FLUID facts THE NATIONAL FERTILIZER SOLUTIONS ASSOCIATION

Fertilizer Placement

Overcoming Inefficiencies of Broadcast Applications

Option 1: Surface banding fluid fertilizers can help overcome the inefficiencies of broadcast applications and eliminate the equipment requirement for sub-surface placement.

Surface banding is rapidly done with existing broadcast equipment without additional fuel. The bands may then be incorporated.

Option 2: Although research has demonstrated that knifing fertilizer into the soil can produce highest yields in many situations, growers have not adopted this practice because of equipment and time.

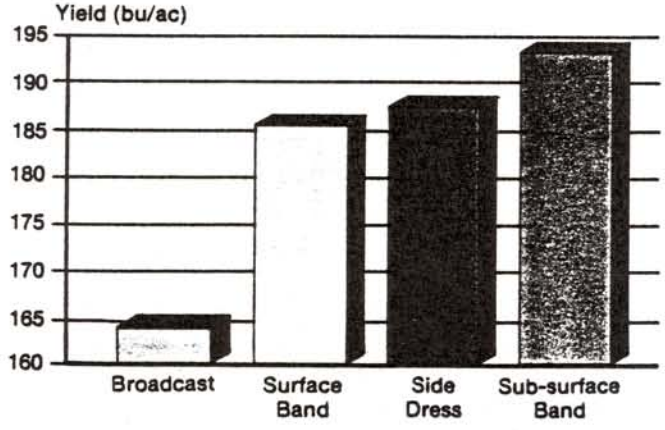
Sub-surface banding may be more practical than you think! Knifing in fluid fertilizer has the potential to improve nutrient use by crops in no-till, ridge-till and bedded systems.

Broadcast Inefficiencies

- *Greater loss of nutrients due to erosion.*
- *More phosphate and potash tie up with the soil. Broadcast nutrients have greater chance of reacting with soil compounds and particles which make nutrients less available to crops.*
- *More volatilization losses of urea nitrogen from the soil surface.*
- *More biological tie up of nutrients in breakdown of surface residues.*
- *Nutrients more available to weeds.*
- *Fertilizer is not adequately placed in the root zone with reduced tillage systems.*
- *Fertilizer is placed in compacted row middles where roots may have little growth.*
- *Fertilizer cannot enter soil solution at shallow depths during dry conditions.*

Banded Placement Has Yield Edge

Fertilizer placement studies in 1985 by the University of Nebraska on no-till irrigated corn, show 21 to 29 bu/ac increase over broadcast, with the same amount of fertilizer surface or sub-surface banded.

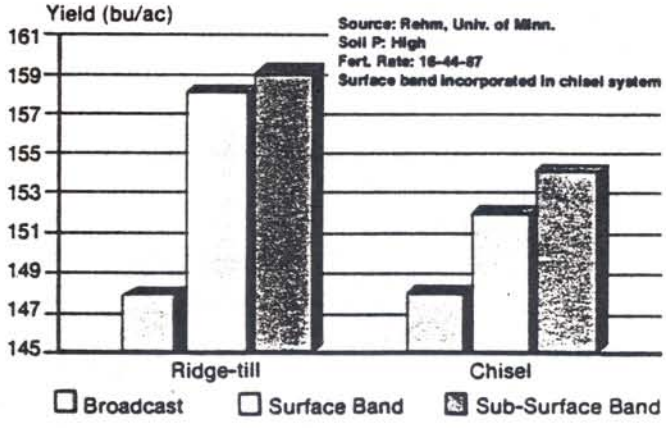


Source: Havlin, Univ. of Neb.
Soil test P: Medium
Fert. Rate: 250-40-0-20S

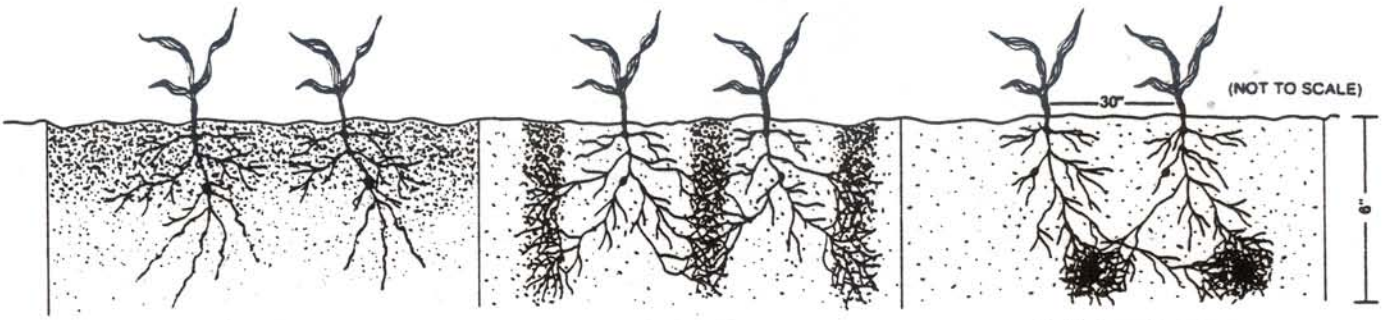
Profit Note: For the 29 bu/ac increase at $2.40/bu that's $69.60 per acre more profit by banding than by broadcasting fertilizer. Correct application of N and P pays!

Bands Improve Ridge-Till Yields

Bands concentrated in the root area tend to produce higher corn yields than broadcast fertilizer in Minnesota on a soil testing high in P. Placement in soils testing high in P and K may be more important for ridge-till than a chisel plow system. Other Minnesota data have shown definite benefits of banding on soils low to medium in soil nutrients.



Profit Note: Researchers and fertilizer dealers have tested and demonstrated the value of banding fertilizer. Strip or preplant bands can enhance yields in many situations. If costs are similar to traditional methods, these application techniques may prove advantageous to you!



Placing your fertilizer where it has the best chance to be taken up by the plant rather than being tied up by the soil is the message of this Fluid Facts. The figure above illustrates the distribution from broadcast, surface band and deep banding in a chisel-disk system.

New Study Shows Optimum Soil Volume to Fertilize

Dr. Stan Barber, Purdue, has established a procedure to determine the volume of soil to fertilize that gives the most efficient uptake of P by corn and soybeans. Evaluating 33 different soils he found they vary in their ability to tie up P and provide P availability to plant roots.

For example, maximum uptake of P in a Clarion soil (see chart) occurs when 10 percent of the plow layer is fertilized using a banded application. This is an 86 percent improvement in P use efficiency when compared to broadcast. You can fertilize too little or too much soil, depending on a soil's chemistry. Barber indicates that the potential for best P & K uptake is when 2 to 20 percent of the plowed soil volume is fertilized.

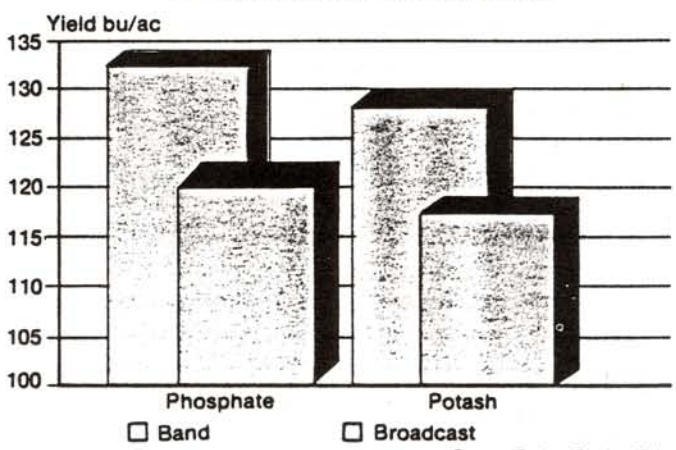
Fertilizing for Maximum P Uptake Efficiency

Location	Soil	Percent of Soil To Fertilize	Percent Improvement Over Broadcast
Manitoba CN	Almasippi	5	63
Illinois	Ayrshire	10	73
Ohio	Canfield OK	5	48
Indiana	Chalmers	5	54
Iowa	Clarion	10	86
Colorado	Colby	10	38
Ohio	Crosby	2	113
Alabama	Decatur	2	82
Illinois	Flanagan	5	154
Minnesota	Hubbard	2	327
Tennessee	Memphis	2	120
Colorado	Platner	10	212
Iowa	Taintor	5	359
Indiana	Toronto	5	148

Early Purdue Studies Give Advantage to Banding P & K

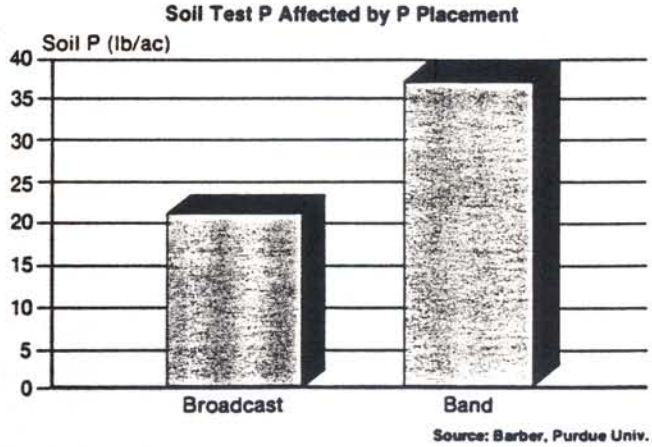
Dr. Barber also established that over a five-year period corn yields were higher when P or K was applied as fall surface bands (strips) and plowed in than when broadcast and plowed in. Residual soil test P values were also higher when surface bands were used. The higher yield and available P in the soil were attributed to reduced tie up of fertilizer P in the band application.

Yields Affected by P and K Placement



Source: Barber, Purdue Univ.

Soil Test P Affected by P Placement



Source: Barber, Purdue Univ.

Profit Note: Both P and K surface bands each gave an 11 bu/ac yield increase over broadcast. At $2.40/bu for corn, that equals $26.40 more return by using surface bands.

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