . .	$.....	$.....
Average annual cost, per acre (rounded)	$.....	$.....
Average annual cost, per linear foot . .	$.....	$.....

PRACTICE: FARMSTEAD & FEEDLOT WINDBREAK/FIELD WINDBREAK
Selected Job: Establish a single row of trees with a drip irrigation system, completely fenced, with irrigation needed throughout the life or the practice.

Following is a list of benefits that may accrue to the pfoject area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Reduces the blowing and eroding of soils.

____ 2. Reduces wind around homes, barns, and other buildings.

____ 3. Protects field crops from shattering and lodging, and tree crops from wind-whipping and scarring. Leads to higher crop yields.

____ 4. Reduces evapotranspiration and improves efficiency of crop water useage.

____ 5. Helps to conserve soil moisture.

____ 6. Protects livestock from the effects of harsh environmental conditions. Decreases livestock need for feed in the winter and water in the summer.

____ 7. Produces secondary farm products such as timber, firewood, fence posts, etc.

____ 8. Creates a habitat for beneficial insects, promoting biological control of pest insects in adjoining croplands.

____ 9. Provides cover, nesting sites, and feeding grounds for wildlife.

____10. Reduces pesticide pollution from crop areas, and odor pollution from feedlots.

____11. Decreases the cost of heating and air conditioning farm buildings.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : PASTURE PLANTING [512]

SUB-SYSTEM : Pasture Management

EXPECTED LIFE: ___ years

SELECTED JOB : Seed ___ acres to improved forage species during small grain-pasture-pasture cropping sequence.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Disk w/_____ w/___ ft _____ disk and cultipacker: ___ ac @ ___ ac/hr = ___ hrs @$___ /hr	$.....	$.....
Fertilizer:____ lbs N/ac using _____ = _____ lbs/ac x ___ ac = ____ lbs @$____/lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Drill seed and fertilizer w/_____ w/__ ft _____ drill, fertilizer spreader and cultipacker : ____ ac @ ___ ac/hr = ____ hrs @$___ /hr	_____	_____
Cost per __ acres	$.....	$.....
Cost per acre (rounded) .	$.....	$.....
ANNUAL MAINTENANCE		
None		
AVERAGE ANNUAL COST		
Amortization factor for ___ %, ___ years = 0._____		
Installation Cost ($_____ x 0._____)	$.....	$.....
Annual maintenance costs	None	_____
Average annual cost,per ___ acres	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator | Case File No. | Technician | Date

PRACTICE: PASTURE PLANTING
Selected Job: Seed cropland to improve forage production during a cropping sequence.

Following is a list of benefits that may accrue to the project area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Increases quantity of forage for livestock and wildlife.

____ 2. Improves quality of forage.

____ 3. Improves soil cover leading to better tilth and soil moisture holding quality, and decreases soil erosion.

____ 4. Extends the livestock grazing season.

____ 5. Improves the visual quality of rangeland.

____ 6. Improves fertility by adding nitrogen to the soil.

US DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PRACTICE : RANGE SEEDING (AC) [550]

SUB-SYSTEM : Soil Management and Erosion Control

EXPECTED LIFE: __ Years

SELECTED JOB : Establish _____ clover by drilling seed and fertilizer on ___ acre field.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Fertilizer: ___ lbs P_2O_5/ac using _____ = _____ lbs/ac x ____ ac = ____ lbs @$___ /lb	$.....	$.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Drill seed and fertilizer w/_____ w/__ ft _____ drill: ____ ac @ ____ ac/hr = ____ hrs @$___ /hr	_____	_____
Cost per ____ acres	$.....	$.....
Cost per acre (rounded)	$.....	$.....
MAINTENANCE		
Fertilizer: ___ lbs P_2O_5/ac every third year using _____ = _____ lbs/ac x ____ ac = ____ lbs @$___ /lb	$.....	$.....
Apply fertilizer using _____ w/__ ft spreader: ____ ac @ ____ ac/hr = ____ hrs @$___ /hr	_____	_____
Triannual cost, per _____ acres	$.....	$.....
Present value of total project maintenance costs, per __ ac. = (Yr 3: $___ x .____) + (Yr 6: $___ x .____) + (Yr 9: $___ x .____)	$.....	$.....
AVERAGE ANNUAL COST		
Amortization factor for ____ %, __ years = 0.____		
Installation cost ($_____ x 0.____)	$.....	$.....
Maintenance cost (PV) ($_____ x 0.____)	_____	_____
Average annual cost, per ____ acres . . .	$.....	$.....
Average annual cost, per acre (rounded). .	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator | Case File No. | Technician | Date

PRACTICE: RANGE SEEDING
Selected Job: Establish clover mix by site preparation, drilling seed and applying fertilizer.

Following is a list of benefits that may accrue to the project area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Increases quantity of forage for livestock and wildlife.

____ 2. Improves quality of forage.

____ 3. Improves soil cover leading to better tilth and soil moisture holding quality, and decreases soil erosion.

____ 4. Extends the livestock grazing season.

____ 5. Improves the visual quality of rangeland.

____ 6. Improves fertility by adding nitrogen to the soil.

US DEPARTMENT OF AGRICULTUR
SOIL CONSERVATION SERVICE

PRACTICE : RANGE SEEDING (AC) [550]

SUB-SYSTEM : Soil Management and Erosion Control

EXPECTED LIFE: 25 Years

SELECTED JOB : Establish _____ by preparing seedbed and drilling seed on a _____ acre field.

	TYPICAL COSTS a/	SITE REVISED COSTS b/
INSTALLATION		
Disk w/_____ w/___ ft _____ disk: _____ ac @ ___ ac/hr = ____ hrs @$____ /hr x ___ time(s) . . .	$.....	$.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Seed:_____ @__ lbs/ac x ___ ac = ____ lbs @$____ /lb	.....	.....
Drill w/_____ w/___ ft _____ drill : _____ ac @____ ac/hr = ___ hrs @$____ /hr	_____	_____
Cost per ____ acres . . .	$.....	$.....
Cost per acre (rounded)	$.....	$.....
ANNUAL MAINTENANCE		
None		
AVERAGE ANNUAL COST		
Amortization factor for ____ %, 25 Years = 0. _____		
Installation cost ($_____ x 0._____)	$.....	$.....
Maintenance cost	None	_____
Average annual cost, per ____ acres . . .	$.....	$.....
Average annual cost, per acre (rounded) .	$.....	$.....

a/ _____ , CA typical example; _____ (date) estimates.
Interest rate based on _____ .

b/ _____ _____ _____ _____
Cooperator Case File No. Technician Date

PRACTICE: RANGE SEEDING
Selected Job: Establish site with Pubescent wheatgrass (Luna or Topar) by preparing seedbed and drilling seed.

Following is a list of benefits that may accrue to the project area after installation of the above conservation practice. Please keep in mind that these beneficial effects may not occur in all cases, and are dependent on site-specific variables. The soil conservationist and cooperator should jointly determine the items that do apply to the site.

____ 1. Increases quantity of forage for livestock and wildlife.

____ 2. Improves quality of forage.

____ 3. Improves soil cover leading to better tilth and soil moisture holding quality, and decreases soil erosion.

____ 4. Extends the livestock grazing season.

____ 5. Improves the visual quality of rangeland.