NC Interagency Nutrient Management Committee **October 24, 2013**

Attendees: David Crouse, Carl Crosier, Keith Larick, Josh Spencer, Jot Smyth, Joseph Hudyncia, Colleen Hudak-Wise, Natalie Woolard, Deanna Osmond

NCANAT Issue

D. Crouse has experienced that the current NCANAT software doesn't work with Office 2013.

Nutrient Management Software

Discussions continued regarding the best way to consolidate the NM Software and NCANAT so that updates would only consist of one set of tables. It was suggested that the software needs to be working at the soil mapping unit level,

The following issues were noted when attempting to combine the two program tables:

> Crops in NCANAT/NM are referenced differently (cropID is different). One solution is has crop listed twice with two separate IDs.
>
> Irrigation Tables – Check with BAE regarding using just 1217 guidance on irrigation rates – there are some plans that exceed 1217 guidance. Options would be to set all values for irrigation table as .5 or 1 or eliminate the table.

J. Spencer will check with NRCS IT to see how to address the federal administrative issues. It may be useful to take an inventory of district employees who are using county computers/workstation. N Woolard will ask if this information is already available.

D. Osmond stated there is approximately $12,000 remaining for software development. The deadline of those funds will be August 31, 2014. If the Department cannot get the entire project completed by then specify the deliverables they can complete for contract development.

D. Crouse will receive all of the final tables to ensure the format matches his master soil table. NRCS is now only publishing public data sets annually.

J. Spencer pointed out the need to create a simplified version of the rate tables for the reports. A review of the specifications will also need to be completed. These items should be able to be updated by DSWC/NCSU staff and fixed outside the programming contract if needed. The priority is to be able to get a final functioning product.

It was requested that a demonstration of the Goggle Enterprise Client software that NCDA is using for planning purposes be on the next meeting agenda.

Corn RYE Data

D. Osmond reviewed the process in which the current RYE data tables were established. The yields are 20+ years old and based on observations across the state. It was more subjective than data driven.

J. Smyth presented data of the corn research plots in each region. Many other experiments throughout the state did not show an N response and were not included in determining the optimum yield. For comparative purposes the data sets were also adjusted for previous crop legume credits.

Based on new hybrids, increasing N rate is not what is causing an increase in yield. Data show that adjusting the tillage process tends to produce the higher yields rather than increasing the N rate. There is a significant difference of yield in the mountains. The temperature is the factor that makes the mountain region so different than coastal plan. Typically, the corn planted in the mountain region does not have the drought stress in the flood plain as you see in the coastal plain.

Generally speaking, committee members reported observing similar increasing in yield for corn. D. Osmond reported a observations of a survey of 90 Piedmont farmers who were utilizing long term conservation tillage. She also stated that Ron Gehl has seen similar yield increases. Keith Larick supported that idea with conversation with Melissa Rosebrock regarding yields from Piedmont dairies.

D. Osmond stated that the N factors of less than one are not specifically unique to North Carolina; similar trends are being seen across the US. Current N factors are set at the soil management group level. Steve Hodges set 1.0 as clay textural class and 1.25 as sandy textual class. He then used linear equation to establish specific N factors for each soil management group.

The small number of trials and data set were discussed, however it is actual data that could support any changes verses a more subjective process. For the Piedmont and Coastal Plain, the data supports the general trend from industry of 1% increase in yield per year. It is suggested that the initial yields were established too low originally.

Potential Options:

- Change soil series table to add n factor for each crop. Calculate for corn based INMC RYE decision. All other crops keep same factor as in the SMU table until additional research can be completed and reviewed.
- Option 1 – Make no change in yield
- Option 2 – Changes made on regional basis
    - Coastal Plain – Increase Yield 15%; Decrease N Factor 15%
    - Piedmont – Increase Yield 18%; Decrease N Factor 18%
    - Mountain – Increase Yield 31%; Decrease N Factor 31%
- Option 3 – Combine Coastal Plain and Piedmont
    - Coastal Plain – Increase Yield 15%; Decrease N Factor 15%
    - Piedmont – Increase Yield 15%; Decrease N Factor 15%

    - Mountain – Increase Yield 31%; Decrease N Factor 31%

- Option 4 – Make statewide adjustment
    - Increase Yield 17%; Decrease N Factor 17%

D. Osmond will provide a more detailed report specifically explaining the rationale for these recommended changes. D. Crouse will provide a spreadsheet of the RYE and N factor per soil type in each region for discussion at next meeting.

Next meeting

November 14th – Natalie will send out notice.

For 2014 regular meeting dates – suggested that we meet the 2nd Thursday of odd months from 1-3.

January 9th, 2014
March 13th, 2014
May 8th, 2014
July 10th, 2014
September 11th, 2014
November 13th, 2014

Soil Management Group (SMG) descriptions and mean linear-plateau N response parameters.

SMG	Description	Trials	Y Intercept	Slope
			bu/ac	bu/lb N
	Coastal Plain			
2	16-51” organic layer over sands, vpd[#]	3	94	0.46
3	16-51” organic layer over silts, loams, vpd	1	117	0.63
6	Min-org histic or umbric, fine or silty, vpd	8	76	0.38
7	Min.-org. histic or umbric, loamy, vpd	13	84	0.48
10	Mineral, silty, pd	4	81	0.48
11	Mineral, fine, pd	1	52	0.78
12	Mineral, fine loamy & coarse loamy, pd	3	91	0.51
20	Mineral, fine loamy & coarse loamy, mwd	1	84	0.69
25	Mineral, fine loamy & coarse loamy, wd	2	85	0.28
27	Arenic, 20-40” to Bt, loamy, wd to ewd	1	50	0.39
	Piedmont			
109	Rhodic, fine, wd	1	25	1.14
111	Felsic, fine, wd	1	65	0.28
113	Slate belt, fine, wd	2	82	0.38
	Mountain			
205	Flood plains, loamy, swpd to wd	3	230	0.48
206	Terrace-toe slope, fine loamy, mwd to wd	1	126	0.64
215	Terrace, argillic horizon, fine loamy, wd	1	119	0.40

[#] Drainage class: vpd- very poorly drained; pd – poorly drained; mwd – moderately well drained; wd – well drained; ewd – excessively well drained; swpd – somewhat poorly drained.

Comparisons of mean optimum yields, optimum N rates and N factors between the standard (Std.) RYE database and measured (Mea.) field experiment values for Soil Management Groups.

		Optimum Yield			Optimum N Rate			N Factor		
SMG	**N**	**Std.**	**Mea.**	**SD[1]**	**Std.[2]**	**Mea.**	**SD**	**Std.**	**Mea.[3]**	**SD**
			bu/ac			lb/ac			lb N/bu	
Coastal Plain										
2	3	130	161	29	116	120	22	1.06	0.89	0.10
3	1	150	181	--	137	81	--	1.06	0.57	--
6	8	146	150	21	139	164	47	1.06	1.21	0.28
7	13	135	162	32	135	138	36	1.11	0.97	0.28
10	4	138	167	36	124	143	39	1.06	0.99	0.12
11	1	120	183	--	130	134	--	1.08	0.73	--
12	3	130	149	57	118	96	26	1.08	0.91	0.53
20	1	130	149	--	126	75	--	1.14	0.65	--
25	2	115	128	72	105	134	48	1.14	1.34	0.34
27	1	75	114	--	70	130	--	1.22	1.33	--
Mean	*37*	*134*	*157**	*33*	*128*	*136*	*40*	*1.09*	*1.02*	*0.31*
Piedmont										
109	1	132	201	--	125	123	--	1.11	0.72	--
111	1	119	111	--	132	130	--	1.11	1.17	--
113	2	114	136	6	101	126	57	1.08	1.08	0.37
Mean	*4*	*120*	*146*	*39*	*115*	*126*	*33*	*1.10*	*1.01*	*0.29*
Mountain										
205	3	155	272	11	142	86	40	1.06	0.40	0.14
206	1	172	191	--	177	80	--	1.03	0.42	--
215	1	201	209	--	223	180	--	1.11	0.86	--
Mean	*5*	*168*	*243**	*41*	*165*	*104*	*51*	*1.06*	*0.49**	*0.23*

[1] Standard deviation of the mean for measured values in the field experiments.

[2] If the previous crop was a legume, the standard N rate was adjusted as follows: ((Std Optimum Yield x Std N factor) – legume credit); legume credit was 22 lb N/ac for soybean and 30 lb N/ac for peanut.

[3] If the previous crop was legume, the measured N factor was adjusted as follows: (Mea. Optimum N Rate + Legume Credit)/(Mea. Optimum Yield).

* Indicates the 95% confidence interval is different between the standard and measured values.

Comparisons of mean optimum yields, optimum N rates and N factors between the standard (Std.) RYE database and measured (Mea.) field values from experiments with different tillage practices.

		Optimum Yield			Optimum N Rate			N Factor		
Tillage	**N**	**Std.**	**Mea.**	**SD[1]**	**Std.[2]**	**Mea.**	**SD**	**Std.**	**Mea.[3]**	**SD**
			bu/ac			lb N/ac			lb N/bu	
Conventional	21	141	172	52	137	134	53	1.09	0.96	0.42
No-till<10 yr	18	132	152	37	125	127	28	1.08	1.00	0.27
No-till>10 yr	7	135	177*	20	127	135	37	1.08	0.86*	0.13

[1] Standard deviation of the mean for measured values in the field experiments.
[2] If the previous crop was a legume, the standard N rates was adjusted as follows: ((Std Optimum Yield x Std N factor) – legume credit); legume credit was 22 lb N/ac for soybean and 30 lb N/ac for peanut.
[3] If the previous crop was legume, the measured N factor was adjusted as follows: (Mea. Optimum N Rate + Legume Credit)/(Mea. Optimum Yield).
* Indicates the 95% confidence interval is different between the standard and measured values.

Comparisons of mean optimum yields, optimum N rates and N factors between the standard (Std.) RYE database and measured (Mea.) field values where corn was preceded by different crops.

Previous		Optimum Yield			Optimum N Rate			N Factor		
Crop	**N**	**Std.**	**Mea.**	**SD[1]**	**Std.[2]**	**Mea.**	**SD**	**Std.**	**Mea.[3]**	**SD**
			bu/ac			lb N/ac			lb N/bu	
Corn	5	132	146	23	144	167	58	1.09	1.15	0.34
Cotton	1	135	120	--	150	120	--	1.11	1.24	--
Fallow	2	186	200	13	200	130	71	1.07	0.64	0.31
Peanut	1	115	179	--	101	168	--	1.14	1.11	--
Potato	1	135	150	--	150	105	--	1.11	0.70	--
Soybean	35	135	167*	46	125	126	38	1.09	0.95*	0.34
Wheat	1	120	183	--	130	134	--	1.08	0.73	--

[1] Standard deviation of the mean for measured values in the field experiments.
[2] If the previous crop was a legume, the standard N rates was adjusted as follows: ((Std Optimum Yield x Std N factor) – legume credit); legume credit was 22 lb N/ac for soybean and 30 lb N/ac for peanut.
[3] If the previous crop was legume, the measured N factor was adjusted as follows: (Mea. Optimum N Rate + Legume Credit)/(Mea. Optimum Yield).
* Indicates the 95% confidence interval is different between the standard and measured values.