Fluid Fertilizer Foundation

Fluid Facts

FERTILITY COMPONENTS CRITICAL FOR HIGH YIELD CORN

Specific practices that have been rapidly and widely adopted in the High plains include strip-till and no-till, increased starter fertilizer use as a result of 2x0 surface banding, and movement away from 100 percent preplant N application to sidedress and fertigation applications. Other practices that have shown high adoption rates include in-season N application to fine tune N inputs and an increase in banding of nutrients such as P and K in lieu of broadcast applications. A promising new practice is center pivot applied UAN fertilizer at the R2 to R4 growth stages to improve corn yield through increased kernel depth and test weight. This practice allows later in-season adjustments of N application when environmental conditions favor higher or lower yield potential.

Fertility Management Revisions

Banding. *Banding nutrients is better than broadcasting for positional availability in strip-till and no-till.*

Starter fertilizer. *Evaluations were made for surface banding starter fertilizer two inches from the seed slice (2x0 placement) at the time of planting. On-farm research showed combinations of pop-up plus 2x2 or 2x0 to be best. Also, precision guidance systems have made possible preplant "hot" band 6 to 8 inches below the seed applied preplant during strip-till, followed by planting over the band and using in-furrow pop-up starter which also performed very well.*

Nitrogen. *Multiple applications of N are more efficient and result in higher yields (preplant, starter, pre-tassel applications through pivot or sidedress, and post-tassel applications).*

Additionally, multiple applications improved N use efficiency and reduce potential for stalk rot organisms to infect corn stalks.

Post Tassel N Applications

Post-tassel (post-flowering) applications of N can increase yields by increasing kernel depth and test weight. In Dupont/Pioneer research, applying a significant portion of the applied N at brown silk averaged 31 bu/a more than applying all N before tassel. Modern hybrids can respond well up to 33 percent of N rate goal going on between brown silk and dough stage.

Recent Purdue research has shown that the newest corn hybrids use more N post-tassel than the hybrids of several years ago.

Effect Of Late UAN Application On Corn Yield
Dupont/Pioneer, 2010

All N Applied Before Tassel *19 Plots*	Portion Of N Applied At Brown Silk *21 plots*
Avg Yield 217 bu/acre	Avg Yield 248 bu/acre
Low yield: 170 bu/acre High yield: 269 bu/acre	Low yield: 183 bu/acre High yield: 302 bu/acre
3 plots over 240+ bu/acre	14 plots over 240+ bu/acre

Era of Corn Hybrids and Time of N Uptake

Era Of Hybrid Release	N at R1	N at R6	Post-flowering N Uptake	Increase in post-flowering N Uptake
	lbs N/A			%
Old (1940 to 1990) [a]	102	145	43	28%
New (1991 to 2011) [a]	97	152	55	
Old (1970) [b]	125	162	37	40%
New (2000) [b]	125	177	52	

[a] Ciampitti and Vyn, 2012 [b] Haegele et al., 2013

Author Credit

Russell French is CCA and DuPont/Pioneer Account Manager, Robert Bowling is a DuPont/Pioneer Field Agronomist, Alyssa Abbott is a DuPont/Pioneer Account Manager and Mike Stewart is Central and Southern Plains Regional Director for IPNI.

Full paper is available from the Winter 2015 Fluid Journal
http://www.fluidjournalonline.com

FLUID FERTILIZER FOUNDATION
fluidfertilizer@fff.kscoxmail.com
fluidfertilizer.com