

Nutrient Management Plan For Animal Waste Utilization
12-26-2016

This plan has been prepared for:

Carter & Sons
Clay Carter
648 Rivenbarktown Rd

Wallace, NC 28466
910-285-8720

This plan has been developed by:

Billy Houston
Duplin Soil & Water
165 Agruculture Dr
Suite B
Kenansville, NC 28349
910-296-2120 x3

Billy W Houston
Developer Signature

Type of Plan: Nitrogen Only with Manure Only

Owner/Manager/Producer Agreement

I (we) understand and agree to the specifications and the operation and maintenance procedures established in this nutrient management plan which includes an animal waste utilization plan for the farm named above. I have read and understand the Required Specifications concerning animal waste management that are included with this plan.

Clay Carter
Signature (owner)

12/26/16
Date

Signature (manager or producer)

Date

This plan meets the minimum standards and specifications of the U.S. Department of Agriculture - Natural Resources Conservation Service or the standard of practices adopted by the Soil and Water Conservation Commission.

Plan Approved By: Billy W Houston
Technical Specialist Signature

12/26/16
Date

Nutrients applied in accordance with this plan will be supplied from the following source(s):

Commercial Fertilizer is not included in this plan.

S7	Swine Feeder-Finish Lagoon Liquid waste generated 7,942,536 gals/year by a 8,568 animal Swine Finishing Lagoon Liquid operation. This production facility has waste storage capacities of approximately 180 days.				
Estimated Pounds of Plant Available Nitrogen Generated per Year					
Broadcast	14317				
Incorporated	17180				
Injected	17180				
Irrigated	14317				
	Max. Avail. PAN (lbs) *	Actual PAN Applied (lbs)	PAN Surplus/ Deficit (lbs)	Actual Volume Applied (Gallons)	Volume Surplus/ Deficit (Gallons)
Year 1	14,317	15734	-1,417	8,728,919	-786,383
Year 2	14,317	16004	-1,687	8,878,709	-936,173

Note: In source ID, S means standard source, U means user defined source.

* Max. Available PAN is calculated on the basis of the actual application method(s) identified in the plan for this source.

Narrative

WUP has been revised to reflect installation of a center pivot in field number 3 (removed pulls 7-10) see attached spec sheet and layout sketch.

Field	Area	Notes	Area	Notes	Area	Notes
1	1.00	1.00	2	2.00	2.00	2.00
3	3.00	3.00	4	4.00	4.00	4.00
5	5.00	5.00	6	6.00	6.00	6.00
7	7.00	7.00	8	8.00	8.00	8.00
9	9.00	9.00	10	10.00	10.00	10.00
11	11.00	11.00	12	12.00	12.00	12.00
13	13.00	13.00	14	14.00	14.00	14.00
15	15.00	15.00	16	16.00	16.00	16.00
17	17.00	17.00	18	18.00	18.00	18.00
19	19.00	19.00	20	20.00	20.00	20.00
21	21.00	21.00	22	22.00	22.00	22.00
23	23.00	23.00	24	24.00	24.00	24.00
25	25.00	25.00	26	26.00	26.00	26.00
27	27.00	27.00	28	28.00	28.00	28.00
29	29.00	29.00	30	30.00	30.00	30.00
31	31.00	31.00	32	32.00	32.00	32.00
33	33.00	33.00	34	34.00	34.00	34.00
35	35.00	35.00	36	36.00	36.00	36.00
37	37.00	37.00	38	38.00	38.00	38.00
39	39.00	39.00	40	40.00	40.00	40.00
41	41.00	41.00	42	42.00	42.00	42.00
43	43.00	43.00	44	44.00	44.00	44.00
45	45.00	45.00	46	46.00	46.00	46.00
47	47.00	47.00	48	48.00	48.00	48.00
49	49.00	49.00	50	50.00	50.00	50.00
51	51.00	51.00	52	52.00	52.00	52.00
53	53.00	53.00	54	54.00	54.00	54.00
55	55.00	55.00	56	56.00	56.00	56.00
57	57.00	57.00	58	58.00	58.00	58.00
59	59.00	59.00	60	60.00	60.00	60.00
61	61.00	61.00	62	62.00	62.00	62.00
63	63.00	63.00	64	64.00	64.00	64.00
65	65.00	65.00	66	66.00	66.00	66.00
67	67.00	67.00	68	68.00	68.00	68.00
69	69.00	69.00	70	70.00	70.00	70.00
71	71.00	71.00	72	72.00	72.00	72.00
73	73.00	73.00	74	74.00	74.00	74.00
75	75.00	75.00	76	76.00	76.00	76.00
77	77.00	77.00	78	78.00	78.00	78.00
79	79.00	79.00	80	80.00	80.00	80.00
81	81.00	81.00	82	82.00	82.00	82.00
83	83.00	83.00	84	84.00	84.00	84.00
85	85.00	85.00	86	86.00	86.00	86.00
87	87.00	87.00	88	88.00	88.00	88.00
89	89.00	89.00	90	90.00	90.00	90.00
91	91.00	91.00	92	92.00	92.00	92.00
93	93.00	93.00	94	94.00	94.00	94.00
95	95.00	95.00	96	96.00	96.00	96.00
97	97.00	97.00	98	98.00	98.00	98.00
99	99.00	99.00	100	100.00	100.00	100.00

Field	Area	Notes	Area	Notes	Area	Notes
1	1.00	1.00	2	2.00	2.00	2.00
3	3.00	3.00	4	4.00	4.00	4.00
5	5.00	5.00	6	6.00	6.00	6.00
7	7.00	7.00	8	8.00	8.00	8.00
9	9.00	9.00	10	10.00	10.00	10.00
11	11.00	11.00	12	12.00	12.00	12.00
13	13.00	13.00	14	14.00	14.00	14.00
15	15.00	15.00	16	16.00	16.00	16.00
17	17.00	17.00	18	18.00	18.00	18.00
19	19.00	19.00	20	20.00	20.00	20.00
21	21.00	21.00	22	22.00	22.00	22.00
23	23.00	23.00	24	24.00	24.00	24.00
25	25.00	25.00	26	26.00	26.00	26.00
27	27.00	27.00	28	28.00	28.00	28.00
29	29.00	29.00	30	30.00	30.00	30.00
31	31.00	31.00	32	32.00	32.00	32.00
33	33.00	33.00	34	34.00	34.00	34.00
35	35.00	35.00	36	36.00	36.00	36.00
37	37.00	37.00	38	38.00	38.00	38.00
39	39.00	39.00	40	40.00	40.00	40.00
41	41.00	41.00	42	42.00	42.00	42.00
43	43.00	43.00	44	44.00	44.00	44.00
45	45.00	45.00	46	46.00	46.00	46.00
47	47.00	47.00	48	48.00	48.00	48.00
49	49.00	49.00	50	50.00	50.00	50.00
51	51.00	51.00	52	52.00	52.00	52.00
53	53.00	53.00	54	54.00	54.00	54.00
55	55.00	55.00	56	56.00	56.00	56.00
57	57.00	57.00	58	58.00	58.00	58.00
59	59.00	59.00	60	60.00	60.00	60.00
61	61.00	61.00	62	62.00	62.00	62.00
63	63.00	63.00	64	64.00	64.00	64.00
65	65.00	65.00	66	66.00	66.00	66.00
67	67.00	67.00	68	68.00	68.00	68.00
69	69.00	69.00	70	70.00	70.00	70.00
71	71.00	71.00	72	72.00	72.00	72.00
73	73.00	73.00	74	74.00	74.00	74.00
75	75.00	75.00	76	76.00	76.00	76.00
77	77.00	77.00	78	78.00	78.00	78.00
79	79.00	79.00	80	80.00	80.00	80.00
81	81.00	81.00	82	82.00	82.00	82.00
83	83.00	83.00	84	84.00	84.00	84.00
85	85.00	85.00	86	86.00	86.00	86.00
87	87.00	87.00	88	88.00	88.00	88.00
89	89.00	89.00	90	90.00	90.00	90.00
91	91.00	91.00	92	92.00	92.00	92.00
93	93.00	93.00	94	94.00	94.00	94.00
95	95.00	95.00	96	96.00	96.00	96.00
97	97.00	97.00	98	98.00	98.00	98.00
99	99.00	99.00	100	100.00	100.00	100.00

The table shown below provides a summary of the crops or rotations included in this plan for each field. Realistic Yield estimates are also provided for each crop in the plan. In addition, the Leaching Index for each field is shown, where available.

Planned Crops Summary

Tract	Field	Total Acres	Useable Acres	Leaching Index (LI)	Soil Series	Crop Sequence	RYE
3972	1	11.14	11.14	N/A	Lumbec	Fescue Pasture	4.0 Tons
3972	2	10.31	10.31	N/A	Lumbec	Small Grain Overseed	1.0 Tons
						Hybrid Bermudagrass Pasture	4.5 Tons
3972	3	28.38	28.38	N/A	Noboco	Fescue Pasture	3.5 Tons
3972	4	18.69	18.69	N/A	Noboco	Small Grain Overseed	1.0 Tons
						Hybrid Bermudagrass Pasture	6.5 Tons
3972	5	9.66	9.66	N/A	Lumbec	Fescue Pasture	4.0 Tons
73389		15.00	15.00	N/A	Johns	Corn, Grain	120 bu.
						Wheat, Grain	55 bu.
						Soybeans, Manured, Double Crop	38 bu.

PLAN TOTALS: 93.18 93.18

LI	Potential Leaching	Technical Guidance
< 2	Low potential to contribute to soluble nutrient leaching below the root zone.	None
>= 2 & <= 10	Moderate potential to contribute to soluble nutrient leaching below the root zone.	Nutrient Management (590) should be planned.
> 10	High potential to contribute to soluble nutrient leaching below the root zone.	Nutrient Management (590) should be planned. Other conservation practices that improve the soils available water holding capacity and improve nutrient use efficiency should be considered. Examples are Cover Crops (340) to scavenge nutrients, Sod-Based Rotations (328), Long-Term No-Till (778), and edge-of-field practices such as Filter Strips (393) and Riparian Forest Buffers (391).

The Waste Utilization table shown below summarizes the waste utilization plan for this operation. This plan provides an estimate of the number of acres of cropland needed to use the nutrients being produced. The plan requires consideration of the realistic yields of the crops to be grown, their nutrient requirements, and proper timing of applications to maximize nutrient uptake.

This table provides an estimate of the amount of nitrogen required by the crop being grown and an estimate of the nitrogen amount being supplied by manure or other by-products, commercial fertilizer and residual from previous crops. An estimate of the quantity of solid and liquid waste that will be applied on each field in order to supply the indicated quantity of nitrogen from each source is also included. A balance of the total manure produced and the total manure applied is included in the table to ensure that the plan adequately provides for the utilization of the manure generated by the operation.

Waste Utilization Table

Year 1														
Tract	Field	Source ID	Soil Series	Total Acres	Use, Acres	Crop	RYE	Applic. Period	Nitrogen PA Nutrient Req'd (lbs/A)	Comm. Fert. Applied (lbs/A)	Res. (lbs/A)	Manure PA Nutrient Applied (lbs/A)	Liquid Manure Applied (acre)	Solid Manure Applied (acre)
									N	N	N	N	1000 gal/A	Tons
3972	1	S7	Lumbee	11.14	11.14	Fescue Pasture	4.0 Tons	8/1-7/31	130	0	0	130	72.12	0.00
3972	2	S7	Lumbee	10.31	10.31	Small Grain Overseed	1.0 Tons	10/1-3/31	50	0	0	50	27.74	0.00
3972	2	S7	Lumbee	10.31	10.31	Hybrid Bermudagrass Pasture	4.5 Tons	3/1-9/30	146	0	0	146	81.00	0.00
3972	3	S7	Noboco	28.38	28.38	Fescue Pasture	3.5 Tons	8/1-7/31	120	0	0	120	66.57	0.00
3972	4	S7	Noboco	18.69	18.69	Small Grain Overseed	1.0 Tons	10/1-3/31	50	0	0	50	27.74	0.00
3972	4	S7	Noboco	18.69	18.69	Hybrid Bermudagrass Pasture	6.5 Tons	3/1-9/30	222	0	0	222	123.16	0.00
3972	5	S7	Lumbee	9.66	9.66	Fescue Pasture	4.0 Tons	8/1-7/31	130	0	0	130	72.12	0.00
73389		S7	Johns	15.00	15.00	Corn, Grain	120 bu.	2/15-6/30	130	0	*15	115	63.80	0.00
73389		S7	Johns	15.00	15.00	Wheat, Grain	55 bu.	9/1-4/30	106	0	0	53	29.40	0.00
Total Applied, 1000 gallons													8,728.92	
Total Produced, 1000 gallons													7,942.54	
Balance, 1000 gallons													-786.38	
Total Applied, tons														0.00
Total Produced, tons														0.00
Balance, tons														0.00

Notes: 1. In the tract column, ~ symbol means leased, otherwise, owned. 2. Symbol * means user entered data.

Waste Utilization Table

Year 2

Tract	Field	Source ID	Soil Series	Total Acres	Use, Acres	Crop	RYE	Applic. Period	Nitrogen PA Nutrient Req'd (lbs/A)	Comm. Fert. Nutrient Applied (lbs/A)	Res. (lbs/A)	Manure PA Nutrient Applied (lbs/A)	Liquid Manure Applied (acre)	Solid Manure Applied (acre)	Liquid Manure Applied (Field)	Solid Manure Applied (Field)
3972	1	S7	Lumbee	11.14	11.14	Fescue Pasture	4.0 Tons	8/1-7/31	130	0	0	130	72.12	0.00	803.43	0.00
3972	2	S7	Lumbee	10.31	10.31	Small Grain Overseed	1.0 Tons	10/1-3/31	50	0	0	50	27.74	0.00	285.99	0.00
3972	2	S7	Lumbee	10.31	10.31	Hybrid Bermudagrass Pasture	4.5 Tons	3/1-9/30	146	0	0	146	81.00	0.00	835.09	0.00
3972	3	S7	Noboco	28.38	28.38	Fescue Pasture	3.5 Tons	8/1-7/31	120	0	0	120	66.57	0.00	1,889.36	0.00
3972	4	S7	Noboco	18.69	18.69	Small Grain Overseed	1.0 Tons	10/1-3/31	50	0	0	50	27.74	0.00	518.44	0.00
3972	4	S7	Noboco	18.69	18.69	Hybrid Bermudagrass Pasture	6.5 Tons	3/1-9/30	222	0	0	222	123.16	0.00	2,301.88	0.00
3972	5	S7	Lumbee	9.66	9.66	Fescue Pasture	4.0 Tons	8/1-7/31	130	0	0	130	72.12	0.00	696.69	0.00
73389		S7	Johns	15.00	15.00	Wheat, Grain	55 bu.	9/1-4/30	106	0	0	53	29.40	0.00	441.05	0.00
73389		S7	Johns	15.00	15.00	Soybeans, Manured, Double Crop	38 bu.	4/1-9/15	*133	0	0	133	73.79	0.00	1,106.78	0.00
Total Applied, 1000 gallons																
Total Produced, 1000 gallons																
Balance, 1000 gallons																
Total Applied, tons																
Total Produced, tons																
Balance, tons																

Notes: 1. In the tract column, ~ symbol means leased, otherwise, owned. 2. Symbol * means user entered data.

The Irrigation Application Factors for each field in this plan are shown in the following table. Infiltration rate varies with soils. If applying waste nutrients through an irrigation system, you must apply at a rate that will not result in runoff. This table provides the maximum application rate per hour that may be applied to each field selected to receive wastewater. It also lists the maximum application amount that each field may receive in any one application event.

Irrigation Application Factors

Tract	Field	Soil Series	Application Rate (inches/hour)	Application Amount (inches)
3972	1	Lumbee	0.40	1.0
3972	2	Lumbee	0.40	1.0
3972	3	Noboco	0.50	1.0
3972	4	Noboco	0.50	1.0
3972	5	Lumbee	0.40	1.0
73389		Johns	0.50	1.0

The following Lagoon Sludge Nitrogen Utilization table provides an estimate of the number of acres needed for sludge utilization for the indicated accumulation period. These estimates are based on average nitrogen concentrations for each source, the number of animals in the facility and the plant available nitrogen application rates shown in the second column.

Lagoon sludge contains nutrients and organic matter remaining after treatment and application of the effluent. At clean out, this material must be utilized for crop production and applied at agronomic rates. In most cases, the priority nutrient is nitrogen but other nutrients including phosphorous, copper and zinc can also be limiting. Since nutrient levels are generally very high, application of sludge must be carefully applied.

Sites must first be evaluated for their suitability for sludge application. Ideally, effluent spray fields should not be used for sludge application. If this is not possible, care should be taken not to load effluent application fields with high amounts of copper and zinc so that additional effluent cannot be applied. On sites vulnerable to surface water moving to streams and lakes, phosphorous is a concern. Soils containing very high phosphorous levels may also be a concern.

Lagoon Sludge Nitrogen Utilization Table

Crop	Maximum PA-N Rate lb/ac	Maximum Sludge Application Rate 1000 gal/ac	Minimum Acres 5 Years Accumulation	Minimum Acres 10 Years Accumulation	Minimum Acres 15 Years Accumulation
Swine Feeder-Finish Lagoon Sludge - Standard					
Corn 120 bu	150	14.69	96.25	192.49	288.74
6 ton R.Y.E.	300	29.38	48.12	96.25	144.37
Soybean 40 bu	160	15.67	90.23	180.46	270.69

The Available Waste Storage Capacity table provides an estimate of the number of days of storage capacity available at the end of each month of the plan. Available storage capacity is calculated as the design storage capacity in days minus the number of days of net storage volume accumulated. The start date is a value entered by the user and is defined as the date prior to applying nutrients to the first crop in the plan at which storage volume in the lagoon or holding pond is equal to zero.

Available storage capacity should be greater than or equal to zero and less than or equal to the design storage capacity of the facility. If the available storage capacity is greater than the design storage capacity, this indicates that the plan calls for the application of nutrients that have not yet accumulated. If available storage capacity is negative, the estimated volume of accumulated waste exceeds the design storage volume of the structure. Either of these situations indicates that the planned application interval in the waste utilization plan is inconsistent with the structure's temporary storage capacity.

Available Waste Storage Capacity

Source Name	Swine Feeder-Finish Lagoon Liquid		Design Storage Capacity (Days)
Start Date	9/1		180
Plan Year	Month	Available Storage Capacity (Days) *	
1	1	115	
1	2	117	
1	3	137	
1	4	152	
1	5	166	
1	6	180	
1	7	180	
1	8	180	
1	9	180	
1	10	177	
1	11	173	
1	12	152	
2	1	131	
2	2	129	
2	3	146	
2	4	168	
2	5	180	
2	6	180	
2	7	180	
2	8	180	
2	9	180	
2	10	171	
2	11	162	
2	12	137	

* Available Storage Capacity is calculated as of the end of each month.

Required Specifications For Animal Waste Management

- 1. Animal waste shall not reach surface waters of the state by runoff, drift, manmade conveyances, direct application, or direct discharge during operation or land application. Any discharge of waste that reaches surface water is prohibited.**
- 2. There must be documentation in the design folder that the producer either owns or has an agreement for use of adequate land on which to properly apply the waste. If the producer does not own adequate land to properly dispose of the waste, he/she shall provide evidence of an agreement with a landowner, who is within a reasonable proximity, allowing him/her the use of the land for waste application. It is the responsibility of the owner of the waste production facility to secure an update of the Nutrient Management Plan when there is a change in the operation, increase in the number of animals, method of application, receiving crop type, or available land.**
- 3. Animal waste shall be applied to meet, but not exceed, the nitrogen needs for realistic crop yields based upon soil type, available moisture, historical data, climatic conditions, and level of management, unless there are regulations that restrict the rate of applications for other nutrients.**
- 4. Animal waste shall be applied to land eroding less than 5 tons per acre per year. Waste may be applied to land eroding at more than 5 tons per acre per year but less than 10 tons per acre per year provided grass filter strips are installed where runoff leaves the field (see USDA, NRCS Field Office Technical Guide Standard 393 - Filter Strips).**
- 5. Odors can be reduced by injecting the waste or by disking after waste application. Waste should not be applied when there is danger of drift from the land application field.**
- 6. When animal waste is to be applied on acres subject to flooding, waste will be soil incorporated on conventionally tilled cropland. When waste is applied to conservation tilled crops or grassland, the waste may be broadcast provided the application does not occur during a season prone to flooding (see "Weather and Climate in North Carolina" for guidance).**

7. Liquid waste shall be applied at rates not to exceed the soil infiltration rate such that runoff does not occur offsite or to surface waters and in a method which does not cause drift from the site during application. No ponding should occur in order to control odor and flies.
8. Animal waste shall not be applied to saturated soils, during rainfall events, or when the soil surface is frozen.
9. Animal waste shall be applied on actively growing crops in such a manner that the crop is not covered with waste to a depth that would inhibit growth. The potential for salt damage from animal waste should also be considered.
10. Nutrients from waste shall not be applied in fall or winter for spring planted crops on soils with a high potential for leaching. Waste/nutrient loading rates on these soils should be held to a minimum and a suitable winter cover crop planted to take up released nutrients. Waste shall not be applied more than 30 days prior to planting of the crop or forages breaking dormancy.
11. Any new swine facility sited on or after October 1, 1995 shall comply with the following: The outer perimeter of the land area onto which waste is applied from a lagoon that is a component of a swine farm shall be at least 50 feet from any residential property boundary and canal. Animal waste, other than swine waste from facilities sited on or after October 1, 1995, shall not be applied closer than 25 feet to perennial waters.
12. Animal waste shall not be applied closer than 100 feet to wells.
13. Animal waste shall not be applied closer than 200 feet of dwellings other than those owned by the landowner.
14. Waste shall be applied in a manner not to reach other property and public right-of-ways.
15. Highly visible markers shall be installed to mark the top and bottom elevations of the temporary storage (pumping volume) of all waste treatment lagoons. Pumping shall be managed to maintain the liquid level between the markers. A marker will be required to mark the maximum storage volume for waste storage ponds.

15. Animal waste shall not be discharged into surface waters, drainageways, or wetlands by a discharge or by over-spraying. Animal waste may be applied to prior converted cropland provided the fields have been approved as a land application site by a "technical specialist". Animal waste shall not be applied on grassed waterways that discharge directly into water courses, and on other grassed waterways, waste shall be applied at agronomic rates in a manner that causes no runoff or drift from the site.
16. Domestic and industrial waste from washdown facilities, showers, toilets, sinks, etc., shall not be discharged into the animal waste management system.
17. A protective cover of appropriate vegetation will be established on all disturbed areas (lagoon embankments, berms, pipe runs, etc.). Areas shall be fenced, as necessary, to protect the vegetation. Vegetation such as trees, shrubs, and other woody species, etc., are limited to areas where considered appropriate. Lagoon areas should be kept mowed and accessible. Berms and structures should be inspected regularly for evidence of erosion, leakage, or discharge.
18. If animal production at the facility is to be suspended or terminated, the owner is responsible for obtaining and implementing a "closure plan" which will eliminate the possibility of an illegal discharge, pollution, and erosion.
19. Waste handling structures, piping, pumps, reels, etc., should be inspected on a regular basis to prevent breakdowns, leaks, and spills. A regular maintenance checklist should be kept on site.
20. Animal waste can be used in a rotation that includes vegetables and other crops for direct human consumption. However, if animal waste is used on crops for direct human consumption, it should only be applied pre-plant with no further applications of animal waste during the crop season.
21. Highly visible markers shall be installed to mark the top and bottom elevations of the temporary storage (pumping volume) of all waste treatment lagoons. Pumping shall be managed to maintain the liquid level between the markers. A marker will be required to mark the maximum storage volume for waste storage ponds.

22. Waste shall be tested within 60 days of utilization and soil shall be tested at least annually at crop sites where waste products are applied. Nitrogen shall be the rate-determining nutrient, unless other restrictions require waste to be applied based on other nutrients, resulting in a lower application rate than a nitrogen based rate. Zinc and copper levels in the soils shall be monitored and alternative crop sites shall be used when these metals approach excessive levels. pH shall be adjusted and maintained for optimum crop production. Soil and waste analysis records shall be kept for a minimum of five years. Poultry dry waste application records shall be maintained for a minimum of three years. Waste application records for all other waste shall be maintained for five (5) years.
23. Dead animals will be disposed of in a manner that meets North Carolina regulations.

Crop Notes

The following crop note applies to field(s):

Corn 1: CP, Mineral Soil, low-leachable

In the Coastal Plain, corn is normally planted when soil temperatures reach 52 to 55 degrees fahrenheit. Review the Official Variety "green book" and information from private companies to select a high yielding variety with the characteristics needed for your area and conditions. Plant 1-2" deep. Plant populations should be determined by the hybrid being planted. Increase the seeding rate by 10% when planting no-till. Phosphorus and potassium recommended by a soil test can be broadcast or banded at planting. When planting early in cool, wet soil, banded phosphorus will be more available to the young plants. An accepted practice is to apply 20-30 lbs/acre N and 20-30 lbs/acre phosphorus banded as a starter and one-half the remaining N behind the planter. The rest of the N should be applied about 30-40 days after emergence. The total amount of N is dependent on soil type. When including a starter in the fertilizer program, the recommended potassium and any additional phosphorus is normally broadcast at planting. Plant samples can be analyzed during the growing season to monitor the overall nutrient status of the corn. Timely management of weeds and insects are essential for corn production.

The following crop note applies to field(s): 1, 5

Fescue: Coastal Plain, Mineral Soil, Poorly Drained to Somewhat Poorly Drained.

Adaptation: Moderate to Marginal.

In the Coastal Plain, tall fescue can be planted Sept. 1 to Oct. 15 (best) and Feb. 15 to Mar. 20. For pure-stand broadcast seedings use 20 to 30 lb/ac., for drilled use 15 to 20 lb/ac. seed. Use certified seed to avoid introducing weeds or annual ryegrass. Plant seed 0.25" to 0.5" deep for pure stands, 0.25" in mixture with clovers. Tall fescue will tolerate soil wetness but not flooding or prolonged saturation; use ladino clover for mixtures on these soils. Soil test for preplant and maintenance lime, phosphorus, and potassium recommendations. Apply 40 to 60 lb/ac nitrogen at planting for pure stands only. Do not apply N for mixtures with clovers but use proper legume inoculation techniques. Apply 150 to 200 lb/ac. N to pure-stand fescue for hay production; reduce N rates by 25% for grazing. Apply N Feb. 1 to Mar. 20 and Aug. 20 to Sept. 30, with equal amounts in each window. Refer to NCSU Technical Bulletin 305 Production and Utilization of Pastures and Forages in North Carolina for additional information or consult your regional agronomist or extension agent for assistance.

The following crop note applies to field(s): 3

Fescue: Coastal Plain, Mineral Soil, Moderately Well Drained

Adaptation: Marginal.

In the Coastal Plain, tall fescue can be planted Sept. 1 to Oct. 15 (best) and Feb. 15 to Mar. 20. For pure-stand broadcast seedings use 20 to 30 lb/ac., for drilled use 15 to 20 lb/ac. seed. Use certified seed to avoid introducing weeds or annual ryegrass. Plant seed 0.25" to 0.5" deep for pure stands, 0.25" in mixture with clovers. Tall fescue requires adequate soil moisture for persistence and production. Soil test for preplant and maintenance lime, phosphorus, and potassium recommendations. Apply 40 to 60 lb/ac nitrogen at planting for pure stands only. Do not apply N for mixtures with clovers but use proper legume inoculation techniques. Apply 150 to 200 lb/ac. N to pure-stand fescue for hay production; reduce N rates by 25% for grazing. Apply N Feb. 1 to Mar. 20 and Aug. 20 to Sept. 30, with equal amounts in each window. Refer to NCSU Technical Bulletin 305 Production and Utilization of Pastures and Forages in North Carolina for additional information or consult your regional agronomist or extension agent for assistance.

The following crop note applies to field(s): 2

Small Grain: CP, Mineral Soil, low-leachable

In the Coastal Plain, oats and barley should be planted from October 15-October 30; and rye from October 15-November 20. For barley, plant 22 seed/drill row foot and increase the seeding rate by 5% for each week seeding is delayed beyond the optimum time. See the seeding rates table for applicable seeding rate modifications in the current NCSU "Small Grain Production Guide". Also, increase the initial seeding rate by at least 10% when planting no-till. Oats should be planted at 2 bushels/acre and rye at 1-1 1/2 bushels/acre. Plant all these small grains at 1-1 1/2" deep. Adequate depth control is essential. Review the NCSU Official Variety "green book" and information from private companies to select a high yielding variety with the characteristics needed for your area and conditions. Apply no more than 30 lbs/acre N at planting. Phosphorus and potash recommended by a soil test can also be applied at this time. The remaining N should be applied during the months of February-March.

The following crop note applies to field(s): 4

Small Grain: CP, Mineral Soil, medium leachable

In the Coastal Plain, oats and barley should be planted from October 15-October 30; and rye from October 15-November 20. For barley, plant 22 seed/drill row foot and increase the seeding rate by 5% for each week seeding is delayed beyond the optimum time. See the seeding rates table for applicable seeding rate modifications in the current NCSU "Small Grain Production Guide". Also, increase the initial seeding rate by at least 10% when planting no-till. Oats should be planted at 2 bushels/acre and rye at 1-1 1/2 bushels/acre. Plant all these small grains at 1-1 1/2" deep. Adequate depth control is essential. Review the NCSU Official Variety "green book" and information from private companies to select a high yielding variety with the characteristics needed for your area and conditions. Apply no more than 30 lbs/acre N at planting. Phosphorus and potash recommended by a soil test can also be applied at this time. The remaining N should be applied during the months of February-March.

The following crop note applies to field(s): 2

Bermudagrass CP, Mineral Soil, Poorly Drained to Somewhat Poorly Drained.

Adaptation: Effective artificial drainage MUST be in place to achieve Realistic Yield Expectations provided for these soils.

In the Coastal Plain, hybrid bermudagrass sprigs can be planted Mar. 1 to Mar. 31. Cover sprigs 1" to 3" deep (1.5" optimal). Sprigs should be planted quickly after digging and not allowed to dry in sun and wind. For Coastal and Tifton 78 plant at least 10 bu/ac in 3' rows, spaced 2' to 3' in the row. Generally a rate of 30 bu/ac is satisfactory to produce full groundcover in one or two years under good growing conditions. Tifton 44 spreads slowly, so use at least 40 bu/ac in 1.5' to 2' rows spaced 1' to 1.5' in row. For broadcast/disked-in sprigs use about 60 bu/ac. Soil test for the amounts of lime, phosphorus, potassium and micronutrients to apply preplant and for annual maintenance. Apply 60 to 100 lb/ac N in the establishment year in split applications in April and July. For established stands apply 180 to 240 lb/ac N annually in split applications, usually in April and following the first and second hay cuts. Reduce N rates by 25% for grazing. Refer to NCSU Technical Bulletin 305 Production and Utilization of Pastures and Forages in North Carolina for more information or consult your regional agronomist or extension agent for assistance.

The following crop note applies to field(s): 4

Bermudagrass: CP, Mineral Soil, Moderately Well Drained.

Adaptation: Well-adapted.

In the Coastal Plain, hybrid bermudagrass sprigs can be planted Mar. 1 to Mar. 31. Cover sprigs 1" to 3" deep (1.5" optimal). Sprigs should be planted quickly after digging and not allowed to dry in sun and wind. For Coastal and Tifton 78 plant at least 10 bu/ac in 3' rows, spaced 2' to 3' in the row. Generally a rate of 30 bu/ac is satisfactory to produce full groundcover in one or two years under good growing conditions. Tifton 44 spreads slowly, so use at least 40 bu/ac in 1.5' to 2' rows spaced 1' to 1.5' in row. For broadcast/disked-in sprigs use about 60 bu/ac. Soil test for the amounts of lime, phosphorus, potassium and micronutrients to apply preplant and for annual maintenance. Apply 60 to 100 lb/ac N in the establishment year in split applications in April and July. For established stands apply 180 to 240 lb/ac N annually in split applications, usually in April and following the first and second hay cuts. Reduce N rates by 25% for grazing. Refer to NCSU Technical Bulletin 305 Production and Utilization of Pastures and Forages in North Carolina for more information or consult your regional agronomist or extension agent for assistance.

The following crop note applies to field(s):

Wheat: Coastal Plain, Mineral Soil, low-leachable

In the Coastal Plain, wheat should be planted from October 20-November 25. Plant 22 seed/drill row foot at 1-1 1/2" deep and increase the seeding rate by 5% for each week seeding is delayed beyond the optimum time. See the seeding rates table for applicable seeding rate modifications in the current NCSU "Small Grain Production Guide". Also, increase the initial seeding rate by at least 10% when planting no-till. Adequate depth control when planting the wheat is essential. Review the NCSU Official Variety "green book" and information from private companies to select a high yielding variety with the characteristics needed for your area and conditions. Apply no more than 30 lbs/acre N at planting. Phosphorus and potash recommended by a soil test can also be applied at this time. The remaining N should be applied during the months of February-March. The total N is dependent on the soil type. Plant samples can be analyzed during the growing season to monitor the nutrient status of the wheat. Timely management of diseases, insects and weeds are essential for profitable wheat production.

The following crop note applies to field(s):

Double-Crop Soybeans, Coastal Plain: Mineral Soil, low-leachable

Double-crop soybeans should be planted as early in June as possible with planting completed by July 4th. When no-tilling soybeans in small grain straw, it is essential to manage the straw to achieve adequate plant populations. Review the NCSU Official Variety "green book" and information from private companies to select a high yielding variety with the characteristics needed for your area and conditions. Plant 2-4 seed/row foot for 7-8" drills; 4-6 seed/row foot for 15" rows; 6-8 seed/row foot for 30" rows and 8-10 seed/row foot for 36" rows. Increase the seeding rate by at least 10% for no-till planting. Seeding depth should be 1-1 1/2" and adequate depth control is essential. Phosphorus and potash recommended for the soybeans can be applied to the wheat in the Fall. Soybeans produce their own nitrogen and are normally grown without additions of nitrogen. However, applications of 20-30 lbs/acre N are sometimes made at planting to promote early growth and vigor. Tissue samples can be analyzed during the growing season to monitor the overall nutrient status of the soybeans. Timely management of weeds and insects is essential for profitable double crop soybean production.