# POULTRY NUTRIENT MANAGEMENT PLAN

Prepared for

THIS SCENARIO IS FOR TRAINING PURPOSES AT PART 3 OF THE KENTUCKY NUTRIENT MANAGEMENT TRAINING SESSION ON February 4, 2004 IN LEXINGTON, KENTUCKY.



ES00-049



in

County, Kentucky

# Livestock Plans:

Poultry - The farm has two broiler houses with 26,000 capacity each.

Each flock is in the house for 46 days on average.

The average live weight of broilers is 2.5 pounds.

An average of 6.5 flocks are produced each year.

The farm has a litter storage building that can hold all the between flock (cake) litter for a year.

Assume a full years' production of litter will be available to use with a full house cleanout starting in March, 2004.

Beef Cow-Calf – There is a herd consisting of 55 brood cows and two bulls.

Cattle are not confined and manure is deposited on pasture fields.

Pasture fields are tall fescue. Assume an average yield of four tons per acre.

Pasture/Hay field is orchardgrass and red clover. A cutting of hay is taken in May (2.5 tons/acre average yield) which is fed back to the cow herd in winter. The field is grazed when forage growth is sufficient. Average of 1.5 tons per acre for grazing.

## **Application Timing**

A key component of land application is timing. Manure must be applied as close to planting as possible or when the crop is actively growing in such a way as to prevent it from entering streams, other water bodies, and environmentally sensitive areas. Timing is indicated in Worksheet 3 of Appendix A.

# Soil Testing

Soil tests should be utilized to develop this plan after the first year of operation (unless current soil test information is available in year one. Soil nutrient levels should be monitored by soil testing to determine the buildup of phosphorus and potassium in the soil. Soil test analysis must include pH, phosphorus, and potassium. Soil amendments shall be applied to adjust pH to specific range of the crop for optimum utilization of nutrients. **Routine soil testing by field should occur annually when nutrients in the form of commercial fertilizers or animal manures are land applied during the crop year.** 

Soil samples are to be collected in accordance with The University of Kentucky extension service guidance. Soil testing is to be performed by laboratories that meet <u>all</u> of the following:

- Certification In The North American Proficiency Testing Program (Soil Science Society of America)
- Other laboratories whose test results are accepted by The University of Kentucky
- Soil Test Phosphorus (STP) is determined by the Mehlich III method

Soil profile sampling for nitrogen, Pre-Sidedress Nitrogen Test (PSNT), Pre-Plant Soil Nitrate (PPSN) or soil surface sampling for phosphorus or acidity may be necessary in situations where there are special production or environmental concerns.

### **Litter Testing**

When an analysis of the litter becomes available, a more accurate application rate can be determined using Worksheet 2 in Appendix A of this plan. Testing of the litter and compost should include an analysis for Total Nitrogen and Total Phosphorus. The results should be obtained in pounds of nutrients per ton of litter. Annual testing of litter is not required unless management changes occur that impact the number of animal units, manure storage method, manure storage frequency, feed rations or other feature that could alter the analysis data collected in a prior year.

Procedures for collecting samples of litter are provided in Appendix B of this plan. Call the local NRCS, Conservation District or Extension office after receiving the manure analysis report for assistance in determining an actual application amount.

### Land Application Operation and Maintenance Requirements

- 1) If the crop, method of application, feed ration or consistency of manure changes, it will be necessary to re-calculate an appropriate application amount using Worksheet 2 in Appendix A.
- 2) Litter shall not be applied on saturated, frozen and/or snow-covered soil.
- 3) Litter will not be spread in an established waterway or any defined drainageway that carries concentrated flow. Litter may be applied to newly constructed grass waterways if incorporated immediately.
- 4) Litter should not be applied on land that is subject to occasional or frequent flooding unless the litter is incorporated immediately.
- 5) Incorporating litter into the soil versus surface application can reduce odors.
- 6) Maintain crop residue on ground surface as prescribed in the HEL compliance plan.
- 7) Equipment shall be calibrated to ensure uniform distribution of litter at recommended rates.
- 8) Buffer areas should be maintained around fields receiving litter. The following information refers to guidance for maintaining non-application buffer widths in accordance with Kentucky BMP#17.

# **PLAN AGREEMENT**

#### Name of Farm: \_

The Kentucky Department For Environmental Protection Division of Water (DOW) acting under the authority of the Clean Water Act of 1972 requires that animal byproducts (manure, feedlot or holding area runoff, milkhouse supernatant, silo drainage, etc.) be managed so as not to enter the waters of the State. This Nutrient Management Plan provides the basic information on how the manure produced from your operation, and/or applied on your fields, will be utilized. Following this plan will keep you in compliance with the State of Kentucky Water Quality Regulations. Is this plan considered to be part of a Comprehensive Nutrient Management Plan (circle Yes or No). If **YES**, this plan is considered to be part of a Comprehensive Nutrient Management Plan and other planning components could apply that may not be referenced in this document.

#### **Owner/Manager Agreement**

I (we) understand and will follow and implement this plan for the farm named above. I (we) know that any expansion of greater than 10% to the existing design capacity of the system will require a revised plan and possibly a new or revised permit. I (we) understand that there must be no discharge of manure or other contaminated runoff from the manure handling system from any storm less than the 25 year, 24 hour storm event. The approved plan should be filed on-site at the farm office. When implementation of this plan is a required component of a regulatory permit or is mandated by other regulations, I will assume all responsibility for compliance.

### Signatures:

#### **Owner Information (Persons Responsible For Plan Implementation):**

Print Name:			
Signature:		Date:	
Print Name of Manager (if differen	t from owner):		
Signature:		Date:	
Nutrient Management Plan De	eveloper Information:	(Enter information for a	II applicable items)
USDA-NRCS Employee Certification	n Number		
State or Federal Employee Certific	ation Number		
Kentucky NRCS Third Party Vendo	r Certification Number _	······	
Print Name:	Address:		С. с. с
Signature:		Date:	

Litter sold or given away must be documented by the producer. The recipient should keep the same records as the producer for fields where litter is applied.

# WORKSHEET 2 - NUTRIENT BALANCE

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Tract     Field No.     Acres     Soil Test P Value (Mehlich 3)						
Crop or Crop Sequence/Rotatio	n	[				
, crop of crop bequence, Roundo		L				
2. Realistic Yield Goal						
		N	P O	K O		
3 Plant Nutrients Needed or Allow	ved (lbs/ac)		F 205	120		
(based on soil tests (ST) or crop removal (CR	) rates in Table 6)					
NOTE: Plant Nutrient Needs for "N" cannot e	xceed a one year crop					
sequence (e.g., com/wheat in a com/wheat/s	oybean sequence)					
When based on crop removal, nucherics neede	a are based on yield level.					
4. If applicable, adjusted P <sub>2</sub> O <sub>5</sub> App	plication Rate	UHHHHHMM	0	AMMANNAN AN		
according to Threshold or P Ind	ex.					
Step 3 $P_2O_5 \times U$						
5. Nitrogen Credits from previous	legume crop	0	anna an	HANNIN MARKE		
(Ibs/ac. from Table 4)						
6 Fertilizer Credits (Starter or Other) (	lbs/ac)	0	0 1	0		
		Lŭ				
7. Nitrogen credits for previous ma	anure applications	0	AIIMMMMMM.	HAMMAN HAMAN		
(lbs/ac) Table 5 value x net applica	ation of manure nutrients					
<b>§.</b> Plant Nutrients Needed minus	Credits (Ibs/ac)	0	0	0		
/ (Step 3 for N minus Steps 5, 6, & 7 or Step 4 for	or P <sub>2</sub> O <sub>5</sub> minus Step 6)					
9. Nutrients in Manure (lbs/ton) Circl	e: colids Liquids	60.00	70.00	40.00		
(Use lab test <i>or</i> weighted value as determine	ed in Worksheet 1)	22				
10. Percent Nutrients Retained in	System (Table 2)	100%	100%	100%		
Enter Table value as a decimal. (Enter zero w	vith lab analysis)					
11. Net Retained Nutrients in Man (Step 9 v Step 10) Enter zero with lab analysis	ure (lbs./ton)	60	70	40		
12. Percent of available nutrients	(Table 3)	0%	0%	0%		
13 Net available nutrients (lbs./to	( <b>n</b>	[				
(Step 11 x Step 12 without lab analysis. Step	9 x Step 12					
with lab analysis)						
14. APPLICATION RATE (tons/ac)						
(Step 8 / Step 13)		L				
Note: Application limitations may apply. See	<b></b>	· . ·				
ISten 13 x Sten 14]	nucrents (lbs/ac)	L				
16. Nutrient Needs or Surpluses (lbs	s/ac)		· .			
(Step 15 minus Step 8) "-" sign indicates ner	ed		-			
Tons Available	-Tons Applied in Field		=Balance	3		
Cake	(Step 14 x Field Acres)		- Durance			

# WORKSHEET 2 - NUTRIENT BALANCE

٦	ract	Field No.	Acres	Soil Test P	Value	(Mehlich 3	3)	]
-								
)	Crop	or Crop Se	quence/Rotat	ion				
2.	Realis	tic Yield G	ioal					
2	Diant		Needed or All		r	N	P <sub>2</sub> 0 <sub>5</sub>	K <sub>2</sub> 0
3.	(based or NOTE: 1 sequence When ba	n soil tests (ST Plant Nutrient M e (e.g., com/wil sed on crop re	Needed OF And ) <u>or</u> crop removal ( Needs for " <u>N</u> " canno heat in a corn/whea moval, nutrients nee	CR) rates in Table 6) of exceed a one year crop t/soybean sequence) eded are based on yield level.				
4.	If app accord	dicable, ad ding to Thi Step 3 P₂O₅x	<b>ijusted P<sub>2</sub>O<sub>5</sub> A</b> reshold or P I 0	pplication Rate ndex.	1111		0	
								CETTICONCONTENTS, 8
5.	Nitro (Ibs/a	<b>gen Credit</b> c. from Tabl	s from previou le 4)	us legume crop	L	0		
6.	Fertil	izer Credit	<b>S</b> (Starter <u>or</u> Other	) (lbs/ac)		0	0	0
_								
7.	Nitrog (Ibs/a "N" in	c) Table 5 v n previous y	value x net appl vear(s)	manure applications lication of manure nutrients		0		241112111111111111111111
	Plant	Nutrients	Needed minu	s Credits (lbs/ac)		0	0	0
	(Step 3 fo	or N minus Step	os 5, 6, & 7 or Step	4 for P <sub>2</sub> O <sub>5</sub> minus Step 6)				
9.	Nutr (Use la	i <b>ents in Ma</b> b test <u>or</u> weigh	anure (Ibs/ton) ( hted value as determ	ircle: folids Liquids nined in Worksheet 1)		60.00	70.00	40.00
10	. Perc	ent Nutrie	nts Retained i	i <b>n System</b> (Table 2)		100%	100%	100%
_	Enter T	able value as a	decimal. (Enter zer	ro with lab analysis)	L	10070	10070	
11	(Step 9 )	Retained N Step 10) Entr	Nutrients in M er zero with lab ana	<b>anure (Ibs./ton)</b> lysis.		60	70	40
12	2. Perc	ent of ava	ilable nutrien	ts (Table 3)		0%	0%	0%
13	B. Net (Step 1	available r 1 x Step 12 wit	nutrients (Ibs. hout lab analysis. S	/ton) Step 9 x Step 12				
	with la	b analysis)						
14	4. APPI	ICATION	RATE (tons/ac)					
	(Step 8	/ Step 13)						
1	Note: /	Application limi Application	itations may apply.	See 590 Standard All Nutrients (Ibs/ac)				
	[Step :	13 x Step 14]					1	
1	5. Nutr	Tent Needs	8) "-" sign indicator	(lbs/ac)	L			
	(Step)	to minus step (	o, - sign nuicates					
	Ton	<b>s Availabl</b> Cake	e	-Tons Applied in Field (Step 14 x Field Acres)			=Balance	÷

ORKSHEET 2 - NUTRIENT BALANCE			
Tract Field No. Acres Soil Test P	Value (Mehlich 3	)	
Comp or Crop Sequence/Rotation			
. Realistic Yield Goal			
<ul> <li>Plant Nutrients Needed or Allowed (lbs/ac)</li> <li>(based on soil tests (ST) or crop removal (CR) rates in Table 6)</li> <li>NOTE: Plant Nutrient Needs for "<u>N</u>" cannot exceed a one year crop sequence (e.g., com/wheat in a com/wheat/soybean sequence)</li> <li>When based on crop removal, nutrients needed are based on yield level.</li> </ul>	N	P <sub>2</sub> 0 <sub>5</sub>	K <sub>2</sub> 0
<ul> <li>If applicable, adjusted P<sub>2</sub>O<sub>5</sub> Application Rate according to Threshold or P Index. Step 3 P<sub>2</sub>O<sub>5</sub> × 0</li> </ul>		0	
Nitrogen Credits from previous legume crop     (Ibs/ac. from Table 4)	0		
. Fertilizer Credits (Starter or Other) (Ibs/ac)	0	0	0
<ul> <li>Nitrogen credits for previous manure applications (lbs/ac) Table 5 value x net application of manure nutrients "N" in previous year(s)</li> </ul>	0		
Plant Nutrients Needed minus Credits (lbs/ac)	0	0	0
( $3$ for N minus Steps 5, 6, & 7 or Step 4 for P <sub>2</sub> O <sub>5</sub> minus Step 6)			
• Nutrients in Manure (lbs/ton) Circle: Solids Liquids (Use lab test <u>or</u> weighted value as determined in Worksheet 1)	55.00	55.00	45.00
<b>0. Percent Nutrients Retained in System</b> (Table 2) Enter Table value as a decimal. (Enter zero with lab analysis)	100%	100%	100%
<b>1. Net Retained Nutrients in Manure (lbs./ton)</b> (Step 9 x Step 10) Enter zero with lab analysis.	55	55	45
2. Percent of available nutrients (Table 3)	0%	0%	0%
.3. Net available nutrients (lbs./ton) (Step 11 x Step 12 without lab analysis. Step 9 x Step 12 with lab analysis)			·····
	<b></b>		
(Step 8 / Step 13)	L		
Note: Application limitations may apply. See 590 Standard <b>5. Net Application Amount for All Nutrients</b> (lbs/ac)			
[Step 13 x Step 14] <b>6. Nutrient Needs or Surpluses</b> (Ibs/ac) (Step 15 minus Step 8) "-" sign indicates need			
ons Available -Tons Applied in Field		=Balance	
Cleanout (Step 14 x Field Acres)			

# WOF HEET 3 - APPLICATION RATES AND LAND REQUIREMENTS 1

T	his section	to be	filled	out with	assistance	from	NRCS
	ffice						

							· · · ·	<	
Field	Acres	Crop Rotation / Sequence &	Application Date or	Application Rate <sup>2/</sup>	Form <sup>6/</sup>	Total per Field (tons or lbs)	Soil Test Phosphorus	P Index Rating <sup>4/</sup> (low	Planned BMPs <sup>5/</sup>
		Realistic Yield	Timing				3/	medium, high,	
								vory mgny	BMP
÷									
				•					· · ·
5		-		. T					
					-			· · · ·	

1/ Where land application is occurring under long term lease or agreement with adjacent landowner, fields must be included in the above table.

2/ Reference maximum rate per application in 590 Standard. For phosphorus based applications, a one time application can occur for crops grown in multiple years (e.g., corn following by winter wheat followed by soybeans).

3/ When soil test P exceeds 400, use Phosphorous Threshold or Phosphorous Index

4/ P Index Rating is used to indicate the potential movement for phosphorus. A "High" or "Very High" rating value indicates the need for BMPs to reduce P movement.

5/ Fields that have a "High" or "Very High" rating according to the current P Index will implement Best Management Practices to reduce the risk of nutrient movement to sensitive waterbodie BMPs may include, but not be limited to: installing vegetative buffers, reducing P2O5 application rate, incorporating manure, adding chemical treatments to litter that tie up soluble P and keep it from

over the landscape, and/or adjusting application timing.

Tract No.

6/ Nutrient Form: Enter S for solid, L for liquid, or C for commercial fertilizer.

KI	ENTUCKY P	HOSP	HORUS	s inde	X WOR	KSHEI	डा,		
Farm:		0				Date:	Decei	m <b>ber 17</b> , 2	2003
Tract:	· ·	0		·					
				FIELD F	EATURE (1,2,4, or	VALUE R 8 points)	ATINGS		
		Field #:		Acres:		Field #:	te A	Acres:	
Field Features	Weighted Factor (WF)	Existing Value	WF x Existing Value	Planned Value	WF x Planned Value	Existing Value	WF x Existing Value	Planned Value	WF x Planned Value
1. Hydrologic Soil Group	1.								
2. Residual Soil Test (P)	3								-
3. Field Slope Percent	1								
4. Land Cover Percent	3	12 2							
5. Vegetative Buffer Width	3							·	
6. Ag. Impaired Watershed	1						19 - C.		
7. Application Timing	3								
8 Application Method	3				×.				
S. Jistance To Waterbody	2								
10. MLRA Location	1								
FIELD FEATURES INDEX TOTALS		Existing Total*	0	Planned Total	0	Existing Total*	0	Planned Total	0

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Note: If existing total results in a "Low" or "Medium" rating, a nitrogen, or phosphorus based nutrient management plan may be implemented.

	Field Vulnerability for Phosphorus Loss
Total Points from P Index	Generalized Interpretation of P Index
>30	LOW potential for P movement from the field. Low probability of an adverse impact to waterbodies.
30 - 60	<b>MEDIUM</b> potential for P movement from the field. The chance of organic material and nutrients getting to waterbodies exists. Buffers, setbacks, lower manure rates, cover crops, crop residue practices alone or in combination may reduce impact.
61 - 112	<b>HIGH</b> potential for P movement from the field. The chance of organic material and nutrients getting to waterbodies is likely. Buffers, setbacks, lower manure rates, cover crops, crop residues, etc. in combination may reduce impact.
> 112	<b>VERY HIGH</b> potential for P movement from the field and an adverse impact on waterbodies.

Crop	Description	Residual N (lb/ac)
Alfalfa or Red Clover	Good Stand (> 4 tons/ac)	90
	Fair Stand (3 to 4 tons/ac)	70
	Poor Stand (< 3 tons/ac)	50
Hairy Vetch	Good	100
	Fair	75
	Poor	50
Soybeans		1/2 lb per bushel or 20 lbs/ac if not
		known

### Table 4 - Estimated Nitrogen Availability to Succeeding Crops from Legumes 1/

1/ Table 4 will be used to calculate the nitrogen credits (when legumes are grown prior to the present crop) in the nutrient budget. Nitrogen credits will be considered in estimating crop removal when it is used as a basis for planning nitrogen applications. When the nitrogen application is based on University of Kentucky Lime and Fertilizer Recommendations, estimated available nitrogen from previous crops will be considered in the recommendation.

### Table 5 - Estimates of Available Nitrogen from Manure Application in a Previous Year 1/2/

Frequency of Manure Applications	Manure Type (N availability coefficients**)				
	Poultry or Liquids	Other			
Less than 4 out of 10 years	0.03	0.05			
4-8 out of ten years	0.07	0.15			
More than 8 out of ten years	0.12	0.25			

1/ From D.B. Beegle, Penn State University. \*\*Percentage of total Nitrogen applied last year.

2/ Table 5 will be used to calculate the nitrogen credits (when manure is applied in years prior prior to the present crop) in the nutrient budget. Nitrogen credits will be considered in estimating crop removal when it is used as a basis for planning nitrogen applications. When the nitrogen application is based on University of Kentucky Lime and Fertilizer Recommendations, estimated available nitrogen from previous crops and manure/fertilizer applications will be considered in the recommendation.

### Table 6 - Crop Nutrient Removal Values\*

	Nutrients Removed (lbs/yield unit)						
Сгор	Yield Unit	Lbs per Yield Unit	Total Kjeldahl Nitrogen	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O		
Alfalfa hay <sup>1</sup> /	Ton	2000	50	14	55		
All other cool season grass/legume hay (except alfalfa) <sup>1/</sup>	Ton	2000	35	12	53		
Rye for grain <sup>2</sup>	Bushel	56	1.16	.33	.32		
Oats for grain <sup>2</sup>	Bushel	32	.62	.25	.19		
Barley for grain <sup>2</sup>	Bushel	48	0.90	0.41	0.30		
Corn for grain <sup>1</sup> /	Bushel	56	0.70	0.40	0.35		
Corn for silage or green chop $\frac{1}{2}$	Ton	2000	. 7.5	3.6	8.0		
Winter wheat for grain $\frac{1}{2}$	Bushel	60	1.20	0.50	0.30		
Sorghum for grain 1/	Bushel	56	0.95	0.41	0.30		
Soybean for beans $\frac{1}{2}$	Bushel	60	3.00	0.70	1.10		
Tobacco, burley <sup>1</sup> /	Pound	1	0.07	0.011	0.075		
Tobacco, dark air-cured $\frac{1}{2}$	Pound	1	0.07	0.006	0.06		
Tobacco, dark fire-cured <sup>1/</sup>	Pound	1	0.07	0.006	0.06		
Forage from pastureland <sup>34</sup>	Ton	2000					
Big Bluestern, Indiangrass, Little Bluestern, Switchgrass <sup>4/</sup> hay	Ton	2000	20	6.8	25		
Bermudagrass <sup>4</sup> hay	Ton	2000	37.6	8.7	33.6		
Reed Canary Grass 4 hay	Ton	2000	27	8.2	25		
Eastern Gamagrass hay	Ton	2000	35	16.1	31.2		

See Footnotes on Following Page

# Appendix B

### LITTER SAMPLING

All litter is not managed the same way. Nutrient content can vary considerably. Every poultry producer should have his or her litter analyzed for nutrient content. If the litter is fed to cattle, an analysis is critical. Litter is fed to cattle for crude protein and ash content. Litter with a crude protein content of 28 percent and an ash content less than 15 percent is ideal for feeding. Since calcium, phosphorus, potassium and trace minerals make up about 12 percent of the ash content, anything above that amount is probably soil. Since soil is worthless for feed, care must be taken when removing litter from the houses.

### Sample Collection

General Sampling. Several small samples should be collected in clean 5 gallon buckets. Mix the contents of the 5 gallon buckets for a composite sample. Place a one-gallon resealable freezer bag turned inside out over one hand. Grab a handful of manure with covered hand and turn the freezer bag right side out over the sample with the free hand. Seal the bag and place it in another freezer bag to prevent leaks. Label the bag and send to the lab or freeze it immediately to prevent nutrient losses. Label the bags with permanent marker as follows:

- 1. Name
- 2. Address
- 3. Type of chicken
- 4. Number of flocks representing the sample
- 5. House number
- 6. Method of sampling (in-house, from stack, during loading, in-field)

As a precautionary measure include the same information on a 3 by 5 card and place inside the outside freezer bag.

### **Other Methods of Sampling**

**In-House**: Ten to 15 samples are collected throughout the house before cleanout. Three to four samples should be collected under or near the waterers and the rest collected throughout the remainder of the house. Dig only as deeply as you plan to scrape. Be careful not to include any soil in the sample. This method of sampling will allow reports back before land application so that an appropriate land application amount can be determined. This method is labor intensive.

**During cleanout**. Samples are collected as litter is loaded onto the spreader or as it is temporarily stockpiled prior to spreading. Individual samples should be collected throughout the cleanout. This method of sampling will not allow time for lab results return before land application occurs. This method will reflect an analysis of what is actually scraped out of the houses.

**During spreading.** A plastic sheet or gallon plastic jugs cut in half are placed in the field to collect litter as it is spread. This method is most accurate. This method will not allow time for lab results to be returned in time. However, results can be used the following application event.

**Stockpile**. Litter stored for a period of time is subject to heat and this can change its chemical characteristics. Since temperatures will peak in 10 to 20 days after initial stacking, samples should be collected after the temperature drops and as close to spreading or feedings time as possible. Individual samples should be collected at several points as with the general sampling procedures. Make sure to dig into the stack 2 to 3 feet for representative sample.

#### Shipping

Samples should be shipped express mail to the lab the same day they are collected. If not, they should be refrigerated immediately. It is advisable to keep samples on ice even during shipment to the lab.