

Developing a Comprehensive Nutrient Management Plan

A Comprehensive Nutrient Management Plan (CNMP) is a planning tool for livestock operations that addresses production and natural resource goals by combining conservation practices and management to create a workable system to balance nutrient input and utilization. There are six essential parts to a CNMP:

- (1) manure & wastewater handling and storage
- (2) feed management
- (3) land treatment practices
- (4) nutrient management,
- (5) record keeping, and
- (6) other utilization options.

Inventory Needed

The first step in developing a comprehensive nutrient management plan is to “take stock”, or complete an inventory of the resources available to your operation. While specific numbers such as head of livestock or labor resources may fluctuate seasonally, gathering and comparing quantities can help direct you to workable solutions.

Please complete the following land, labor, livestock, and water inventories in this chapter. Extra sheets are available in the resources section of the manual. The information you provide in these inventories is for your use only unless you wish to share it with others to formalize your plan.

Current manure and soil test analysis results are needed to complete the inventory and provide you with your farm nutrient balance and manure nutrient quantities and values. If you do not have them at this time, please enter the quantities prior to attending the second session of this course.

What Is Needed for a CNMP?

1. **Site information**
 - names, phone numbers, and addresses of the owners and operators
 - location of farm site: address, how to get there and emergency 911 coordinates
 - farmstead sketch
 - emergency action plan covering fire, personal injury, manure storage and handling, and land application operations
 - description of how the farm uses management and structural practices to meet goals
 - information about any currently used manure management structures – age, days storage, and if changes are needed

2. **Production information**

- type of animals (examples: dairy cows, broilers), phases of production (hog farrow to finish, replacement dairy heifers), and how many days a year or cycle they are housed and thus depositing manure in a barn or building (versus out on pasture)
- animal count and average weight for each phase of production on this site
- estimated manure and wastewater volumes for this site

3. **Applicable permits**

- A note should be in the CNMP if the operation requires state or federal permits because of size or pollution history.
- If livestock mortality composting is used as the disposal method, it should be noted in the plan if the operator has completed OSU Extension Livestock Mortality Training course.

4. **Land application site information**

- date plan prepared
- written manure application agreements, if used
- aerial maps of land application area
- individual field maps with marked setbacks, buffers, waterways, and environmentally sensitive areas, such as sinkholes, wells, gullies, tile inlets, etc.
- landowner names, addresses, and phone numbers
- legal description of land sites, including watershed codes
- specific and unique field identification codes
- land use designation.
- soil map, with appropriate interpretations
- risk assessments for potential nitrogen or phosphorus transport from fields (this will be covered in chapter 7)
- a list of land treatment practices planned and used and how well they work

5. **Manure application plans**

- crop types, realistic yield targets, and expected crop nutrient needs
- application equipment descriptions and methods of application
- expected application seasons and estimated days of application per season
- estimated application amounts per acre (volume in gallons or tons per acre, and pounds of plant available nitrogen, phosphorous as P205, and potassium as K20 per acre)
- estimate of acres needed to apply manure generated on this site, respecting any guidelines published for nitrogen or phosphorous soil loading limits

6. Actual activity records

- soil tests less than 5 years old
- manure test annually for each individual manure storage unit
- records of manure and other fertilizers applied, when and how
- current and planned crop rotation
- actual crop and yield harvest from manure application sites
- record of internal inspections for manure system components
- record of any spill events

7. Mortality disposal

- plan for mortality disposal
- methods and equipment used to implement the disposal plan

8. Operation and Maintenance

- detailed operation and maintenance procedures for the conservation systems, holding facility, etc., contained in the CNMP, including procedures such as calibration of land application equipment, storage facility emptying schedule, soil and manure sampling techniques, etc.

You are strongly encouraged to finalize the CNMP plan with the assistance of a certified CNMP private planner, USDA-NRCS, or SWCD personnel.

General Farm Information

Date _____

Farm name: _____ Phone _____

Address: _____

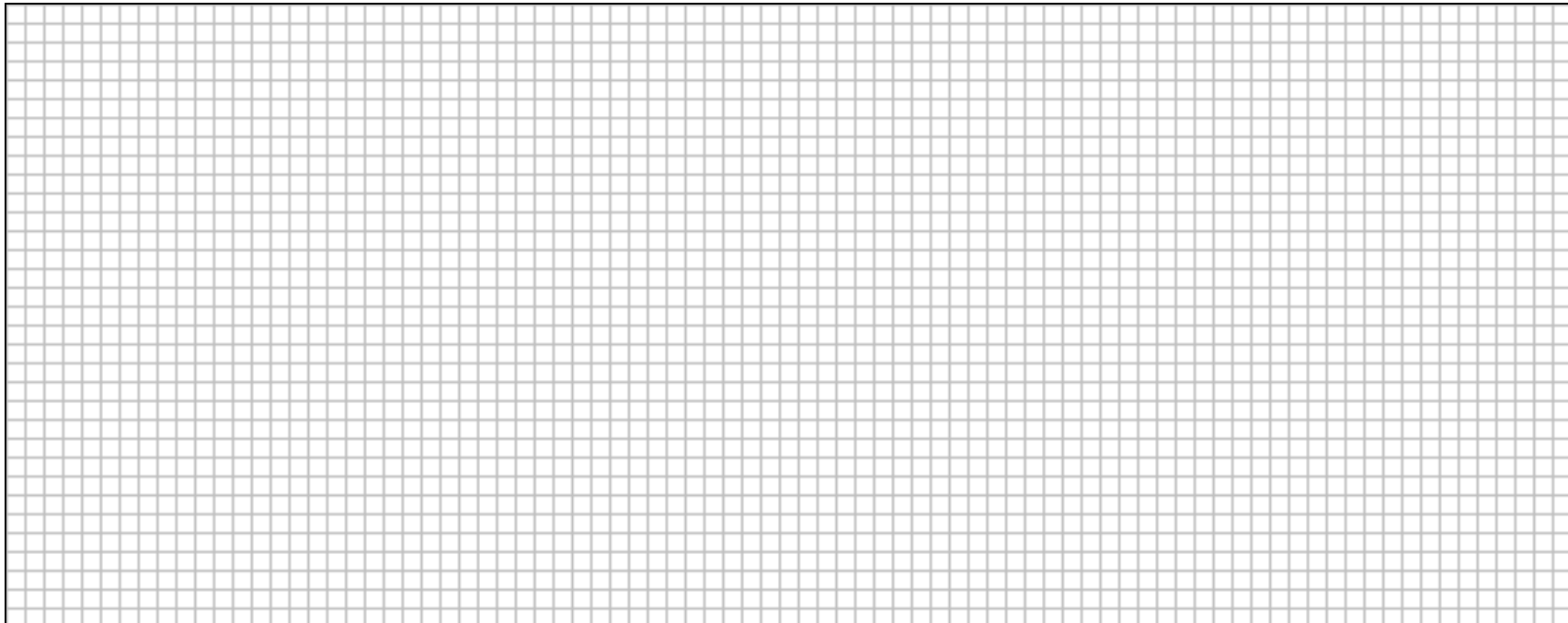
Decision maker(s): _____

Products: _____

Describe different locations or farm enterprises: _____

Farm Headquarters Sketch

Please sketch buildings, houses, property lines, roads (on and off farm) streams, ponds, wells, other water sources, manure storage and handling facilities (if present), feed storage, etc. for your reference. Please use aerial and soil maps for reference.



Livestock Inventory

A Barn or Facility Name	B Type of Livestock	C # Head	D Days/Year # Head Kept	E Ave. Wt.	F Number Days/Year Confined	G Number Days/Year Pastured	H Manure Storage/ Handling Facilities	I # Days Manure Stored Before Hauling	J Bedding Added- Estimate Cubic feet/year	K Washwater Used- Gallons /Year	L Open Lot Area- Estimate Square Ft.

A- Identity of barn, may include farm name if you maintain more than one location

B- Type of livestock you keep. Examples include:

- Pork – gestating sow, sow & litter, nursery pig, grower, finisher, boar
- Dairy – dry cow, milking cow, replacement heifer, calf, bull, dairy beef
- Beef – brood cow, cow & calf, weanling, replacement heifer, stocker, bull
- Sheep – ewe, ewe & lamb, weaned lamb, market lamb, ram
- Poultry – layers, pullet, broiler, turkey
- Horses – broodmare, weanling, yearling, horse, stallion

(This list is not meant to include all categories. Item B is simply a means for you to describe your units.)

C- Number of head you have at one time

D- Days per year this number of head are kept

E- Average weight per head or weight range

F- If livestock are confined in a lot or building, estimate the number of days per year

G- If livestock are pastured, estimate the number of days per year

H- List manure storage or handling facilities used for this unit

I- List the number of days storage capacity in the manure facility

J- Estimate the bedding added per year and note types (straw, sawdust)

K- Estimate the gallons of washwater (milkhouse, spraying)

L- Estimate square feet area of open animal holding lots

Land Inventory

Total acres managed _____ Total acres cropped _____

Names of different farms or production units that you manage

List crops that you raise (include forages)

Describe why you raise the crops you've selected

Determining realistic yield goals

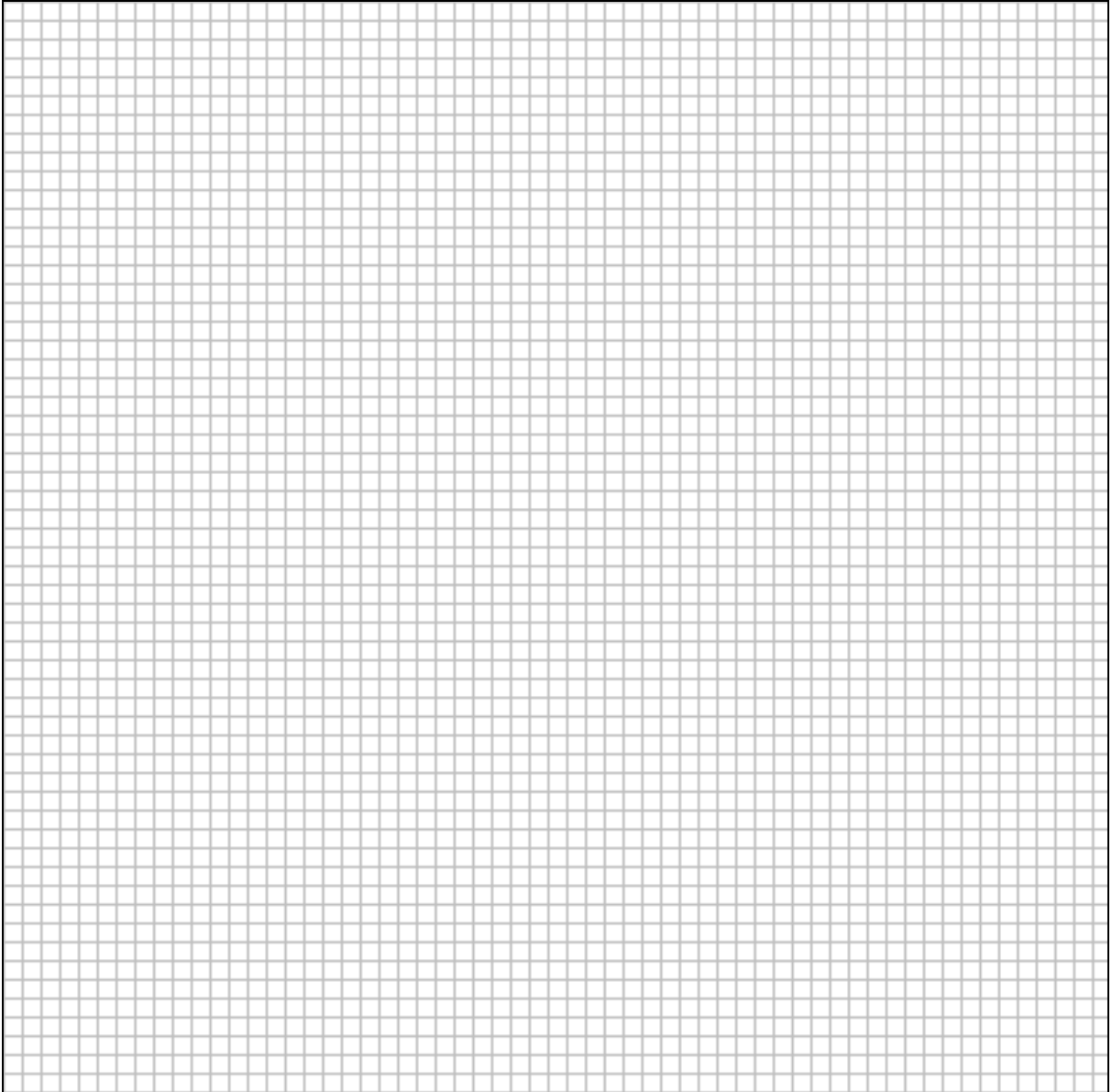
Accurate yield expectations can help you prevent the loss of profits in unneeded fertilizer bills. There are several ways to establish realistic yield goals. Annual harvest weight records are the most reliable and can help you avoid basing expectations on "off" years. When actual field harvest records are not available, you can base yield goals on fields that are similar in soil and cropping history. (E.g. What type of yields are your neighbors getting from similar fields?) How are your yield goals for fertilization plans developed?

Field Inventory

Crop Production Unit	Field Name or Number	Soil Type(s) in Field	Is the field tilled? (yes/no)	Is field erosion less than "T"? (yes/no)	Are field soil test analyses less than 3 years old?	Are soil phosphorus levels less than 300 lbs. Phosphorus/Acre or 150 ppm?	Previous crop & yield goal	Current crop & yield goal	Planned crop & yield goal	Planned Crop Rotation

Water Inventory

Water is a vital, yet, fragile resource for Ohio farms. Unfortunately, planning for all-weather water use and protecting water quality is often a challenge. If you are in the rural areas of Ohio, chances are very good that your family's water comes from a well. Annual well testing is an excellent way to check the quality of the water you drink. However, the best ways to ensure quality water for your farm is by identifying your water resources and plan their use and protection. Please sketch both your surface and ground water resources below.



Detailed local Fact Sheets on Ohio Water Resources (AEX 480.02 to AEX480.89) and Ohio Groundwater Resources (AEX 490.02 to AEX 490.89) are on Ohioline for most counties in Ohio. To view Fact Sheets on the internet go to <http://ohioline.osu.edu/lines/enr.html>.

On-Farm Water Risk Assessment

Now that you've identified the water resources you want to protect, let's review some common livestock operation threats to water supplies.

1. Do you keep livestock/poultry within 300 feet of your well, spring, or surface water sources such as creeks or streams?

- Yes No Doesn't Apply

2. Do you store manure within 300 feet of your well, spring, creek or stream?

- Yes No Doesn't Apply

3. Was the manure storage built without clay or impervious lining material to prevent the seepage of manure into groundwater? Does it spill or flush into surface water resources?

- Yes No Doesn't Apply

4. Does runoff from your livestock lot run within 300 feet of your well, spring or streams?

- Yes No Doesn't Apply

5. Do you dispose of dead animals on your farmstead within 300 feet your well?

- Yes No Doesn't Apply

6. Do you store silage within 300 feet of your well, and is it stored on a permeable (water can flow through it) soil?

- Yes No Doesn't Apply

List the primary on-farm threats to your water resources. These concerns may be from the categories listed above or other issues. (Again this information is for your use alone unless you would like to share it.)

How much water is needed?

Household _____
Milking Center or Processing Center _____
Flushwater _____

Livestock

Unit 1 Number of head _____
Maximum intake/head/day _____

Unit 2 Number of head _____
Maximum intake/head/day _____

Unit 3 Number of head _____
Maximum intake/head/day _____

Unit 4 Number of head _____
Maximum intake/head/day _____

Total Needed: _____

Water Sources:

Wells (gallons per minute) _____

Springs

Developed _____

Undeveloped _____

Rivers (accessible?) _____

Streams

Continuous _____

Intermittent or Seasonal _____

Ponds (size) _____

Cisterns _____

Municipal water plant _____

Getting It There -Water transfer:

Well pumps _____

Holding tanks _____

Determining Water Use

The best way to determine water use is to measure it through flow meters, to time cleaning operations and determining the rate of spray, or to count tanks of water used. The Ohio State University Fact Sheet AEX-420-94, "Water Use Planning Guide" by Karen Mancl is a good reference when water usage can't be measured. Following are water use estimates from the publication. For more information, go to <http://ohioline.osu.edu/aex-fact/index.html>.

The average person uses 50-75 gallons of water a day. Approximately 40% is used just to flush our toilets. The following table provides farm use estimates.

Animal/Use	Water Use (gal/animal/day)
Dairy cow	35
Dry cow or steer	12
Heifer	12
Hogs	4
Horse or pony	12
Sheep or goat	2
100 Chickens	5-10
100 Turkeys	10-18
Milking Center cleaning	4-10 per cow

Developing a Farm Business Plan

There are four primary components to a good business plan and they all build upon each other.

1. **Mission.** Why are you in business? Why does the farm business exist? Please take a moment to write down in a sentence or two your mission statement, include a description of the products/services your farm will market and their purpose.

2. **Objectives.** What will your farm look like in the future? Describe 3-5 objectives you would like to accomplish. (Objectives do not need deadlines, they are simply statements of what you want to do. Example: Create a farm web page to direct-market.)

3. **Goals.** SMART (Specific Measurable Attainable Relevant Trackable) steps to accomplish an objective. Select each of your objectives and map the steps needed to accomplish the objective. This may take some time, depending on how complex your objectives are.

Objective 1

Objective 2

Objective 3

“A farm run as a business is a good way of life; a farm run as a way of life is a poor business.”

– Don Rogers,
Farm Credit Service (From OSUE Management Excel Series)

4. **Tactics.** Who will do what, when will it be done, where and how will it occur? This step is where “the rubber meets the road”; decisions are put into action. It is tempting to avoid writing tactical plans because it takes time. But plans can crumble easily at this stage without commitment and communication. Writing plans ensures these items won’t be forgotten, clarifies responsibilities and deadlines, enables these items to be shared with family and employees, forces you to address forgotten areas (such as needed supplies), and most importantly, can help you monitor progress toward reaching the goal and evaluating the plan.

<i>Objective</i>	<i>Goal</i>	<i>What Will Be Done?</i>	<i>When?</i>	<i>By Whom?</i>

Resources

The Ohio State University Management Excel Training Program

United States Department of Agriculture, Natural Resources Conservation Service –
National Planning Procedures Handbook, Subpart F, Part 600.75 Draft Comprehensive
Nutrient Management Planning Technical Guidance, Subpart C – Exhibits,
Comprehensive Nutrient Management Plan – Format and Contents