Table 1-1. Count of samples having one or more of coded "frequent" edits[a].

Frequent Edit ID	Description	Samples with 1 or more of this edit
a	Fall tillage prior to survey period	6690
b	Reduce to 2-year rotation	6397
c	Reduce to mono-cropping	2583
d	Add idle or fallow placeholder	1700
e	Fall fertilizer or manure date edit like a.	4034
f	Perennial rotational development needed	1578
g	Bad field operations	95
h	Exclude later rather than early years when reducing rotation	471
i	Keep 3-years since tillage different in 1st and 3rd years	541
j	Change field cult. to row cult. Or vice versa	1023
k	Exclude non-simulated machines	700
l	Keep 3-years due to intended rotation	421
m	Replicate middle year to expand to 4-year rotation	673
n	Add dates for tandem operations	505
o	Add grazing operation	485
p	Resolve split field/mixed crops and management	1104
q	Keep 3-years since manure different in 1st and 3rd years	267
r	Keep 3-years since fertilizer different in 1st and 3rd years	408
s	Fill 5-year rotation per NRI or grass seed	353
t	Model with perennial crops as is since no NRI forage	217
u	Like a. and e. for pesticides	360
y	Miscelaneous date correction	163
z	Team discussion and decision of complex situation	609

[a]Each sample may have more than one edit type, and more than one occurrence of any edit type, e.g., multiple tillage operations in fall prior to reporting period. Updated 12 February 2009.

Table 1-2. Resolution of 2003 and 2004 samples having NASS edit codes indicating missing or incomplete data (analysis 15 Sep 2007).

Set of 806 with "Missing" code						All Samples					
Disq. NRI match	Missing operations disqualify	Edit Status	Sections Missing	sample count	sub-totals	Disq. NRI match	Missing operations disqualify	Edit Status	Sections Missing	sample count	sub-totals
								bad		47	
		done		49				done		8447	
		done	F	152				done	F	152	
		done	FM	3				done	FM	3	
		done	FMP	6				done	FMP	6	
		done	FP	98				done	FP	98	
		done	M	32				done	M	32	
		done	MP	2				done	MP	2	
		done	P	183	525			done	P	183	8923
		fix		11				fix		863	
		fix	F	20				fix	F	20	
		fix	FMP	1				fix	FMP	1	
		fix	FP	6				fix	FP	6	
		fix	M	5				fix	M	5	
		fix	P	27	70			fix	P	27	922
		ok		4				ok		1266	
		ok	F	18				ok	F	18	
		ok	FP	16				ok	FP	16	
		ok	M	4				ok	M	4	
		ok	P	24	28			ok	P	24	1290
	1	bad		95			1	bad		187	
	1	bad	F	9			1	bad	F	9	
	1	Bad	FM	2			1	Bad	FM	2	
	1	bad	FMP	3			1	bad	FMP	3	
	1	bad	FP	20			1	bad	FP	20	
	1	bad	MP	1			1	bad	MP	1	
	1	bad	P	6			1	bad	P	6	
	1	fix		1			1	fix		5	
	1	fix	F	1			1	fix	F	1	
	1	fix	FMP	1			1	fix	FMP	1	
	1	fix	FP	3			1	fix	FP	3	
	1	fix	P	1	143		1	fix	P	1	239
						1		bad		214	
						1		done		597	
						1		fix		537	
						1		fix	F	1	
1		fix	F	1		1		fix	P	1	
1		fix	P	1		1		ok		123	
TOTAL				806						12932	

If "Missing Operations Disqualify" not equal to 1:
F = Fertilizer section only missing
M = Manure section only missing
P = Pesticide section only missing
"- all combinations of FMP

If "Missing Operations Disqualify" = 1, then Field Ops plus that section (s) missing

Table 3-1. Assignment of specie for "other hay" by state and region.

USDA Farm Production Regions	state fips	state	CropID	Full Name
appalachia	21	KY	400	Tall Fescue Hay
appalachia	37	NC	407	Bermuda
appalachia	47	TN	400	Tall Fescue Hay
appalachia	51	VA	414	Orchard grass
appalachia	54	WV	400	Tall Fescue Hay
cornbelt	17	IL	406	Bromegrass
cornbelt	18	IN	406	Bromegrass
cornbelt	19	IA	406	Bromegrass
cornbelt	29	MO	400	Tall Fescue Hay
cornbelt	39	OH	406	Bromegrass
deltastate	5	AR	400	Tall Fescue Hay
deltastate	22	LA	407	Bermuda
deltastate	28	MS	407	Bermuda
lakestate	26	MI	406	Bromegrass
lakestate	27	MN	406	Bromegrass
lakestate	55	WI	406	Bromegrass
mountain	4	AZ	422	Stipa Needlegrass
mountain	8	CO	406	Bromegrass
mountain	16	ID	201	Wheatgrass Crested
mountain	30	MT	406	Bromegrass
mountain	32	NV	422	Stipa Needlegrass
mountain	35	NM	422	Stipa Needlegrass
mountain	49	UT	422	Stipa Needlegrass
mountain	56	WY	201	Wheatgrass Crested
northeast	9	CT	414	Orchard grass
northeast	10	DE	414	Orchard grass
northeast	23	ME	414	Orchard grass
northeast	24	MD	414	Orchard grass
northeast	25	MA	414	Orchard grass
northeast	33	NH	414	Orchard grass
northeast	34	NJ	414	Orchard grass
northeast	36	NY	414	Orchard grass
northeast	42	PA	414	Orchard grass
northeast	44	RI	414	Orchard grass
northeast	50	VT	414	Orchard grass
northplain	20	KS	406	Bromegrass
northplain	31	NE	406	Bromegrass
northplain	38	ND	406	Bromegrass
northplain	46	SD	406	Bromegrass
pacific	6	CA	422	Stipa Needlegrass
pacific	41	OR	414	Orchard grass
pacific	53	WA	414	Orchard grass
southeast	1	AL	407	Bermuda
southeast	12	FL	407	Bermuda
southeast	13	GA	407	Bermuda
southeast	45	SC	407	Bermuda
southplain	40	OK	400	Tall Fescue Hay
southplain	48	TX	407	Bermuda

Table 3-2. Summary of sample counts for the 2004 CEAP-NRI cropland survey (multiple crop).

	Number of samples
One crop only in each year	5,868
Two or more crops in one or more years	898
Total	6,766
Three crops or more in one or more years	88
Confirmed multiple crop samples	84
Confirmed non-multiple crop samples	4
Two crops in one or more years	810
Exempt as determined by programming routine	348*
Confirmed multiple crop samples identified by Rule 1	293
Additional confirmed multiple crop samples identified by Rule 2	18
Confirmed multiple crop samples not identified by rules	2
Confirmed non-multiple crop samples	149
Total confirmed multiple crop samples	397

* 126 were confirmed by examination.

Table 4-1. Re-Assignment of primary tillage operation by depth (inches).

original ID	Assigned ID	Machine	depth	Reported Depth Range low	Reported Depth Range high	use where depth report	Count of operations
1	451	Chisel Plow 6i	6	0	9.99	Y	4,134
1	452	Chisel Plow 12i	12	10	14.99		1,129
1	453	Chisel Plow 15i	15	15	32		107
3	454	Deep Ripper 10i	10	0	12.99	Y	964
3	455	Deep Ripper 16i	16	13	32		740
8	456	Subsoiler 10i	10	0	12.99	Y	1,085
8	457	Subsoiler 18i	18	13	32		480
9	458	Disk-chisel 4i	4	0	6.99	Y	354
9	459	Disk-chisel 8i	4	7	32		794
10	460	Offset Disk-Heavy Disk 6i	6	0	7.99	Y	3,440
10	461	Offset Disk-Heavy Disk 12i	12	8	32		496
43	462	Disk bedder -Hipper 4i	4	0	4.99	Y	515
43	463	Disk bedder -Hipper 6i	6	5	36		205
49	464	Sub-soil Bedder 6i	6	0	10.99	Y	116
49	465	Sub-soil Bedder 15i	15	11	32		134

Table 4-2. Operations defined for chemical and nutrient applications.

Code ID	Type	APEX Name	Additional Description	Reported Method
439	Manure	Man Dry BrdCst Surf	dry broadcast xurface	1
440	Manure	Man Dry BrdCst Inc	dry broadcast incorporated	2
441	Manure	Man Liq BrdCst Surf	liquid broadcast surface	3
442	Manure	Man Liq BrdCst Inc	liquid broadcast incorporated	4
443	Manure	Man Chis Inj Kni	chisel, injected, or knifed	5
444	Manure	Man Fur Basn Irr	furrow or basin irrigation	6
445	Manure	Man Sprinkler Irr	sprinkler irrigation	7
521	Fertilizer	FertBsurf	broadcast surface	1
522	Fertilizer	FertBinc	broadcast incorporated	2
523	Fertilizer	FertBair	broadcast aireal	3
524	Fertilizer	FertSeed	in seed furrow	4
525	Fertilizer	FertIrri	irrigation	5
526	Fertilizer	FertInjK	injected or knifed	6
527	Fertilizer	FertBand	banded	7
528	Fertilizer	FertFoli	foliar	8
529	Fertilizer	FertSpot	spot treatment	9
530	Fertilizer	FTmBsurf	broadcast surface - team adjustment	1
531	Fertilizer	FTmBinc	broadcast incorporated - team adjustment	2
532	Fertilizer	FTmBair	broadcast aireal - team adjustment	3
533	Fertilizer	FTmSeed	in seed furrow - team adjustment	4
534	Fertilizer	FTmIrr	irrigation - team adjustment	5
535	Fertilizer	FTmInjK	injected or knifed - team adjustment	6
536	Fertilizer	FTmBand	banded - team adjustment	7
537	Fertilizer	FTmFoli	foliar - team adjustment	8
538	Fertilizer	FTmSpot	spot treatment - team adjustment	9
539	Manure	Add Man Dry BrdCst Surf	dry broadcast xurface - team adjustment	1
540	Manure	Add Man Dry BrdCst Inc	dry broadcast incorporated - team adjustment	2
541	Manure	Add Man Liq BrdCst Surf	liquid broadcast surface - team adjustment	3
542	Manure	Add Man Liq BrdCst Inc	liquid broadcast incorporated - team adjustment	4
543	Manure	Add Man Chis Inj Kni	chisel, injected, or knifed - team adjustment	5
544	Manure	Add Man Fur Basn Irr	furrow or basin irrigation - team adjustment	6
545	Manure	Add Man Sprinkler Irr	sprinkler irrigation - team adjustment	7
704	Pesticide	Seedfurrow	in seed furrow	4
705	Pesticide	Chemigation	with irrigation	5
706	Pesticide	Chisel/inj/knife	chisel, injected, or knifed	6
708	Pesticide	Directsprayfoliar		8
710	Pesticide	Seedtreatment		10
711	Pesticide	Broadcast ground		11
712	Pesticide	Broadcast ground hood		12
713	Pesticide	Broadcast ground foliar		13
721	Pesticide	Broadcast ground inc		21
722	Pesticide	Broadcast ground hood inc		22
731	Pesticide	Broadcast aerial		31
732	Pesticide	Broadcast aerial foliar		32
771	Pesticide	Band/sidedress		71
772	Pesticide	Band/sidedres hood		72
773	Pesticide	Band/sidedress foliar		73
776	Pesticide	Band/sidedress injected		76
791	Pesticide	Spot treatment		91
792	Pesticide	Spot treatment hood		92
793	Pesticide	Spot treatment foliar		93

Table 4-3. List of other operations defined for CEAP APEX simulations.

Code ID	APEX Name	Additional Explanation
117	No-till Planter In-Row Sub-Soiler	Combined Notill planter and in-row subsoiler
401	Kill	
402	Combine - potato harvester	
410	hrv asparagus	
411	hrv veget greens	
412	hrv turnip root	
413	hrv sod turf	
414	hrv brus sprouts	
415	hrv onions or garlic	
416	Tying Machine	
417	Topper	
418	hrv green bean or pea	
419	hrv tomato	
420	hrv sweet corn	
421	hrv pumpkin or squash	
422	hrv sweet potatoes	
423	hrv cabbage or lettuce	
424	hrv melons	
425	hrv chilli peppers	
426	hrv cucumbers	
427	hrv eggplant or bell pepper	
428	hrv celery	
429	hrv strawberries	
430	hrv cauliflower or broccoli	
431	hrv graze crop THEN KILL	
432	Combine hrv before Straw hrv	Combine to use if straw harvested
433	Baler Med Residue	Baler to follow combine, no mower
434	Baler High Residue	Baler to flollow combine if mowed/raked
435	Transplanter, Carousel	
436	CRP_clip	
437	ClearCut	
438	HolePunchTreePlant	
449	Baler Low Residue	For Peanut and Soybean residue harvest
450	Idle Fallow Placeholder	
466	Mow Chop Kill noharv	terminate cover crops
467	hrv graze crop no kill	graze where grain harvested later
468	StartGraze	
469	StopGraze 0.35	Stops grazing when 35% of HU reached.
470	StopGraze 0.95	Stops grazing when 95% of HU reached.
471	StopGrazeDay	Stops grazing on specified date

Table 5-1. Rules for Fertilizer Application Programming for 2003 Samples.

Application Time Code	Name	Rule
1	Fall	Last day of FertMonth except 7 days before planting for WinterWheat
2	Pre-Plant	7 days before planting
3	At Plant	Day of plantig
4	After Plant	21 days after planting, unless Winter Wheat or perennial, in which case on 15th of month

Table 5-2. APEX operation coefficients for application of fertilizer by method.

APEX Name	Mixing Effic.	Surface Random Roughness	Tillage Depth	Ridge Height	Ridge Interval	Method Description
ANHYTRAC	0.3	13	150	25	0.3	Anhydrous Applicator, tractor implement
FertBsur	0	0	0	0	0	Surface Broadcast no incorporation
FertBinc	0.3	20	75	50	0	Surface Broadcast incorpation
FertSeed	0	0	50	0	0	In furrow or with seed or band
FertIrri	0	0	87	0	0	With irrigation water
FertInjK	0.3	13	150	25	0	Knifed or injected
FertBand	0	0	0	0	0	Banded or side dressed on or above row
FertFoli	0	0	0	0	0	Foliar or directed spray

*APEX includes other coefficients, however, their values are zero or null for these operations.

All values in millimeters.

Table 5-3. Nitrogen fertilizer adjustment in the UMRB.

Crop	Total cases in UMRB sample	Cases adjusted		Pounds per acre of nitrogen added by percentile					
		Number	Percent of All Cases	Mean Adjust.	10th	25th	50th	75th	90th
Corn grain	3,272	1,980	60	41	5	13	30	59	95
Corn silage	131	46	35	42	6	14	36	66	80
Winter wheat	197	61	31	27	4	13	26	39	49
Oats	139	99	71	36	7	17	35	49	67
Other wheat	55	21	38	34	3	10	31	48	66
Sorghum grain	32	18	56	22	2	4	18	34	68
All non-legume	4,030	2,157	54	40	5	13	29	57	92

Table 5-4. Phosphorus fertilizer adjustment in the UMRB.

		Average P rate by source (lbs/acre/year)				
Acres 1000	**Percent of Acres**	**Reported Fertilizer**	**Reported Manure**	**Reported ALL**	**Added**	**Adjusted Total**
Non-adjusted						
3,820	6.6	21.5	30.7	52.2	0.0	52.2
27,172	46.7	29.7	0.0	29.7	0.0	29.7
1,782	3.1	0.0	47.8	47.8	0.0	47.8
6	0.0	0.0	0.0	0.0	0.0	0.0
Adjusted						
7,264	12.5	0.0	0.0	0.0	36.7	36.7
2,151	3.7	0.0	10.3	10.3	25.9	36.2
14,379	24.7	17.4	0.0	17.4	6.3	23.7
1,628	2.8	14.4	17.8	32.2	6.3	38.5
Total						
58,202	100.0					

Table 6-1. Manure composition coefficients.

ID	live_type	On Farm Storage	ID	Mangement	C: N	lbsNton	lbsPton	orgPfrac	orgNfrac	lbsCton
1	Beef	Solids	1	Stacking Slab 50% TS	19	19	7	0.4	0.6	361
2	Beef	Solids	2	Covered slab 55% TS	19	21	7	0.4	0.6	399
3	Beef	Solids	3	Manure pack 59 - 67% TS	19	25	9	0.4	0.8	475
4	Beef	Solids	4	Barn, shed, or house 30% TS	19	11	5	0.4	0.6	209
5	Beef	Solids	5	Other 45% TS	19	17	6	0.4	0.6	323
6	Beef	Slurry	7	Concrete or steel tank, basin, or pit	17	9	2	0.4	0.5	153
7	Beef	Slurry	8	Earthen storage facility	17	9	2	0.4	0.5	153
8	Beef	Slurry	9	Other	17	9	2	0.4	0.5	153
9	Beef	Liquid	10	Single stage lagoon or holding pond	3	0.8	0.55	0.4	0.5	2.4
10	Beef	Liquid	11	Two stage lagoon system with second stage either lagoon or holding pond	3	0.8	0.55	0.4	0.5	2.4
11	Beef	Liquid		Runoff storage pond used only for collection of open lot runoff	3	1	0.5	0.4	0.5	3
12	Beef	Liquid	12	Other	3	0.8	0.55	0.4	0.5	2.4
13	Beef	no storage	6	No storage	17	10	4	0.4	0.5	170
14	Beef	information about		no information (default)	19	17	7	0.4	0.6	323
15	Dairy	Solids	1	Stacking Slab 35%TS	15	13	7	0.25	0.6	190
16	Dairy	Solids	2	Covered slab 30% TS	18	12	6	0.25	0.6	210
17	Dairy	Solids	3	Manure pack 67% TS	18	14	10	0.25	0.6	250
18	Dairy	Solids	4	Barn, shed, or house 18% - 25% TS	10	10	3	0.25	0.6	100
19	Dairy	Solids	5	Other 45% TS	14	12	8	0.25	0.6	168
20	Dairy	Slurry	7	Concrete or steel tank, basin, or pit	16	5.5	2	0.25	0.6	88
21	Dairy	Slurry	8	Earthen storage facility	16	5.5	2	0.25	0.6	88
22	Dairy	Slurry	9	Other	16	5.5	2	0.25	0.6	88
23	Dairy	Liquid	10	Single stage lagoon or holding pond	3	1.2	0.3	0.25	0.8	3.6
24	Dairy	Liquid	11	Two stage lagoon system with second stage either lagoon or holding pond	3	1.2	0.3	0.25	0.8	3.6
25	Dairy	Liquid		Runoff storage pond used only for collection of open lot runoff	3	1.2	0.5	0.25	0.8	3.6
26	Dairy	Liquid	12	Other	3	1.2	0.3	0.3	0.8	3.6
27	Dairy	no storage	6	No storage	16	9	2.5	0.25	0.6	144
28	Dairy	information about		no information (default)	10	12	8	0.25	0.6	120
29	swine	solids		all	6	13	4.2	0.35	0.5	78
30	swine	slurry		all	13	8.3	3.1	0.35	0.4	107.9
31	swine	liquid		all	2	1.1	0.3	0.35	0.2	2.2
32	swine	solids		no storage	6	12	4	0.35	0.5	72
33	sheep	solids		manure pack	7	14	6	0.4	0.8	100
34	sheep	solids		barn, shed, or house	10	14	7	0.4	0.8	140
35	poultry	solids		stockplied litter (#1, 2, or 3 solid storage types)	14	36	34	0.4	0.85	504
36	poultry	solids		liter in house (# 4, 5, or 6 solid storage types, and default)	14	67	20	0.4	0.9	938
37	poultry	slurry		all (applicable for some layer operations)	5	17	5.8	0.4	0.3	85
38	poultry	liquid		all (applicable for some layer operations)	2	2	0.4	0.4	0.15	4
39	equine	solids		any storage	25	14	5	0.4	0.9	350
40	equine	solids		no storage	25	14	5	0.4	0.9	350
41	biosolids	solid		all	13	6	4	0.4	0.7	78
42	biosolids	slurry		all	10	2	1	0.4	0.7	20
43	biosolids	liquid		all	6	1	1	0.4	0.7	6

NHx_shareAll	minNprop	minPprop	orgNprop	orgPprop	NHx_share_minN	orgCprop	minNvsN	orgNvsN	minPvsP	orgPvsP
0.28	0.0038	0.0021	0.0057	0.0014	0.7	0.153425	0.4	0.6	0.6	0.4
0.28	0.0042	0.0021	0.0063	0.0014	0.7	0.169575	0.4	0.6	0.6	0.4
0.14	0.0025	0.0027	0.01	0.0018	0.7	0.201875	0.2	0.8	0.6	0.4
0.28	0.0022	0.0015	0.0033	0.001	0.7	0.088825	0.4	0.6	0.6	0.4
0.28	0.0034	0.0018	0.0051	0.0012	0.7	0.137275	0.4	0.6	0.6	0.4
0.495	0.00225	0.0006	0.00225	0.0004	0.99	0.065025	0.5	0.5	0.6	0.4
0.495	0.00225	0.0006	0.00225	0.0004	0.99	0.065025	0.5	0.5	0.6	0.4
0.495	0.00225	0.0006	0.00225	0.0004	0.99	0.065025	0.5	0.5	0.6	0.4
0.495	0.0002	0.000165	0.0002	0.00011	0.99	0.00102	0.5	0.5	0.6	0.4
0.495	0.0002	0.000165	0.0002	0.00011	0.99	0.00102	0.5	0.5	0.6	0.4
0.495	0.00025	0.00015	0.00025	0.0001	0.99	0.001275	0.5	0.5	0.6	0.4
0.495	0.0002	0.000165	0.0002	0.00011	0.99	0.00102	0.5	0.5	0.6	0.4
0.3	0.0025	0.0012	0.0025	0.0008	0.6	0.07225	0.5	0.5	0.6	0.4
0.28	0.0034	0.0021	0.0051	0.0014	0.7	0.137275	0.4	0.6	0.6	0.4
0.2	0.0026	0.002625	0.0039	0.000875	0.5	0.08075	0.4	0.6	0.75	0.25
0.2	0.0024	0.00225	0.0036	0.00075	0.5	0.08925	0.4	0.6	0.75	0.25
0.2	0.0028	0.00375	0.0042	0.00125	0.5	0.10625	0.4	0.6	0.75	0.25
0.2	0.002	0.001125	0.003	0.000375	0.5	0.0425	0.4	0.6	0.75	0.25
0.2	0.0024	0.003	0.0036	0.001	0.5	0.0714	0.4	0.6	0.75	0.25
0.396	0.0011	0.00075	0.00165	0.00025	0.99	0.0374	0.4	0.6	0.75	0.25
0.396	0.0011	0.00075	0.00165	0.00025	0.99	0.0374	0.4	0.6	0.75	0.25
0.396	0.0011	0.00075	0.00165	0.00025	0.99	0.0374	0.4	0.6	0.75	0.25
0.198	0.00012	0.0001125	0.00048	0.0000375	0.99	0.00153	0.2	0.8	0.75	0.25
0.198	0.00012	0.0001125	0.00048	0.0000375	0.99	0.00153	0.2	0.8	0.75	0.25
0.198	0.00012	0.0001875	0.00048	0.0000625	0.99	0.00153	0.2	0.8	0.75	0.25
0.198	0.00012	0.000105	0.00048	0.000045	0.99	0.00153	0.2	0.8	0.7	0.3
0.396	0.0018	0.0009375	0.0027	0.0003125	0.99	0.0612	0.4	0.6	0.75	0.25
0.2	0.0024	0.003	0.0036	0.001	0.5	0.051	0.4	0.6	0.75	0.25
0.495	0.00325	0.001365	0.00325	0.000735	0.99	0.03315	0.5	0.5	0.65	0.35
0.57	0.00249	0.0010075	0.00166	0.0005425	0.95	0.0458575	0.6	0.4	0.65	0.35
0.792	0.00044	0.0000975	0.00011	0.0000525	0.99	0.000935	0.8	0.2	0.65	0.35
0.495	0.003	0.0013	0.003	0.0007	0.99	0.0306	0.5	0.5	0.65	0.35
0.12	0.0014	0.0018	0.0056	0.0012	0.6	0.0425	0.2	0.8	0.6	0.4
0.12	0.0014	0.0021	0.0056	0.0014	0.6	0.0595	0.2	0.8	0.6	0.4
0.147	0.0027	0.0102	0.0153	0.0068	0.98	0.2142	0.15	0.85	0.6	0.4
0.098	0.00335	0.006	0.03015	0.004	0.98	0.39865	0.1	0.9	0.6	0.4
0.693	0.00595	0.00174	0.00255	0.00116	0.99	0.036125	0.7	0.3	0.6	0.4
0.8415	0.00085	0.00012	0.00015	0.00008	0.99	0.0017	0.85	0.15	0.6	0.4
0.06	0.0007	0.0015	0.0063	0.001	0.6	0.14875	0.1	0.9	0.6	0.4
0.06	0.0007	0.0015	0.0063	0.001	0.6	0.14875	0.1	0.9	0.6	0.4
0.18	0.0009	0.0012	0.0021	0.0008	0.6	0.03315	0.3	0.7	0.6	0.4
0.18	0.0003	0.0003	0.0007	0.0002	0.6	0.0085	0.3	0.7	0.6	0.4
0.18	0.00015	0.0003	0.00035	0.0002	0.6	0.00255	0.3	0.7	0.6	0.4

Table 6-2. Application losses of nitrogen with various application strategies.

Application Method	% N
Dry broadcast without incorporation-poultry litter	50
Dry broadcast without incorporation – other manure	35
Dry broadcast with incorporation	20
Liquid broadcast without incorporation	30
Liquid broadcast with incorporation	15
Chiseled, injected or knifed in	5
Furrow or basin irrigated	25
Sprinkler irrigated	35

Table 6-3. N and P values for manure from the basic CEAP systems.

	Nutrient Content (%)	
	N	**P**
Beef		
Solids		
Stacking Slab 50% TS	19	7
Covered slab 55% TS	21	10
Manure pack 59 - 67% TS	25	9
Barn, shed, or house 30% TS	11	5
Other 45% TS	17	7
Slurry		
Concrete or steel tank, basin, or pit	9	2
Earthen storage facility	9	2
Other	9	2
Liquid		
Single stage lagoon or holding pond	0.8	0.55
Two stage lagoon system with second stage either lagoon or holding pond	0.8	0.55
Runoff storage pond used only for collection of open lot runoff	1	0.5
Other	0.8	0.55
No storage	10	4
Dairy		
Solids		
Stacking Slab 35%TS	13	7
Covered slab 30% TS	12	6
Manure pack 67% TS	14	10
Barn, shed, or house 18% - 25% TS	10	3
Other 45% TS	12	8
Slurry		
Concrete or steel tank, basin, or pit	5.5	2
Earthen storage facility	5.5	2
Other	5.5	2
Liquid		
Single stage lagoon or holding pond	1.2	0.3
Two stage lagoon system with second stage either lagoon or holding pond	1.2	0.3
Runoff storage pond used only for collection of open lot runoff	1	0.5
Other	1.2	0.3
No storage	9	2.5

Table 6-3. N and P values for manure from the basic CEAP systems.

6-3. continued.

Hogs		
Solids		
Stacking Slab 20% TS	13	4.6
Covered slab 20% TS	13	4.6
Manure pack	NA	NA
Barn, shed, or house	NA	NA
Other	NA	NA
Slurry		
Concrete or steel tank, basin, or pit	8.3	3.1
Earthen storage facility	8.3	3.1
Other	8.3	3.1
Liquid		
Single stage lagoon or holding pond	1.1	0.3
Two stage lagoon system with second stage either lagoon or holding pond	1.1	0.3
Runoff storage pond used only for collection of open lot runoff	NA	NA
Other	1.1	0.3
No storage	12	4
Sheep		
Solids		
Stacking Slab	NA	NA
Covered slab	NA	NA
Manure pack	14	6
Barn, shed, or house	14	7
Other	NA	NA
Slurry		
Concrete or steel tank, basin, or pit	NA	NA
Earthen storage facility	NA	NA
Other	NA	NA
Liquid		
Single stage lagoon or holding pond	NA	NA
Two stage lagoon system with second stage either lagoon or holding pond	NA	NA
Runoff storage pond used only for collection of open lot runoff	NA	NA
Other	NA	NA
No storage	NA	NA

Table 6-3. N and P values for manure from the basic CEAP systems.

6-3 continued.

Poultry		
Solids		
Stacking Slab	NA	NA
Covered slab	36	34
Manure pack	NA	NA
Barn, shed, or house - Pit	38	25
Other (Litter)	67	20
Slurry		
Concrete or steel tank, basin, or pit	17	5.8
Earthen storage facility		
Other		
Liquid		
Single stage lagoon or holding pond	2	0.4
Two stage lagoon system with second stage either lagoon or holding pond		
Runoff storage pond used only for collection of open lot runoff	NA	NA
Other		
No storage	NA	NA
Equine		
Solids		
Stacking Slab	14	5
Covered slab	14	5
Manure pack	14	5
Barn, shed, or house - Pit	14	5
Other	14	5
Slurry		
Concrete or steel tank, basin, or pit	NA	NA
Earthen storage facility	NA	NA
Other	na	na
Liquid		
Single stage lagoon or holding pond	NA	NA
Two stage lagoon system with second stage either lagoon or holding pond	NA	NA
Runoff storage pond used only for collection of open lot runoff	NA	NA
Other	NA	NA
No storage	14	5

Table 6-3. N and P values for manure from the basic CEAP systems.

6-3 continued.

Biosolids		
Solids		
Stacking Slab	6	4
Covered slab	6	4
Manure pack	NA	NA
Barn, shed, or house - Pit	NA	NA
Other	6	4
Slurry		
Concrete or steel tank, basin, or pit	2	1
Earthen storage facility	2	1
Other	2	1
Liquid		
Single stage lagoon or holding pond	NA	NA
Two stage lagoon system with second stage either lagoon or holding pond	NA	NA
Runoff storage pond used only for collection of open lot runoff	NA	NA
Other	NA	NA
No storage	2	1
OTHER Livestock	15	7
DON'T KNOW Livestock Source	15	7
COMPOST		
Stacking Slab 50% TS	14	9
Covered slab 55% TS	14	9
Manure pack 59 - 67% TS	NA	NA
Barn, shed, or house 30% TS	14	9
Other 45% TS	14	9
No storage	14	9

Table 6-4. Intermediate step to prepare Table 6-1. Manure Composition Coefficients

onfarm_stor	onfarm_stor_id	manage	lbsNton	lbsPton	orgPfrac	orgNfrac	OrgN frac NC State	OrgN frac Other	lbsCton	C:N Ratios
Solids	1	Stacking Slab 50% TS	19	7	0.4	0.6	0.6		361	19
Solids	2	Covered slab 55% TS	21	7	0.4	0.6	0.6		399	19
Solids	3	Manure pack 59 - 67% TS	25	9	0.4	0.8	0.8	0.85	475	19
Solids	4	Barn, shed, or house 30% TS	11	5	0.4	0.6	0.6		209	19
Solids	5	Other 45% TS	17	6	0.4	0.6	0.6		323	19
Slurry	7	Concrete or steel tank, basin, or pit	9	2	0.4	0.5	0.5		153	17
Slurry	8	Earthen storage facility	9	2	0.4	0.5	0.5		153	17
Slurry	9	Other	9	2	0.4	0.5	0.5		153	17
Liquid	10	Single stage lagoon or holding pond	0.8	0.55	0.4	0.5	0.5		2.4	3
Liquid	11	Two stage lagoon system with second stage either lagoon or holding pond	0.8	0.55	0.4	0.5	0.5		2.4	3
Liquid		Runoff storage pond used only for collection of open lot runoff	1	0.5	0.4	0.5	0.5		3	3
Liquid	12	Other	0.8	0.55	0.4	0.5	0.5		2.4	3
no storage	6	No storage	10	4	0.4	0.5	0.5		170	17
off-farm or no information about storage		no information (default)	17	7	0.4	0.6	0.6		323	19
Solids	1	Stacking Slab 35%TS	13	7	0.25	0.6	0.6		190	14.6
Solids	2	Covered slab 30% TS	12	6	0.25	0.6	0.6		210	17.5
Solids	3	Manure pack 67% TS	14	10	0.25	0.6	0.6		250	17.9
Solids	4	Barn, shed, or house 18% - 25% TS	10	3	0.25	0.6	0.6		100	10
Solids	5	Other 45% TS	12	8	0.25	0.6	0.6		168	14
Slurry	7	Concrete or steel tank, basin, or pit	5.5	2	0.25	0.6	0.6	0.5	88	16
Slurry	8	Earthen storage facility	5.5	2	0.25	0.6	0.6	0.5	88	16
Slurry	9	Other	5.5	2	0.25	0.6	0.6	0.5	88	16
Liquid	10	Single stage lagoon or holding pond	1.2	0.3	0.25	0.8	0.8	0.4	3.6	3
Liquid	11	Two stage lagoon system with second stage either lagoon or holding pond	1.2	0.3	0.25	0.8	0.8	0.4	3.6	3
Liquid		Runoff storage pond used only for collection of open lot runoff	1.2	0.5	0.25	0.8	0.8	0.4	3.6	3
Liquid	12	Other	1.2	0.3	0.3	0.8	0.8	0.4	3.6	3

no storage	**6**	No storage	**9**	**2.5**	0.25	0.6	0.6		144	16
off-farm or no information about storage		no information (default)	**12**	**8**	0.25	0.6	0.6		120	10
solids		all	**13**	**4.2**	0.35	0.5	0.5		78	6
slurry		all	**8.3**	**3.1**	0.35	0.4	0.4	0.3	108	13
liquid		all	**1.1**	**0.3**	0.35	0.2	0.2	0.3	2.2	2
solids		no storage	**12**	**4**	0.35	0.5	0.5		72	6
solids		manure pack	**14**	**6**	0.4	0.8	0.8		100	7.14
solids		barn, shed, or house	**14**	**7**	0.4	0.8	0.8		140	10
solids		stockplied litter (#1, 2, or 3 solid storage types)	**36**	**34**	0.4	0.85	0.85	0.8	504	14
solids		liter in house (# 4, 5, or 6 solid storage types, and default)	**67**	**20**	0.4	0.9	0.9	0.8	938	14
slurry		all (applicable for some layer operations)	**17**	**5.8**	0.4	0.3	0.3		85	5
liquid		all (applicable for some layer operations)	**2**	**0.4**	0.4	0.15	0.15	0.25	4	2
solids		any storage	**14**	**5**	0.4	0.9	0.9	0.25	350	25
solids		no storage	**14**	**5**	0.4	0.9	0.9		350	25
solid		all	**6**	**4**	0	0.7	0.7	0.7	78	13
slurry		all	**2**	**1**	0	0.7	0.7	0.7	20	10
liquid		all	**1**	**1**	0	0.7	0.7	0.7	6	6

NI - No Information

C:N Ratios from NRCS	C:N Ratios from other sources	C:N On-Farm Composting Handbook	NHx_shareAll	minNprop	minPprop	orgNprop	orgPprop	NHx_share_minN	orgCprop
	19	19	0.06	0.00095	0.0021	0.008549999	0.0014	0.6	0.1235
	19	19	0.06	0.00105	0.0021	0.00945	0.0014	0.6	0.1365
13	19	19	0.06	0.00125	0.0024	0.01125	0.0016	0.6	0.15
	19	19	0.06	0.00055	0.0015	0.00495	0.001	0.6	0.0715
	19	19	0.06	0.00085	0.0018	0.00765	0.0012	0.6	0.102
			0.594	0.0027	0.0009	0.0018	0.0006	0.99	0.18
			0.594	0.0027	0.0009	0.0018	0.0006	0.99	0.18
			0.594	0.0027	0.0009	0.0018	0.0006	0.99	0.18
			0.6435	0.00026	0.00009	0.00014	0.00006	0.99	0.006
			0.6435	0.00026	0.00009	0.00014	0.00006	0.99	0.006
			0.6435	0.000325	0.00015	0.000175	0.0001	0.99	0.006
			0	0	0	0	0	0	0.006
			0.06	0.0005	0.0009	0.0045	0.0006	0.6	0.065
			0.06	0.00085	0.0018	0.00765	0.0012	0.6	0.1105
	18		0.05	0.00095	0.002625	0.008549999	0.000875	0.5	0.095
	18		0.05	0.00105	0.00225	0.00945	0.00075	0.5	0.105
	18		0.05	0.00125	0.00375	0.01125	0.00125	0.5	0.125
	18		0.05	0.0005	0.0015	0.0045	0.0005	0.5	0.05
	18		0.05	0.0006	0.003	0.0054	0.001	0.5	0.084
	16		0.594	0.00165	0.00075	0.0011	0.00025	0.99	0.11
	16		0.594	0.00165	0.00075	0.0011	0.00025	0.99	0.11
	16		0.594	0.00165	0.00075	0.0011	0.00025	0.99	0.11
3			0.6435	0.000455	0.000113	0.000245	0.0000375	0.99	0.0085
3			0.6435	0.000455	0.000113	0.000245	0.0000375	0.99	0.0085
			0.6435	0.000325	0.000188	0.000175	0.0000625	0.99	0.006
			0	0	0	0	0	0	0.006

			0.3465	0.001575	0.000938	0.002925	0.0003125	0.99	0.045
			0.05	0.0006	0.003	0.0054	0.001	0.5	0.06
			0.48	0.0039	0.001788	0.0026	0.0009625	0.8	0.039
5	20	14	0.6435	0.0026	0.001073	0.0014	0.0005775	0.99	0.128
2			0.792	0.00048	9.75E-05	0.00012	0.0000525	0.99	0.01
			0.48	0.0036	0.0013	0.0024	0.0007	0.8	0.036
10		16	0.15	0.00125	0.0018	0.00375	0.0012	0.6	0.05
	16	16	0.15	0.00175	0.0021	0.00525	0.0014	0.6	0.07
	15	14	0.441	0.0081	0.0042	0.0099	0.0028	0.98	0.162
9	15	14	0.441	0.015075	0.006	0.018425	0.004	0.98	0.304
		6	0.099	0.00075	0.00195	0.00675	0.0013	0.99	0.21
2			0.099	0.0001	0.00012	0.0009	8E-05	0.99	0.008
19		30	0.15	0.00175	0.0015	0.00525	0.001	0.6	0.133
19		30	0.15	0.00175	0.0015	0.00525	0.001	0.6	0.133
			0	0.03	0.0185	0	0	0	0.3
	10	10	0	0.01	0.004	0	0	0	0.4
			0	0.0025	0.004	0	0	0	0.03

Table 6-5. Nitrogen and Phosphorus from Grazed Animals

Grazing	Region	Manure Tons/day.anima	lbsNton	lbsPton	orgPfrac	orgNfrac	lbsCton	NHx_shareAll	minNprop	minPprop
Dairy		0.051	12	2.5	0.3	0.8	95	0.2	0.0012	0.00088
Beef		0.027	12	5	0.4	0.5	140	0.33	0.003	0.0015
Cattle	appalachia	0.028	12.0	4.884	0.395	0.514	137.907	0.324	0.003	0.001
	cornbelt	0.029	12.000	4.760	0.390	0.529	135.673	0.318	0.003	0.001
	deltastate	0.028	12.000	4.943	0.398	0.507	138.977	0.327	0.003	0.001
	lakestate	0.035	12.000	4.194	0.368	0.597	125.484	0.288	0.002	0.001
	mountain	0.029	12.000	4.836	0.393	0.520	137.039	0.321	0.003	0.001
	northeast	0.036	12.000	4.107	0.364	0.607	123.929	0.284	0.002	0.001
	northplain	0.028	12.000	4.919	0.397	0.510	138.548	0.326	0.003	0.001
	pacific	0.030	12.000	4.716	0.389	0.534	134.886	0.315	0.003	0.001
	southeast	0.028	12.000	4.931	0.397	0.508	138.757	0.326	0.003	0.001
	southplain	0.027	12.000	4.954	0.398	0.505	139.180	0.328	0.003	0.001
Swine		0.005	13.5	4	0.4	0.38	91	0.62	0.00419	0.0012
Sheep		0.0028	22	3.8	0.4	0.7	85	0.28	0.0033	0.00114
Horse		0.0275	12	2.7	0.3	0.9	360	0.1	0.0006	0.00041

orgNprop	orgPprop	NHx_share_minN	orgCprop	Ave Weight Pounds
0.0048	0.0004	1	0.0404	1200
0.003	0.001	0.67	0.0595	825
0.003	0.001	0.685	0.0563	890
0.003	0.001	0.702	0.0566	905
0.003	0.001	0.678	0.0562	880
0.004	0.001	0.776	0.0577	950
0.003	0.001	0.692	0.0564	895
0.004	0.001	0.788	0.0579	960
0.003	0.001	0.681	0.0563	885
0.003	0.001	0.708	0.0567	905
0.003	0.001	0.679	0.0562	895
0.003	0.001	0.676	0.0562	880
0.0026	0.0008	1	0.0387	150
0.0077	0.0008	1	0.0361	130
0.0054	0.0009	1	0.153	1100

Table 6-6. Textbook type data for Nitrogen and Phosphorus Content of Grazed Livestock Manure.

vestock Typ	Source	Typical Weight - lbs	As Excreted Manure - Tons per day per animal	As Excreted N - Pounds per Ton	As Excreted P - Pounds per Ton	Percent Urine	Ammonia as percent TKN	C:N Ratio	TOC as pounds per ton[1]
DAIRY		1200							
	NC State		0.052	10	2.2	32	19		62
	NRCS		0.049	10	1.7			12	
	ASABE		0.052	16	3.7				
	USED		0.051	12	2.5				
BEEF		825							
	NC State		0.03	12	5.2	30	33		120
	NRCS		0.023	13	4.8			11	
	USED		0.027	12	5				
SWINE		150							
	NC State		0.006	12	4	50	62		77
	NRCS		0.004	13.3	5.1			7	
	ASABE		0.005	16.6	2.8				
	USED		0.005	13.5	4				
SHEEP		130							
	NC State		0.003	21	4.1	37	28		71
	NRCS		0.0026	22.5	3.5			10	
	USED		0.0028	22	3.8				
HORSE									
	NC State	1100	0.0275	12	2.7	20	10	30	

[1] NC State reference shows total carbon for fresh swine manure at 89 pounds per ton

Nitrate lbs/ton	TKN lbs/ton
0.025	
	12
1.4	
	10.6
0.057	
	13.5
0	
	22

Table 6-7. Regional weighting of the category Cattle.

asm10r	st_txt	state	No of dairy	No of Beef	Wt Beef	Ave Dairy
appalachia	21	KY	2.9	44.6	15.4	1.5
appalachia	37	NC	1.2	22.5	18.8	
appalachia	47	TN	1.4	49.1	35.1	
appalachia	51	VA	1.6	26.1	16.3	
appalachia	54	WV	0.5	13.3	26.6	
cornbelt	17	IL	1.6	18.3	11.4	3.2
cornbelt	18	IN	2.8	19.9	7.1	
cornbelt	19	IA	3	29.3	9.8	
cornbelt	29	MO	4	60.9	15.2	
cornbelt	39	OH	4.8	23.9	5.0	
deltastate	05	AR	0.5	29.4	58.8	0.5
deltastate	22	LA	0.4	14.6	36.5	
deltastate	28	MS	0.6	20.5	34.2	
lakestate	26	MI	3	11.5	3.8	8.8
lakestate	27	MN	6.5	21.5	3.3	
lakestate	55	WI	16.9	21.2	1.3	
mountain	04	AZ	0.3	2.5	8.3	0.5
mountain	08	CO	0.6	12.7	21.2	
mountain	16	ID	1	9.9	9.9	
mountain	30	MT	0.6	12.4	20.7	
mountain	32	NV	0.1	1.4	14.0	
mountain	35	NM	0.4	7	17.5	
mountain	49	UT	0.7	6	8.6	
mountain	56	WY	0.3	5	16.7	
northeast	09	CT	0.3	1	3.3	1.9
northeast	10	DE	0.1	0.3	3.0	
northeast	23	ME	0.6	1	1.7	
northeast	24	MD	0.8	3	3.8	
northeast	25	MA	0.4	1	2.5	
northeast	33	NH	0.3	0.6	2.0	
northeast	34	NJ	0.1	1.4	14.0	
northeast	36	NY	7.4	9	1.2	
northeast	42	PA	9.6	19	2.0	
northeast	44	RI	0.05	0.15	3.0	
northeast	50	VT	1.6	1	0.6	
northplain	20	KS	1	31	31.0	0.7
northplain	31	NE	0.1	25	250.0	
northplain	38	ND	0.6	11	18.3	
northplain	46	SD	1.1	17	15.5	
pacific	06	CA	2.8	14	5.0	1.7
pacific	41	OR	1.1	15	13.6	
pacific	53	WA	1.2	11	9.2	
southeast	01	AL	0.2	26.8	134.0	0.6
southeast	12	FL	0.9	18	20.0	
southeast	13	GA	0.8	23	28.8	
southeast	45	SC	0.3	9.7	32.3	
southplain	40	OK	1.8	57	31.7	1.9

southplain	48	TX	2	148	74.0

Ave Beef	Beef by Region		Manure Tons/day.animal	lbsNton	lbsPton	orgPfrac	orgNfrac	lbsCton	NHx_shareAll
31.1	20.5	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.028	12.000	4.884	0.395	0.514	137.907	0.324
30.5	9.4	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.029	12.000	4.760	0.390	0.529	135.673	0.318
21.5	43.0	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.028	12.000	4.943	0.398	0.507	138.977	0.327
18.1	2.1	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.035	12.000	4.194	0.368	0.597	125.484	0.288
7.1	14.2	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.029	12.000	4.836	0.393	0.520	137.039	0.321
3.4	1.8	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.036	12.000	4.107	0.364	0.607	123.929	0.284
21.0	30.0	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.028	12.000	4.919	0.397	0.510	138.548	0.326
13.3	7.8	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.030	12.000	4.716	0.389	0.534	134.886	0.315
19.4	35.2	Dairy	0.051	12	2.5	0.3	0.8	95	0.2
		Beef	0.027	12	5	0.4	0.5	140	0.33
		Weighted	0.028	12.000	4.931	0.397	0.508	138.757	0.326
102.5	53.9	Dairy	0.051	12	2.5	0.3	0.8	95	0.2

Beef	0.027	12	5	0.4	0.5	140	0.33
Weighted	0.027	12.000	4.954	0.398	0.505	139.180	0.328

minNprop	minPprop	orgNprop	orgPprop	NHx_share_minN	orgCprop
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.685	0.056
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.702	0.057
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.678	0.056
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.002	0.001	0.004	0.001	0.776	0.058
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.692	0.056
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.002	0.001	0.004	0.001	0.788	0.058
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.681	0.056
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.708	0.057
0.0012	0.000875	0.0048	0.000375	1	0.0612
0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.679	0.056
0.0012	0.000875	0.0048	0.000375	1	0.0612

0.003	0.0015	0.003	0.001	0.67	0.0561
0.003	0.001	0.003	0.001	0.676	0.056

Table 6-8. Data variables collected for each manure application event.	
FIPS and PSU_ID	
Crop Year	
Primary crop for which nutrients were intended	
Crop Code	
Where was the manure produced	1. On this operation 2. Purchased 3. Obtained at no cost off this operation 4. Obtained with compensation
How was the manure handled? [Only if 1 in previous column]	1. Solid 2. Liquid 3. Slurry
Materials Used – Nitrogen as N	Enter percentage analysis or actual pounds of plant nutrients applied per acre.
Materials Used – Phosphorus as P_2O_5	Enter percentage analysis or actual pounds of plant nutrients applied per acre.
What quantity of manure was applied per acre?	
Unit Code	1 pounds 12 gallons 15 tons 19 pounds of actual nutrients
Major source of manure	1 Beef cattle 2 Dairy cattle 3 Hogs 4 Sheep 5 Poultry 6 Equine 7 Biosolids 8 Other 9 Don't know
Was bedding material included in the manure?	1 Yes 2 Don't know 3 No
Was manure composted before application? (not in 2003 survey)	1 Yes 2 Don't know 3 No
When was this applied?	MMDDYY
How was this applied?	1 Dry broadcast, without incorporation 2 Dry broadcast, with incorporation 3 Liquid broadcast, without incorporation 4 Liquid broadcast, with incorporation 5 Chiseled, injected, or knifed in 6 Furrow or basin irrigated 7 Sprinkler irrigated
How many acres were treated in this application?	

Table 6-9. Additional manure management questions at field or farm level.	
How often do you plan to apply manure to this field in future years (2004 survey only)?	1 No plans to apply manure again 2 At least once per year 3 Once every 2 years 4 Once every 3 years 5 Once every 4 years 6 Once every 5 or more years
What type of manure storage system is used for the bulk of manure that is produced on this operation?	Solid 1 stacking slab (open concrete) 2 covered slab 3 manure pack 4 barn, shed, or house 5 other, specify: 6 none Slurry 7 concrete or steel tank, basin, or pit 8 earthen storage facility 9 other, specify Liquid 10 single stage lagoon or holding pond 11 two stage lagoon system with the second stage being either a lagoon or a holding pond 12 run off storage pond used only for collection of open-lot run off (2004 survey only) 13 other, specify
What was the frequency of manure applications by season?	For four seasons and for each of solid, slurry, and liquid: 1 daily 4 quarterly 2 weekly 5 semi-annual 3 monthly 6 annually
Was the use of commercial fertilizer reduced on this field in years when manure was applied?	Answer separately for N and P for 2004 survey
Were the manure application rates to this field influenced by State or local restrictions or by your conservation plan, nutrient management plan (NMP) or your comprehensive nutrient management plan (CNMP)?	What nutrient requirement basis was used to determine these manure applications (1 = Nitrogen, 2 = Phosphorus)? Were the manure application rates (1 = Increased, 2 = Decreased)?

Table 6-10. Data definition for table of standardized manure application events.

Sample ID	FIPS County ID (FIPS) and NRI Primary Sampling Unit and Point (PSU_ID)
Crop Year	
Crop ID	
Record Type	Indicates that nutrient calculations based on: 1) only animal type; 2) % analysis (e.g., 5-5-2 elemental content) or 3) actual lbs of N, P, and K
Application Year	(may be the year prior to the crop year)
Application Month	
Application Day (not in 2003 survey)	
Application Method	1 Dry broadcast, without incorporation 2 Dry broadcast, with incorporation 3 Liquid broadcast, without incorporation 4 Liquid broadcast, with incorporation 5 Chiseled, injected, or knifed in 6 Furrow or basin irrigated 7 Sprinkler irrigated
Manure Composite Material ID	
Assigned APEX Fertilizer ID	
Application Quantity	Total weight (as applied) of material applied
N applied	Calculated lbs per acre for the application event
P applied	Calculated lbs per acre for the application event
Unique NP indicator	If 1 then a unique composite fertilizer material will be defined for the event rather than assigning it to one of the standard materials

Table 6-11. Renaming of Manure Application Event Variables for Surveyed versus Calculated.

From Section 3 Table	"Manure Events" table
StorSys1_13	S_SolidStorID if value 1 - 6
StorSys1_13	S_SlurryStorID if value 7 - 9
StorSys1_13	S_LiquidStorID if value 10 - 13
NurtiReqNorP	S_requirement
Application Rate Tons/AC	C_tonrate
Record Type	C_record_type
Lbs N per ton Manure	C_lbsNton
Lbs P per ton Manure	C_lbsPton
Lbs N per acre	C_lbsNrate
Lbs N per acre	C_lbsPrate
Manure Consistency	C_consistency
Final Application Code	S_ManMeth
S_ManMeth	old_S_ManMeth
Percent of field treated	treatedProp
Crop Acres	S_acrescropped
NonCropAcres	S_acresidle (added to this variable)
IdleCropAcres	S_acresidle (added to this variable)
NonCultAcres	S_acresidle (added to this variable)
Field Acres	S_totalacresfield

Table 6-12. Settings for manure application in I_APEX Field Operations table.		
I_APEX Variable	**APEX Name**	**Instructions**
ID		set at [Control Record].ID determined for the sample
Subarea ID		will be 1 for this cropped portion of field
Year	IYEAR	Use [manYear] for 2003 and extract from "S_ManMnthDyYr" for 2004. The data are generally in terms of 2001, … , 2004. Convert to 1, 2, … and so on, consistent with rest of the sample
Month	MON	use [S_ManMonth] for 2003 and extract from "S_ManMnthDyYr" for 2004
Day	DAY	Extract from "S_ManMnthDyYr" for 2004. For 2003, if January – June, put on 1st day of month, if July – December, put on last day of month, unless operations in that month for the next crop year, in which case, put it 1 day after last operation of current cropyear and/or 1 day before 1st operation of next cropyear.
Type	COD	Use [S_ManMeth] as [Code] to link to [def Manure Application Methods] and write [CodeID] as the operation number
Crop ID	CRP	Read from [cropcode]
INT Variable	MAT or PTH or …	Write [FertManID] which tells APEX which row to use from fertilizer table
Parameter 1	OPV1	Multiply [C_tonrate] by 2241.7 to convert from tons/acre to kg/ha and then multiply by [NPKC fraction] from the fertilizer table to exclude the inert material (metric conversion based on 907.2 kg/ton and 2.471 acre/ha)
Parameter 2	OPV2	Set Depth as follows by [code] from ([S_ManMeth]: 1 0 2 100 mm 3 0 4 100 mm 5 100 mm 6 0 7 0
Parameter 3 … Parameter 7	OPV3 OPV7	na na

Table 7-1. CEAP Survey variables for grazing.

Variable	Settings	
Crop Purpose	1	Grazing
	2	Grain
	3	Dual use (grain/grazing)
	4	Cover crop
	5	Other
	6	Hay
	7	Human Consumption
	8	Silage/Haylage
	9	Seed Only
	10	Nurse Crop
Pre- or Post-harvest Grazing	1	Yes
	3	No
Field Acres		
Cropped Acres		
Type of Livestock	1	Cattle
	2	Sheep
	3	Goats
	4	Horses
	5	Other
Number of livestock for Pre-harvest grazing		
Number of days for Pre-harvest grazing		
Number of livestock for Post-harvest grazing		
Number of days for Post-harvest grazing		

Table 7-2. Month assignment for small grain grazing operations, by state and specie.

State	Id	Barley	Millet	Oats	Rye	Sorghum-sudan crosses	Triticale	Wheat durum	Wheat other spring	Wheat winter
CO	8		9				3			3
GA	13		7		3	plant + 4				
ID	16			6						
KS	20						3			3
MI	26				4					
MT	30	8		6			4		8	4
NE	31			5	4		4			4
NM	35						2			2
NC	37				3					
ND	38		9	6				8		
OK	40				2	plant + 4	2			2
PA	42			5						
SC	45		9		3					
SD	46		8						8	4
TX	48			Fall Plant = 3 Spring Plant = 5	2	plant + 4	2			2
VA	51				4					

Table 7-3. Grazing herd definition in APEX.

Variable	Definition
Herd Number	Will be set at 1 because only 1 herd per cropland subarea (if additional cropped subareas are replicated for representing practices, then the herd is also replicated with the livestock number adjusted proportionately if acreage is different).
Number of animals	Reported number divided by field acres, then multiplied by the 39.5 acres in standard sub-area. Initially set at the average of all grazing occurences for each sample, but will be reset with each grazing start operation.
Fraction of herd in feeding area	0.0 since not modeling an associated feed yard
Grazing rate	Daily biomass per head in kg (assumed to be 3% of live weight; see Table g2)
Daily Manure Dump	Kg/head
Manure ID	Fertilizer table ID number for each livestock manure type
Urine Volume	0 since not concerned with moisture build up in feedlot situation

Table 7-4. Animal size, feed consumption, and manure production assumptions.

Animal ID	Manure Fertilizer ID	Animal[a]	Region	Weight (lbs)	Feed (kg/day)	Manure (ton/day)	Manure (kg/day)
7	71	Dairy		1200	16.1	0.051	45.5
6	72	Beef		825	11	0.027	24.1
11	73	Cattle_AP	appalachia	890	11.9	0.028	25.1
12	74	Cattle_CB	cornbelt	905	12.1	0.029	26.2
13	75	Cattle_DLT	deltastate	880	11.8	0.028	24.6
14	76	Cattle_LKS	lakestate	950	12.7	0.035	31
15	77	Cattle_Mnt	mountain	895	12	0.029	25.5
16	78	Cattle_NE	northeast	960	12.9	0.036	31.8
17	79	Cattle_NP	northplain	885	11.9	0.028	24.8
18	80	Cattle_PAC	pacific	905	12.1	0.03	26.5
19	81	Cattle_SE	southeast	895	12	0.028	24.7
20	82	Cattle_SP	southplain	880	11.8	0.027	24.5
8	83	Swine		150	2	0.005	4.5
2	84	Sheep		130	1.7	0.003	2.5
4	85	Horse		1100	14.7	0.028	24.6
3	86	Goats		130	1.7	0.003	2.5

[a]The regional cattle coefficients represent weighted average of beef and dairy mixes for the region.

Table 7-5 . Specification of grazing manure in the APEX fertilizer table.

Animal	N (lbs/ ton)	P (lbs/ ton)	mineral N proportion	mineral P proportion	organic N proportion	organic P proportion	NHx share mineral N	organic C proportion
Dairy	12	2.5	0.0012	0.0009	0.0048	0.0004	1	0.0404
Beef	12	5	0.003	0.0015	0.003	0.001	0.67	0.0595
Cattle_AP	12	4.88	0.0029	0.0015	0.0031	0.001	0.6853	0.0563
Cattle_CB	12	4.76	0.0028	0.0014	0.0032	0.0009	0.7017	0.0566
Cattle_DL	12	4.94	0.003	0.0015	0.003	0.001	0.6775	0.0562
Cattle_LKS	12	4.19	0.0024	0.0013	0.0036	0.0008	0.7765	0.0577
Cattle_Mnt	12	4.84	0.0029	0.0015	0.0031	0.001	0.6917	0.0564
Cattle_NE	12	4.11	0.0024	0.0013	0.0036	0.0008	0.7879	0.0579
Cattle_NP	12	4.92	0.0029	0.0015	0.0031	0.001	0.6806	0.0563
Cattle_PA	12	4.72	0.0028	0.0014	0.0032	0.0009	0.7075	0.0567
Cattle_SE	12	4.93	0.003	0.0015	0.003	0.001	0.6791	0.0562
Cattle_SP	12	4.95	0.003	0.0015	0.003	0.001	0.676	0.0562
Swine	13.5	4	0.0042	0.0012	0.0026	0.0008	1	0.0387
Sheep	22	3.8	0.0033	0.0011	0.0077	0.0008	1	0.0361
Horse	12	2.7	0.0006	0.0004	0.0054	0.0009	1	0.153
Goats	22	3.8	0.0033	0.0011	0.0077	0.0008	1	0.0361

Table 7-6. Variables in the Grazing Events table .

Field	Definition
Fips	County ID
Psu_id	Sample Point ID
CropYear	Year of harvest of crop
Crop	Crop ID
Graze	Set to 1 if crop history indicates any grazing
Graze_Type	1= pre-harvest graze followed by regular harvest (387 events)
	2= pre-harvest graze out (361 events)
	3= post-harvest graze, no pre harvest graze (1884 events)
	4= pre- and post-harvest graze with regular harvest (89 events)
	5= pre- and post-harvest graze with graze out (11 events)
Acres	total acres of crop in field
AcresHarv	acres harvested
TypeLvstk_rep	Type of livestock:
	For 2004: 1=cattle; 2=sheep; 3=other (reset to 5 with query)
	For 2005-06: 1=cattle; 2=sheep; 3=goats; 4=horse; and 5=other
Animal_type	Cattle reassigned to dairy or beef if that source of manure used on field and all other cattle and other assigned to a “mixed” cattle by USDA farm production region
PreNos	Number of livestock for pre-harvest grazing
PreDays	Number of days of grazing for pre-harvest type
PostNos	Number of livestock grazing for post-harvest type
PostDays	Number of days of post-harvest grazing
PreDens	Calculated as number of livestock pre-grazing divided by number of acres
PostDens	Calculated as number of livestock post-grazing divided by number of acres
Harvester_used	If a machine harvest is used; helps determine grazing type.
Planter_used	Determine if the crop was planted in that crop year.
HrvDyMax	Day of last harvest machine used.
HrvMnMax	Month last harvest machine used.
HrvSeqMax	Operation sequence schedule number for last harvest machine
HrvDayJulian	Julian day for last harvest machine.
PlntYrMax	Year of last planter used.
PlntDyMax	Day of last planter used
PlntMnMax	Month of last planter used
PlntSeqMax	Operation sequence schedule number for last planter used
PlntDayJulian	Julian day for the last planter used.
StopPostJulian	Calculated as Julian harvest date plus days of after harvest grazing
StopPostJulianNxt	Like previous, but for grazing periods carrying over to next year.

Table 7-7. Count of grazing by crop group and type of grazing.

Crop Group	Pre-harvest, then traditional	Pre-harvest, graze out	Post-harvest, no pre-harvest	Pre- and Post-harvest, then tradtional	Pre- and Post harvest with graze out	Total	Percent
Other			9			9	0.3
Barley - all			58	3		61	2.3
Beans -Peas	1					1	0.0
Beans-Peas			8			8	0.3
Corn - all	8	7	783	4		802	30.1
Cotton			4	3		7	0.3
Forage	48	44	332	37	4	465	17.4
Grass Seed	10		20	10		40	1.5
Millet		4	14		1	19	0.7
Oats	2	19	28	1		50	1.9
Peanuts			3			3	0.1
Rice	1		19			20	0.8
Rye		20	11		1	32	1.2
Sorghum - all	7	7	93	4		111	4.2
Soybeans	2		209	2		213	8.0
Sugarbeets			8			8	0.3
Sunflowers			6			6	0.2
Vegetables			4			4	0.2
Wheat -all	308	209	251	25	5	798	29.9
Wheat Relatives	1	4	4			9	0.3
Total	388	314	1864	89	11	2666	100
Percent	14.6	11.8	69.9	3.3	0.4	100	

Table 7-8. Count of grazing by River Basin and type of grazing.

River Basin (HUC2)	River Basin Name	Pre-harvest, then traditional	Pre-harvest, graze out	Post-harvest, no pre-harvest	Pre- and Post-harvest, then tradtional	Pre- and Post harvest with graze out	Total	Percent
2	Mid Atlantic Region	1	3	16	3		23	0.9
3	South Atlantic-Gulf Region		12	20	5	1	38	1.4
4	Great Lakes Region	2	4	20	5		31	1.2
5	Ohio Region		1	64	7		72	2.7
6	Tennessee Region			2	1		3	0.1
7	Upper Mississippi Region	2	2	203	3		210	7.9
8	Lower Mississippi Region	1	6	17	3		27	1.0
9	Souris-Red-Rainy Region			10	1		11	0.4
10	Missouri Region	30	28	1123	9	2	1192	44.7
11	Arkansas-White-Red Region	258	148	108	22	6	542	20.3
12	Texas-Gulf Region	43	99	37	5	2	186	7.0
13	Rio Grande Region	10	5	7	4		26	1.0
14	Upper Colorado Region		3	17	1		21	0.8
15	Lower Colorado Region	1		9	2		12	0.5
16	Great Basin Region		1	65			66	2.5
17	Pacific Northwest Region	31	1	132	17		181	6.8
18	California Region	9	1	14	1		25	0.9
	Total	388	314	1864	89	11	2666	100
	Percent	14.6	11.8	69.9	3.3	0.4	100	

Any crop in a sample may have had several types of grazing.

Table 7-9. Count of grazing byLivestock Class and type of grazing.

Livestock Class	Region	Pre-harvest, then traditional	Pre-harvest, graze out	Post-harvest, no pre-harvest	Pre- and Post-harvest, then tradtional	Pre- and Post harvest with graze out	Total	Percent
Beef		10	18	136		1	165	6.2
Cattle_AP	appalachia		5	33	9		47	1.8
Cattle_CB	cornbelt	1	2	247	5		255	9.6
Cattle_DLT	deltastate	1	8	13	2		24	0.9
Cattle_LKS	lakestate	3	3	46	7		59	2.2
Cattle_Mnt	mountain	31	24	417	10		482	18.1
Cattle_NE	northeast			6			6	0.2
Cattle_NP	northplain	62	26	691	7	2	788	29.6
Cattle_PAC	pacific	1		63	5		69	2.6
Cattle_SE	southeast		9	16	3		28	1.1
Cattle_SP	southplain	220	205	70	23	4	522	19.6
Dairy		7	7	68	4	1	87	3.3
Goats		1					1	0.0
Horse		7	2	11	2	3	25	0.9
Sheep		44	5	47	12		108	4.1
Total		388	314	1864	89	11	2666	
Percent		14.6	11.8	69.9	3.3	0.4	100	

Cattle represent a mix of dairy and beef, based on Census of Agriculture Data.

Table 9-1. Sugar cane rotation data assignments for the 2003-2004 samples[a].

Survey Year	fips	psu_id	1998	1999	2000	2001	2002	2003	2004
2003	22005	86D05321		AddP	AddH	AddH	AddH	AddH	
2003	22005	87A09021		AddP	AddH	AddH	AddH	AddH	
2003	22009	32A01721		AddH	AddH	AddP	AddH	AddH	
2003	22019	78C01741		CopyH	CopyH	H	H	Fallow	AddP
2003	22039	33B11211		AddP	CopyH	H	H	H	
2003	22045	07A01342		AddH	AddH	AddP	AddH	AddH	
2003	22045	08B14441		CopyH	CopyH	Fallow	P	H	CopyH
2003	22045	84C00441		CopyH	AddFallow	AddP	H	H	CopyH
2003	22053	70D10911		AddP	AddH	AddH	AddH	Fallow	
2003	22055	82D06411		CopyH	CopyH	Fallow	P	H	CopyH
2003	22057	03C14011	AddP	CopyH	CopyH	H	H	H	CopyH
2003	22097	31C06111		AddP	CopyH	H	H	H	
2003	22099	83B12611		AddP	CopyH	H	Fallow	Fallow	
2003	22099	83C08941	AddP	CopyH	CopyH	H	H	H	CopyH
2003	22101	07C03411		AddP	CopyH	H	CopyH	H	
2003	22101	27B05232			AddP	H	H	H	
2003	22113	82C13711		AddP	CopyH	H	H	H	
2003	22113	82D03821		AddP	CopyH	CopyH	H	H	
2003	22121	64B12311		AddP	CopyH	H	H	H	
2003	48061	030406G1		AddP	CopyH	H	H	H	
2003	48489	020302G1	AddP	CopyH	CopyH	H	H	Cotton	
2004	22007	04A07211			AddP	AddH	AddH	AddH	AddH
2004	22007	04C08311			CopyH	CopyH	H	P	H
2004	22045	08B12232			CopyH	CopyH	H	AddP	H
2004	22045	83D12423			AddP	CopyH	H	H	H
2004	22045	84C13711			AddP	AddH	AddH	AddH	AddH
2004	22057	04C10511			CopyH	CopyH	H	P	H
2004	22057	31B05411			CopyH	CopyH	H	H	P
2004	22077	49C07911			AddP	CopyH	H	H	H
2004	22093	87D12411			AddP	CopyH	H	H	H
2004	22097	47B10511			AddP	CopyH	H	H	H
2004	22099	83B11611			AddP	CopyH	H	H	H
2004	22101	07C01041			AddP	CopyH	H	H	H
2004	22113	09A00121		CopyH	CopyH	CopyH	Fallow	P	H
2004	22113	82A00621			AddP	CopyH	H	H	H
2004	22121	64B12411			CopyH	CopyH	P	H	H
2004	48215	020401U1			AddP	AddH	AddH	AddH	AddH

[a]Definitions: "H" and "P" are harvest and plant years simulated as reported.
"CopyH" has data copied from a reported harvest year.
"AddP" and "AddH" have data for generic planting and harvest years added.
"Fallow" used the fallow year data reported.
"AddFallow" had generic fallow data added.
"Cotton" is for a year of cotton simulated as reported.

Table 9-2. Sugarcane rotations for the 2005 - 2006 samples.

Survey			Generic	Year of Rotation				
Year	**fips**	**psu_id**	**Planting[a]**	**1**	**2**	**3**	**4**	**5**
2005	22005	86D02911	1	Cane	Cane	Cane	Soybeans	Soybeans
2005	22007	04C08211	1	Cane	Cane	Cane	Cane	Cane
2005	22007	04C08331	0	Cane	Cane	Cane	Cane	Cane
2005	22007	86D05123	1	Cane	Cane	Cane	Cane	Cane
2005	22009	32B04011	1	Cane	Cane	Cane	Cane	Cotton
2005	22045	07A13313	0	Cane	Cane	Cane	Fallow	Cane
2005	22045	07C14311	1	Cane	Cane	Cane	Cane	Cane
2005	22045	83C07611	1	Cane	Cane	Cane	Cane	Cane
2005	22045	83D09913	1	Cane	Cane	Cane	Cane	Cane
2005	22047	63C14243	0	Cane	Cane	Cane	Soybeans	Cane
2005	22047	86A00711	1	Cane	Cane	Cane	Cane	Cane
2005	22055	82A02111	1	Cane	Cane	Cane	Soybeans	Fallow
2005	22057	31B05431	1	Fallow	Cane	Cane	Cane	Cane
2005	22093	87C08811	0	Cane	Cane	Cane	Cane	Cane
2005	22095	88D04011	1	Cane	Cane	Cane	Cane	Cane
2005	22097	47B10421	1	Cane	Cane	Cane	Cane	Cane
2005	22097	47B10431	1	Cane	Cane	Cane	Cane	Cane
2005	22097	67D03621	1	Cane	Cane	Cane	Cane	Cane
2005	22099	66D10722	1	Cane	Cane	Cane	Cane	Cane
2005	22101	06C08111	1	Cane	Cane	Cane	Cane	Cane
2005	22101	07C02141	1	Cane	Cane	Cane	Cane	Cane
2005	22113	09B04911	0	Cane	Cane	Cane	Cane	Cane
2005	22113	82C00321	1	Cane	Cane	Cane	Cane	Cane
2005	22113	82D03921	1	Cane	Cane	Cane	Cane	Cane
2005	22113	82D05122	1	Cane	Cane	Cane	Cane	Cane
2005	22121	49D10211	1	Cane	Cane	Cane	Cane	Cane
2006	12043	010501R1	0	Cane	Cane	Cane	Cane	Cane
2006	12051	040401R2	1	Cane	Cane	Cane	Cane	Silage
2006	22007	04A07212	1	Cane	Cane	Cane	Cane	Cane
2006	22007	04C08312	1	Cane	Cane	Cane	Cane	Cane
2006	22045	84C13712	1	Cane	Cane	Cane	Cane	Cane
2006	22057	04C10512	0	Cane	Cane	Cane	Cane	Cane
2006	22057	31B05412	1	Fallow	Cane	Cane	Cane	Cane
2006	22093	87D12413	1	Cane	Cane	Cane	Cane	Cane
2006	22099	83B11612	1	Cane	Cane	Cane	Cane	Cane
2006	22113	09A00123	0	Cane	Cane	Cane	Cane	Cane
2006	22121	64B12412	1	Cane	Cane	Cane	Cane	Cane

[a]All samples had at least one harvest year replicated from reported data.

Sample 22007_86D05123 had all management data copied from sample 22007_04C08331.

Table 10-10. List of 19 CEAP survey irrigation systems.

System Code	System Name	Pressure or Gravity
1	Hand-move	p
2	Solid or Permanent Set	p
3	Side Roll or Wheel Line	p
4	Center Pivot or Linear Move w/impact sprinkler	p
5	Center Pivot or Linear Move w/low pressure spray	p
6	Center Pivot or Linear Move w/near ground emiter	p
7	Big Gun	p
8	Low Flow Irrigation (drip,trikle,micro)	p
9	Other - specify	p
10	Siphon Tube from unlined ditch	g
11	Siphopn Tube from lined ditch	g
12	Porta lSystem from unlined ditch	g
13	Portal System from lined ditch	g
14	Any Poly Pipe sytem	g
15	Gated Pipe - not poly pipe	g
16	Improved Gated Pipe - surge or cable	g
17	Subirrigation	g
18	Open Discharge - see def	g
19	Other - specify	g

Table 10-2. Definition of CEAP gravity system water sources.

Gravity Source Code	Gravity Source name
1	furrow
2	border
3	basin
4	contourLevee
5	meadowWildFlood

Table 10-3. CEAP report of disposition of irrigation runoff.

Runoff Code	Runoff Name
1	retained at end of field w no reuse
2	retained at end and reused on farm
3	collected in on farm evap ponds
4	drained from farm
5	there is no runoff

Table 10-4. NRI report of source of irrigation water.

Source Code	Source Name
1	Well
2	Pond, lake, reservoir
3	Stream, ditch, canal
4	Lagoon, waste (not tailwater)
5	Combination

Table 10-5. NRI report of type of irrigation.

Irrigation Type Code	Irrigation Type Name
0	Not irrigated
1	Gravity irrigated
2	Pressure irrigated
3	Gravity and pressure

Table 10-6. APEX settings for auto-irrigation.

Variable	Setting	Explanation
Irrigation Rigidity	0	0 setting so that variable amount added when event triggered rather than maximum single application amount
Irrigation (Type)	0, 1, 2	0 for not irrigation 1 for pressurized systems 2 for gravity fed
Irrigation Trigger	0.95	On any day that actual growth would be less than 95% of potential growth due to water stress, trigger event
Minimum Auto Irrigation Interval	5	Minimum number of days between application events
Minimum Single Irrigation Application	20 mm	
Maximum Single Irrigation Application	150 mm	
Maximum Annual Irrigation Application	1200 mm	

Table 10-7. Conveyance and evaporation efficiencies (efm) and Field Operation ID by method of conveyance and use or not of Irrigation Water Management practice (IWM)[a].

		EFM				Field Operation ID			
		non- IWN		IWM		non- IWN		IWM	
CEAP ID	System Name	Ditch	Pipe	Ditch	Pipe	Ditch	Pipe	Ditch	Pipe
1	Hand Move	na	0.55	na	0.65	na	610	na	639
2	Solid or Permanent Set	na	0.65	na	0.75	na	611	na	640
3	Side Roll or Wheel Line	na	0.60	na	0.70	na	612	na	641
4	Center Piv. or Linear Mov - Impact Spray	na	0.75	na	0.80	na	613	na	642
5	Center Piv. or Linear Mov - Low Pressure Spray	na	0.85	na	0.85	na	614	na	643
6	Center Piv. or Linear Mov - Near Ground Emitters	na	0.90	na	0.90	na	615	na	644
7	Big Gun	na	0.50	na	0.60	na	616	na	645
8	Low Flow Irrigation (drip, trickle, micro)	na	0.95	na	0.95	na	617	na	646
9	Other_specify	na	0.70	na	0.72	na	618	na	647
10	Siphon Tube Unlined Ditch	0.85	0.88	0.87	0.90	600	619	629	648
11	Siphon Tube Lined Ditch	0.92	0.93	0.93	0.94	601	620	630	649
12	Portal system Unlined Ditch	0.85	0.88	0.87	0.90	602	621	631	650
13	Portal system Lined Ditch	0.92	0.93	0.93	0.94	603	622	632	651
14	Any Poly Pipe System	0.90	0.94	0.95	0.97	604	623	633	652
15	Gated Pipe (not poly pipe)	0.92	0.96	0.97	0.98	605	624	634	653
16	Improved Gated Pipe - surge or cable	0.91	0.93	0.94	0.96	606	625	635	654
17	Subirrigation	0.95	1.00	0.96	1.00	607	626	636	655
18	Open Discharge (see definitions)	0.80	0.85	0.85	0.90	608	627	637	656
19	Other specify	0.85	0.88	0.87	0.89	609	628	638	657

[a]The efm is proportion of water lost to evaporation and seepage in the system. Includes seepage in on-farm conveyance system to the point of discharge and sprinkler application evaporation.

Table 10-8. Expansion of CEAP irrigation system set to account for combinations of land leveling and reported source of irrigation water for gravity systems.

IrrSys	Graded Furrow	Graded Border	Basin	Flood
10	A	B	C	D
11	A	B		D
12	A	B	C	D
13	A	B	C	D
14	A	B		D
15	A	B		D
18	A	B	C	D

Graded Furrow: Gravity Source = Furrow (1) and (SlopeGrade = 1 or Practice 464)
Graded Border: Gravity Source = Border (2) and (SlopeGrade = 1 or Practice 464)
Basin: Gravity Source = Basin (3)
Flood: Gravity Source = Meadow/Wild Flood (5)

* Practice 464 = Irrigation Land Leveling

* This classification not applicable to systems 1 - 9 (pressurized) and systems 16, 17, and 19.

Table 10-9. Fraction of field capacity (FIRG) added by auto-irrigation event by situation.

CEAP ID	DM System	With CEAP Reported runoff		No-runoff, runoff not conveyed away, or null report: Other		HSG = A		HSG = D or slope >3%		HSG = D and slope >3%	
		none	IWM	none	IWM	none	IWM	none	IWM	none	IWM
1	1	1.00	1.00	1.05	1.05	1.00	1.00	1.08	1.08	1.10	1.11
2	2	1.00	1.00	1.05	1.05	1.00	1.00	1.08	1.08	1.10	1.11
3	3	1.00	1.00	1.05	1.05	1.00	1.00	1.08	1.08	1.10	1.11
4	4	1.00	1.00	1.05	1.05	1.00	1.00	1.08	1.08	1.10	1.11
5	5	1.00	1.00	1.03	1.03	1.00	1.00	1.04	1.04	1.05	1.05
6	6	1.00	1.00	1.02	1.02	1.00	1.00	1.03	1.03	1.04	1.04
7	7	1.00	1.00	1.08	1.08	1.03	1.03	1.11	1.11	1.14	1.14
8	8	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
9	9	1.00	1.00	1.05	1.05	1.00	1.00	1.08	1.08	1.10	1.11
10	10	1.25	1.18	1.56	1.18	1.39	1.31	1.67	1.44	1.84	1.57
10	10A	1.20	1.15	1.41	1.35	1.26	1.21	1.50	1.44	1.64	1.58
10	10B	1.15	1.12	1.35	1.32	1.21	1.18	1.44	1.40	1.58	1.53
10	10C	1.10	1.08	1.22	1.20	1.16	1.14	1.29	1.27	1.38	1.35
10	10D	1.30	1.22	1.85	1.63	1.62	1.44	2.00	1.74	2.06	1.79
11	11	1.25	1.18	1.56	1.39	1.39	1.31	1.67	1.48	1.84	1.69
11	11A	1.20	1.15	1.41	1.35	1.26	1.21	1.50	1.44	1.64	1.58
11	11B	1.15	1.12	1.35	1.32	1.21	1.18	1.44	1.40	1.58	1.53
11	11D	1.30	1.22	1.85	1.63	1.62	1.44	2.00	1.74	2.06	1.79
12	12	1.25	1.18	1.56	1.39	1.39	1.31	1.67	1.48	1.84	1.69
12	12A	1.20	1.15	1.41	1.35	1.26	1.21	1.50	1.44	1.64	1.58
12	12B	1.15	1.12	1.35	1.32	1.21	1.18	1.44	1.40	1.58	1.53
12	12C	1.10	1.08	1.22	1.17	1.16	1.14	1.29	1.20	1.38	1.27
12	12D	1.30	1.22	1.86	1.63	1.62	1.44	2.00	1.74	2.06	1.79
13	13	1.25	1.18	1.56	1.39	1.39	1.31	1.67	1.48	1.84	1.62
13	13A	1.20	1.15	1.41	1.35	1.26	1.21	1.50	1.44	1.64	1.58
13	13B	1.15	1.12	1.35	1.32	1.21	1.18	1.44	1.40	1.58	1.53
13	13C	1.10	1.08	1.22	1.20	1.16	1.14	1.29	1.27	1.38	1.35
13	13D	1.30	1.22	1.86	1.63	1.62	1.44	2.00	1.74	2.06	1.79
14	14	1.25	1.18	1.56	1.48	1.39	1.31	1.67	1.57	1.84	1.74
14	14A	1.20	1.15	1.41	1.35	1.26	1.21	1.50	1.44	1.64	1.58
14	14B	1.15	1.12	1.35	1.32	1.21	1.18	1.44	1.40	1.58	1.53
14	14D	1.30	1.22	1.86	1.63	1.62	1.44	2.00	1.74	2.06	1.79
15	15	1.25	1.18	1.56	1.48	1.39	1.31	1.67	1.57	1.84	1.74
15	15A	1.20	1.15	1.41	1.35	1.29	1.24	1.50	1.44	1.64	1.58
15	15D	1.15	1.12	1.35	1.32	1.24	1.20	1.44	1.40	1.58	1.53
15	15C	1.30	1.22	1.86	1.74	1.62	1.53	2.00	1.88	2.06	1.94
16	16	1.10	1.08	1.22	1.20	1.16	1.14	1.26	1.24	1.33	1.30
17	17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	18	1.25	1.18	1.56	1.39	1.39	1.31	1.67	1.48	1.84	1.57
18	18A	1.20	1.15	1.41	1.35	1.26	1.21	1.50	1.44	1.64	1.58
18	18B	1.15	1.12	1.35	1.32	1.21	1.18	1.44	1.40	1.58	1.53
18	18C	1.10	1.08	1.22	1.20	1.16	1.14	1.29	1.27	1.38	1.35
18	18D	1.30	1.22	1.86	1.63	1.62	1.53	2.00	1.74	2.06	1.79
19	19	1.25	1.18	1.56	1.39	1.39	1.31	1.67	1.48	1.84	1.57

Table 10-10. Matrix showing the count of assignments made for each set of FIRG criteria.

System and System Modifier	SlopeGrade = 1 or p464=1	IWM	Runoff Type (2,3,4)	Runoff Type (0,1,5,null) and Soil/Slope Condition: A	D or G3	D and G3	other
Systems (1,2,3,4,7,9,16,19):							
-	-	no	214	3	581	11	1301
-	-	yes	37	14	48	1	179
Systems (5,6,8,17):							
-	-	-	134	263	350	13	1480
Systems (10,11,12,13,14,15,18):							
A (IrrigSrc=1)	yes	no	204	6	46	0	96
A (IrrigSrc=1)	yes	yes	28	0	7	0	27
B (IrrigSrc=2)	yes	no	60	0	8	0	23
B (IrrigSrc=2)	yes	yes	4	0	0	0	1
C (IrrigSrc=3)	-	no	25	0	6	0	4
C (IrrigSrc=3)	-	yes	0	0	0	0	3
D (IrrigSrc=5)	-	no	44	0	8	0	21
D (IrrigSrc=5)	-	yes	12	0	0	0	3
null (IrrigSrc=0,4,null) or (no slope mod SRC 1,2)	-	no	911	29	633	4	720
null (IrrigSrc=0,4,null) or (no slope mod SRC 1,2)		yes	135	5	61	0	95

Count assigned 7858
of total 7858 cases

Table 10-11. Fraction of applied irrigation water running off end of field by situation.

		No IWM				IWM			
CEAP ID	DM System	Other	HSG=A	HSG=D or slope >3	HSG=D and Slope>3	Other	HSG=A	HSG=D or slope >3	HSG=D and Slope>3
1	1	0.05	0	0.07	0.1	0.05	0	0.07	0.1
2	2	0.05	0	0.07	0.1	0.05	0	0.07	0.1
3	3	0.05	0	0.07	0.1	0.05	0	0.07	0.1
4	4	0.05	0	0.07	0.1	0.05	0	0.07	0.1
5	5	0.03	0	0.04	0.05	0.03	0	0.04	0.05
6	6	0.02	0	0.03	0.04	0.02	0	0.03	0.04
7	7	0.07	0.03	0.1	0.12	0.07	0.3	0.1	0.12
8	8	0.01	0	0.01	0.01	0.01	0	0.01	0.01
9	9	0.05	0	0.07	0.1	0.05	0	0.07	0.1
10	10	0.2	0.1	0.25	0.32	0.15	0.1	0.18	0.25
10	10A	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
10	10B	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
10	10C	0.1	0.05	0.15	0.2	0.1	0.05	0.15	0.2
10	10D	0.3	0.2	0.35	0.37	0.25	0.15	0.3	0.32
11	11	0.2	0.1	0.25	0.32	0.15	0.1	0.2	0.3
11	11A	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
11	11B	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
11	11D	0.3	0.2	0.35	0.37	0.25	0.15	0.3	0.32
12	12	0.2	0.1	0.25	0.32	0.15	0.1	0.2	0.3
12	12A	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
12	12B	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
12	12C	0.1	0.05	0.15	0.2	0.08	0.05	0.1	0.15
12	12D	0.3	0.2	0.35	0.37	0.25	0.15	0.3	0.32
13	13	0.2	0.1	0.25	0.32	0.15	0.1	0.2	0.27
13	13A	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
13	13B	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
13	13C	0.1	0.05	0.15	0.2	0.1	0.05	0.15	0.2
13	13D	0.3	0.2	0.35	0.37	0.25	0.15	0.3	0.32
14	14	0.2	0.1	0.25	0.32	0.2	0.1	0.25	0.32
14	14A	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
14	14B	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
14	14D	0.3	0.2	0.35	0.37	0.25	0.15	0.3	0.32
15	15	0.2	0.1	0.25	0.32	0.2	0.1	0.25	0.32
15	15A	0.15	0.07	0.2	0.27	0.15	0.07	0.2	0.27
15	15D	0.15	0.07	0.2	0.27	0.15	0.07	0.2	0.27
15	15C	0.3	0.2	0.35	0.37	0.3	0.2	0.35	0.37
16	16	0.1	0.05	0.13	0.17	0.1	0.05	0.13	0.17
17	17	0	0	0	0	0	0	0	0
18	18	0.2	0.1	0.25	0.32	0.15	0.1	0.2	0.25
18	18A	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
18	18B	0.15	0.05	0.2	0.27	0.15	0.05	0.2	0.27
18	18C	0.1	0.05	0.15	0.2	0.1	0.05	0.15	0.2
18	18D	0.3	0.2	0.35	0.37	0.25	0.2	0.3	0.32
19	19	0.2	0.1	0.25	0.32	0.15	0.1	0.2	0.25

Table 10-12. Matrix showing the count of assignments made for each set of runoff criteria.

System and System Modifier	SlopeGrade = 1 or p464=1	IWM	Soil/Slope Condition A	D or G3	D and G3	other
Systems (9,19):						
-	-	no	0	15	0	32
-	-	yes	0	0	0	7
Systems (1,2,3,4,5,6,7,8,16,17):			3	78	2	112
-	-	-				
Systems (10,11,12,13,14,15,18):						
A (IrrigSrc=1)	yes	assume all	0	47	0	111
B (IrrigSrc=2)	yes	assume all	0	27	0	18
C (IrrigSrc=3)	-	none	3	11	0	1
D (IrrigSrc=5)	-	no	0	19	0	17
D (IrrigSrc=5)	-	yes	0	2	0	9
null (IrrigSrc=0,4,null) or (no slope mod SRC 1,2)	-	no	9	374	1	317
null (IrrigSrc=0,4,null) or (no slope mod SRC 1,2)	-	yes	3	34	0	69

Count assigned 1321
of total 7858 cases

Table 10-13. Final FIRG values after adjusting for salinity leaching requirement.

Managed for Salnity	Irrigation Water Management	CEAP survey runoff report	Count	Final FIRG
No	No	Null	1,515	1.32
No	No	Reported "0"	255	1.36
No	No	1 retained at end of field with no re-use	311	1.43
No	No	2 retained and re-used to irrigate on the farm	305	1.20
No	No	3 collected in evaporation ponds on the farm	76	1.15
No	No	4 drained from the farm	976	1.20
No	No	5 there is no runoff	2,724	1.12
No	Yes	Null	164	1.23
No	Yes	Reported "0"	27	1.20
No	Yes	1 retained at end of field with no re-use	45	1.40
No	Yes	2 retained and re-used to irrigate on the farm	35	1.12
No	Yes	3 collected in evaporation ponds on the farm	4	1.07
No	Yes	4 drained from the farm	142	1.14
No	Yes	5 there is no runoff	545	1.06
Yes	No	Null	82	1.55
Yes	No	Reported "0"	10	1.29
Yes	No	1 retained at end of field with no re-use	46	1.40
Yes	No	2 retained and re-used to irrigate on the farm	39	1.20
Yes	No	3 collected in evaporation ponds on the farm	10	1.22
Yes	No	4 drained from the farm	165	1.21
Yes	No	5 there is no runoff	236	1.26
Yes	Yes	Null	12	1.37
Yes	Yes	Reported "0"	8	1.33
Yes	Yes	1 retained at end of field with no re-use	8	1.30
Yes	Yes	2 retained and re-used to irrigate on the farm	15	1.17
Yes	Yes	3 collected in evaporation ponds on the farm	3	1.18
Yes	Yes	4 drained from the farm	38	1.17
Yes	Yes	5 there is no runoff	62	1.26
Total			7,858	

Table 12-1. Assignment of CRP FSA practices to CEAP CRP Cover Types.

CRP FSA practice	Description	CEAP CRP	Definition
CP1	Introduced Grasses	1	Introduced Grass
CP2	Native Grasses	2	Native Grass
CP3sh	Tree Planting	3	Mixed Trees
CP3s	Tree Planting - softwoods	4	Softwood Trees
CP3h	Tree Planting - hardwoods	5	Hardwood Trees
CP4r	Wildlife habitat - whole fields (r or w)	6	Wildlife Habitat
CP4s	Wildlife habitat - corridors	6	Wildlife Habitat
CP5	Field windbreaks		
CP6	Diversions		
CP7	Erosion control structures		
CP8	Grass waterways		
CP9	Wildlife water (shallow water for wildlife)		
CP10	Established grass	1	Introduced Grass
CP11	Established trees	3	Mixed Trees
CP12	Wildlife food plot	6	Wildlife Habitat
CP13gt	Filter strips - grass and trees		
CP13g	Filter strips - grass		
CP13t	Filter strips - trees		
CP14	Wetland trees		
CP15	Contour grass strips		
CP16	Shelterbelts		
CP17	Living snow fences		
CP18	Salinity reducing/tolerant veg.		
CP19	Alley cropping		
CP21	Filter strips		
CP22	Riparian buffers		
CP23	Wetland restoration		
CP24	Cross wind trap strips		
CP25	Rare and declining habitat		
CP26	Sediment retention structures		
CP27	Farmable Wetland Program - Wetland		
CP28	Farmable Wetland Program - Upland		
CP29	Marginal Pasture - Wildlife Habitat		
CP30	Marginal Pasture - Wetland Buffer		
CP31	Bottomland Hardwood trees		

Table 12-2. NRI CRP cover types assigned to CEAP CRP cover types.

CRP NRI cover	description	CEAP CRP Cover	Definition
1	Grasses and Legumes	1	Introduced Grasses
2	Trees	3	Mixed Trees
3	Wildlife and components	6	Wildlife and components
4	Shallow water cover		
5	Native grasses	2	Native Grasses

Table 12-3. Assignment of 2003 NRI CRP points to CEAP CRP cover typesby cover and practice type.

				CEAP	CRP	Cover Type			
		Intro.	Native	General	Softwood	Hardwood	Wildlife		
	[c]Not	Grass	Grass	Trees	Trees	Trees	Habitat		
Cover rule[a]	**Assigned**	**1**	**2**	**3**	**4**	**5**	**6**	**Total**	**Percent**
Count of Survey Points:									
Not assigned	50							50	0.4
1 CP01 Introduced Grasses		808						808	6.1
2 CP02 Native Grasses			1,225					1,225	9.3
4 CP03S Softwood Trees					50			50	0.4
5 CP03H Hardwood Trees						109		109	0.8
6 CP04r Wildlife Habitat - fields							528	528	4.0
7 CP04s Wildlife Habitat - corridors							2	2	0.0
8[b] CP10 Established Grass		3,211						3,211	24.4
9 CP11 Established Trees				195				195	1.5
10 CP12 Wildlife Food Plot							6	6	0.0
11 NRI03=1 Grasses and Legumes		5,582						5,582	42.4
12 NRI03=2 Trees				692				692	5.3
13 NRI03=3 Wildlife and Comp.							330	330	2.5
14 NRI03=5 Native Grasses			390					390	3.0
Total	50	9,601	1,615	887	50	109	866	13,178	100
Percent	0.4	72.9	12.3	6.7	0.4	0.8	6.6	100	
Sum of Acres (1000s):									
Not assigned	132.1							132	0.4
1 CP01 Introduced Grasses		1871.1						1,871	5.9
2 CP02 Native Grasses			3919.3					3,919	12.5
4 CP03S Softwood Trees					112.3			112	0.4
5 CP03H Hardwood Trees						268.2		268	0.9
6 CP04r Wildlife Habitat - fields							1377.8	1,378	4.4
7 CP04s Wildlife Habitat - corridors							2.2	2	0.0
8[b] CP10 Established Grass		7858.1						7,858	25.0
9 CP11 Established Trees				409.6				410	1.3
10 CP12 Wildlife Food Plot							10.1	10	0.0
11 NRI03=1 Grasses and Legumes		12074						12,074	38.4
12 NRI03=2 Trees				1567.5				1,568	5.0
13 NRI03=3 Wildlife and Comp.							787.6	788	2.5
14 NRI03=5 Native Grasses			1076.1					1,076	3.4
Total	132	21,804	4,995	1,977	112	268	2,178	31,466	100.0
Percent	0.4	69.3	15.9	6.3	0.4	0.9	6.9	100	

[a]Rules 1 -1 4 were applied sequentially with the following criteria for each:
Assigned CEAP CRP cover is still null:
If 2003 FSA data, then variable for listed practice equal "1"; or
If 2004 FSA data, then acres for listed practice at least 50% of sum of acres for all practices; or
If 2006 FSA data, then acres for listed practice at least 50% of total acres of field of the point.

[b]Established grass (pre-existing grass cover) assigned as Introduced Grass.

[c]All 50 unassigned points were "shallow water" in the 2003 NRI; and of these 50,
24 were in the FSA practice data, classed as "CP23 Wetland Restoration.
Query sources: "crosstab covers and rules points", "crosstab covers and rules acres"

Table 12-4. CRP acreage by River Basin and cover type (1000 acres).

CEAP Basins	Description	2-digit HUC	[c]Not modeled	CEAP CRP Cover Type: Intro. Grass 1	Native Grass 2	General Trees 3	Softwood Trees 4	Hardwood Trees 5	Wildlife Habitat 6	Total	Percent
3	South Atlantic Gulf	03		261.8	3.9	971.6	42.3	84.0	26.7	1,390.3	4.4
4	Great Lakes	04		449.7	43.6	30.5	3.0	17.0	51.2	595.0	1.9
7	Upper Mississippi	07	31.5	1,935.1	338.3	111.7	0.6	56.6	360.3	2,834.1	9.0
8	Lower Mississippi	08	2.4	315.7	22.7	546.0	46.5	80.4	20.1	1,033.8	3.3
9	Souris Red Rainy	09	69.1	1,623.0	122.4	52.7			533.3	2,400.5	7.6
10	Missouri River	10	25.9	8,546.2	1,757.7	38.9	1.5	13.3	783.1	11,166.6	35.5
11	Arkansas White Red	11		4,098.2	1,320.0	70.8			72.6	5,561.6	17.7
12	Texas Gulf Coast	12		1,730.5	807.8	10.8				2,549.1	8.1
17	Pacific North West	17		1,507.3	485.2	19.3	2.8		247.9	2,262.5	7.2
100	Northeast Mid Atlantic	01		17.1			12.6			29.7	0.1
100	Northeast Mid Atlantic	02		75.0	1.0	27.9	1.9	2.4	5.1	113.3	0.4
200	Ohio Tennessee	05		527.6	32.4	63.8	1.1	14.5	24.6	664.0	2.1
200	Ohio Tennessee	06		78.6	11.9	16.5			5.8	112.8	0.4
300	Western	13		153.4	32.3					185.7	0.6
300	Western	14		70.2	10.2	16.6			2.0	99.0	0.3
300	Western	15		2.3						2.3	0.0
300	Western	16		307.1	6.0				15.1	328.2	1.0
300	Western	18	3.2	104.8					29.9	137.9	0.4
	Total		132.1	21,803.6	4,995.4	1,977.1	112.3	268.2	2,177.7	31,466.4	100.0
CEAP Grouped Basin Totals											
100	Northeast Mid Atlantic			92.1	1.0	27.9	14.5	2.4	5.1	143.0	0.5
200	Ohio Tennessee			606.2	44.3	80.3	1.1	14.5	30.4	776.8	2.5
300	Western		3.2	637.8	48.5	16.6			47.0	753.1	2.4

Table 12-5. Specie mix by Land Resource Region and CEAP CRP cover type.

	Land Resource Regions																			
Full Name	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**R**	**S**	**T**	**U**
Introduced Grasses:																				
Big Blue Stem grass															1					
Brome grass mountain	1	1		1	1	1	1				1	1		1						
Brome grass smooth								1					1							
Calif Annual grass			1																	
Coastal Bermuda																			1	1
Medium Prairie grass									1	1										
Orchard grass											1									
Tall Prairie grass																1				
Timothy																	1	1		
Native Grasses:																				
Brome grass mountain	1	1		1	1	1	1				1	1					1			
Calif Annual grass			1																	
Medium Prairie grass								1												
Orchard grass																		1		
Switch grass																			1	1
Tall Prairie grass									1	1			1	1	1	1				
Trees - general:																				
Ash tree					1			1			1	1	1	1			1			
Brome grass mountain	1			1	1	1	1	1			1	1								
Brome grass smooth													1							
Calif Annual grass			1																	
Oak tree			1	1			1		1	1					1	1		1	1	1
Orchard grass		1																		
Pine tree	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switch grass																			1	1
Tall Prairie grass									1	1				1	1	1				
Timothy																	1	1		
Softwood Trees:																				
Brome grass mountain	1	1		1	1	1	1				1	1	1					1		
Calif Annual grass			1																	
Medium Prairie grass								1												
Orchard grass													1							
Pine tree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switch grass																			1	1
Tall Prairie grass									1	1				1	1	1				
Timothy																	1			
Hardwood Trees:																				
Ash tree											1	1					1	1		
Brome grass mountain				1	1	1	1				1	1					1	1		
Calif Annual grass			1																	
Medium Prairie grass								1												
Oak tree			1	1					1	1			1	1	1	1			1	1
Orchard grass	1																			
Popular tree				1	1	1	1	1												
Sweet Gum	1																			
Switch grass																			1	1
Tall Prairie grass									1	1			1	1	1	1				
Wildlife Habitat:																				
Ash tree								1				1	1				1	1		
Big Blue Stem grass																			1	
Brome grass mountain	1	1		1	1	1	1	1	1		1	1						1		
Lespedeza															1	1			1	
Oak tree			1	1	1	1	1		1	1	1			1					1	1
Pine tree	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1			1	1
Popular tree			1																	
Red Clover	1	1		1	1	1	1	1	1		1	1	1	1			1	1		
Switch grass																				1
Tall Prairie grass										1				1	1	1				
Timothy																	1			

*All mixes also include a clover at low density.

Table 12-6. Harvest Ages for CRP Trees (years).

Land Resource Region		Ash tree	Oak tree	Pine tree	Poplar tree	Sweet Gum
A	NW forest, forage, and spec. crops	60	60	50	30	60
B	NW wheat and range	80	80	70	50	80
C	CA subtropical fruit, truck, and spec. crops	50	50	40	30	50
D	Western range and irrigated crops	80	80	80	60	80
E	Rocky Mountain range and forest	80	80	70	60	80
F	Northern Great Plain spring wheat	80	80	70	60	80
G	Western Great Plain range and irrigated	80	80	70	60	80
H	Central Great Plain winter wheat and range	60	60	50	60	60
I	SW plateaus and plains, range and cotton	60	60	50	50	60
J	SW prairies cotton and forage	60	60	40	40	60
K	Northern Lakes forest and forage	70	70	60	50	70
L	Lake States fruit, truck, and dairy	60	60	50	40	60
M	Central feed grains and livestock	70	70	60	40	70
N	East and Central farming and forest	80	80	60	40	80
O	Mississippi Delta cotton and feed grains	50	50	40	30	50
P	S. Atlantic & Gulf Slope cash crop, forest, livestock	50	50	40	30	50
R	NE forest and forage	70	70	60	50	70
S	N. Atlantic Slope diversified farming	50	50	40	40	50
T	Atlantic & Gulf Coast lowland forest and crop	50	50	40	30	50
U	Florida subtrop. Fruit, truck, and range	40	40	40	50	40

Table 12-7. Generic CRP Operation Schedules

Schedule ID	System Name	Seq	Operation year[a]	month	Machine Code	Operation Purpose	Machine
1	Seeded Plants	1	0	4	105	Plant	Drill-No-till, Minimum till
2	Sprigged Grass	1	0	4	108	Plant	Planter - Sprig planter
3	Trees	1	0	4	438	Plant	Hole Punch Tree Plant
3	Trees	2	1	10	437	Harvest	ClearCut
3	Trees	3	1	10	401	Harvest	Kill

[a]This value plus 1 for planting; value multiplied by harvest age for trees, plus 1.

Table 12-8. Field Operation Schedule assignments by specie.

CEAP crop ID	crop name	Generic CRP Operation Schedule
403	Red Clover	1
404	Timothy	1
405	Bromegrass Mountain	1
406	Bromegrass Smooth	1
407	Coastal Bermuda	2
408	Pine Tree	3
409	Popular Tree	3
410	Sweet Gum	3
411	Switch Grass	1
412	Big Blue Stem grass	1
413	Lespedeza	1
414	Orchard grass	1
415	Ash Tree	3
416	Oak Tree	3
417	Tall Praire grass	1
418	Med Prairie grass	1
419	Short Prairie grass	1
420	Desert Grass	1
421	Calif Annual grass	1

Table 12-9. Code definitions for CRP cropland donor criteria in UMRB.

Code Component	Matching criteria for CRP and donor cropland points	Detailed criteria
hydro8	same 8-digit watershed	
hydro6	same 6-digit watershed	
CMZ	same Crop Management Zone	
st	in ssme state	
Class5code	same one of 5 soil texture groups	Coarse Moderately Coarse Medium Moderately Fine Fine
Class3Code	same one of 3 soil texture groups	Sandy Loamy Clayey
HydGroup	same Hydrologic Group	A - Low Runoff Potential B Moderate Infiltration when wet C Slow infiltration when wet D - High Runoff Potential
SlopeClass	same slope class	0-2% 2-6% 6-12% 12-20% >20%

Table 12-10. Source of data elements for the CRP donor simulations.

Data Element	Baseline Source	Scenario Source
Field Operations	cropland donor	cropland donor
Fertilizer applications	cropland donor	cropland donor
Manure applications	cropland donor	cropland donor
Pesticide applications	cropland donor	cropland donor
Irrigation	cropland donor	cropland donor
P-factor	cropland donor	cropland donor
other structural practices	cropland donor	cropland donor
Wind erosion factors	cropland donor	cropland donor
Field/subarea size/layout	cropland donor	cropland donor
Grazing information	cropland donor	cropland donor
Use of cover crops	cropland donor	cropland donor
Slope	CRP point	CRP point
Slope length	CRP point	modified?
Soil ID	CRP point	CRP point
Weather	CRP point	CRP point
Drainage	Cropland donor	Cropland donor

Table 13-1. Pesticide information supplied by CEAP surveys 2003-2006

Survey supplied information	Input used in APEX modeling
FIPS	yes
PSUID	yes
Crop type	yes
Crop year	yes
Product Code	no
Product Application Rate	no
AI Code (EPA pc code pesticide identifier)	yes
Tank-mix	no
Application Date (2003 only provided month/year)	yes
Application Method	yes
AI Application Rate	yes