# THE LEADING EDGE

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**A PUBLICATION DEDICATED TO MAXIMIZING YIELD POTENTIAL**

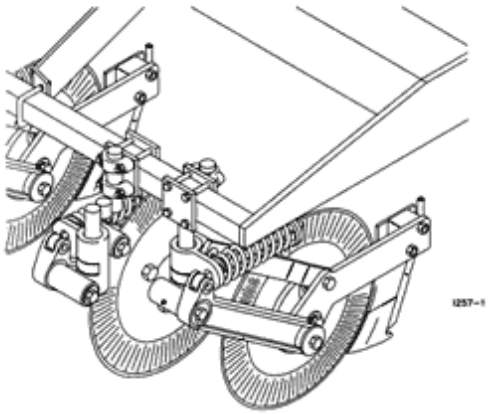
## Maximizing the Benefits of Zone Tillage & Coulter Tillage

### √ Zone Tillage

Zone tillage is the indirect loosening of an area of soil between two coulter blades which are stagger mounted on either side of a planter row. The following are some key points to keep in mind when planning for a zone tillage setup.

- Zone tillage allows for effective loosening of the soil in the seed placement area while allowing for the use of a planter unit mounted residue clearing device. The residue clearing device will promote early germination due to soil warm up without the need for additional tillage.

Illustration of zone tillage setup.



- To effectively loosen the area of soil between the coulter blades without burying residue, it is recommended that narrow profile coulter blades be used. The narrow profile blades will fracture and lift the soil without causing excessive tillage of the soil.
- By using narrow profile blades to merely fracture the soil, moisture in the seedbed will be maintained.
- Excessively tilling and turning the soil will warm up the ground at a faster rate, however much needed moisture will be lost due to soil being overly exposed to the air.
- Excessive tillage may bring weed seed to the surface where it can germinate causing future problems with weed control.

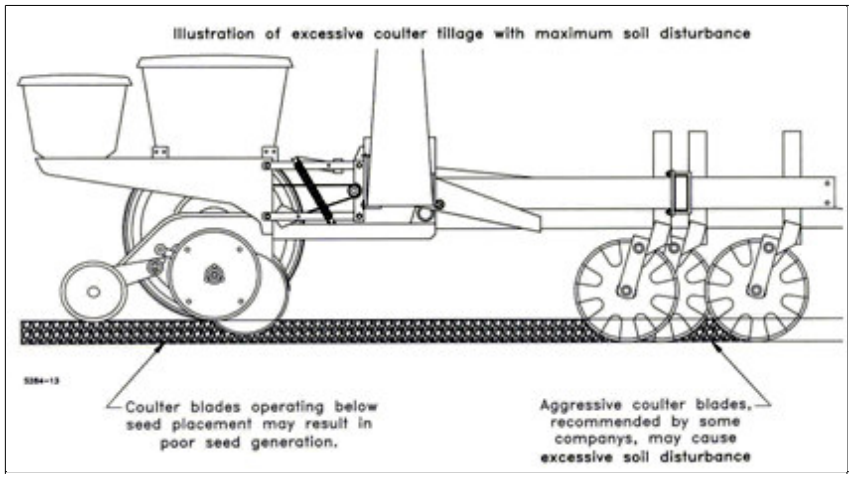
### √ Coulter Tillage

Coulter tillage is the direct loosening of soil by a coulter blade.

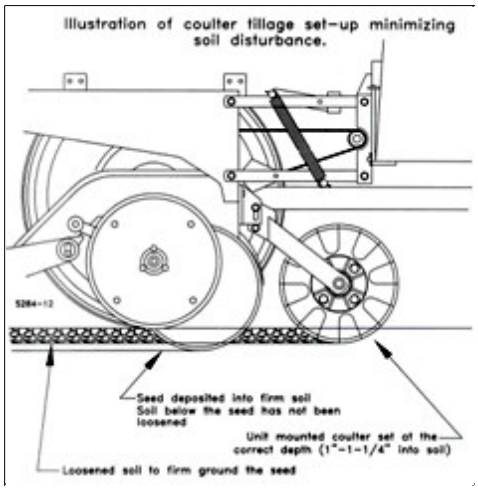
This can be accomplished using a single coulter or the combination of several coulters. The coulters should be able to accommodate a variety of blade styles to match changing soil types and soil conditions. The following are some key points to keep in mind when planning for a coulter tillage setup:

- Coulters operating directly in-line with the planter row unit should never engage the soil at a depth below seed placement. There are several reasons for this:

1. loosened soil below the seed can develop air pockets which will affect seed germination because of poor soil to seed contact.
2. loosened soil below the the seed may settle, especially after a rain, causing the seed to drop below the desired planting planting depth.
3. deeply working the soil in this area will reduce much needed moisture.




- Coulters operating directly in-line with the planter row should provide a wide enough area of loosened soil to overcome any potential compaction from the seed double disc openers and to allow for sufficient firming around the seed.




- Coulters mounted on the planter frame should be adjustable for variable depth settings in varying soil conditions.

- Coulters mounted on the planter frame should in most

installations be allowed to pivot. Rigid mounted coulters can undergo and transfer to the planter excessive amounts of stress, especially when negotiating a turn or upon encountering heavy obstructions such as rocks.

- Excessive coulter tillage can bury residue making it difficult for the residue clearing device to remove it.
- Coulter tillage with aggressive coulter blades can lead to soil erosion problems on contoured ground.

### √ Fertilizer Applications in Zone Tillage and Coulter Tillage

In most cases, it is recommended that fertilizer be applied at a localized point slightly below and to the side of the seed placement area. Misplaced fertilizer could prove less effective or result in germination failure. The following are some key points to remember when applying fertilizer in the previously discussed applications:

Fertilizer coulters should be equipped with narrow profile blades. These blades will provide a clean narrow slot in which fertilizer may be placed.

Careful consideration should be given coulter blade selection for fertilizer application. Incorrect blade selection can result in the following:

1. insufficient soil penetration may cause shallow placement
2. aggressive coulter blades may throw soil and disrupt fertilizer placement
3. overly tilled moist soil may build up on the seed double disc opener gauge wheels.

The difference between knife style applicators and injectors:

1. fertilizer knives ensure pinpoint placement
2. knife style applicators require more frequent knife to coulter blade adjustment
3. injectors apply fertilizer in a band (the lower the pump pressure, the poorer the accuracy range).
4. injectors which are supplied by low pressure pumps may dribble fertilizer on the soil surface instead of at the desired depth.
5. injector orifice size and pump pressure should be matched to required gallonage per acre.

| Problem | Possible Cause in Zone Tillage | Possible Remedy |
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| Seed trench not closing | Insufficient soil loosening | Move coulters closer together and ensure that in operation the planter is level. |
| Poor soil to seed contact | Soil is being loosened below the seed | Move the coulters farther apart, use less aggressive blades |
| Excessive residue loss | Aggressive coulter blades are burying residue | Use a narrow profile coulter blade |
| Hairpinning of residue in the seed trench | Residue is not being cleared | Use a residue clearing device to move residue without engaging the soil |
| Planter skipping, erratic seed spacing, drive wheels lifting off the ground | Planter lacks ballast to keep the coulters in the soil | Add ballast to the planter |
| **Problem** | **Possible Cause in Coulter Tillage** | **Possible Remedy** |
| Poor seed to soil contact | Coulter mounted ahead of the planter row unit is running too deep | Set coulter 3/8” shallower than planting depth |
| Uneven planting depth and seed placement | Excessive soil disturbance leaving rough, uneven path for row unit gauge wheels to follow causing row unit bounce<br><br>Coulter mounted ahead of the row unit is running at inconsistent depths | Use a planter unit mounted coulter that will maintain a consistent depth relationship to that of the row unit |
| Weeds emerging in seedbed area | Excessive tillage bringing weed seed to the surface where it can germinate | Use less aggressive coulter blades or switch to a zone till system |

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| Poor seed germination | Seed which is located too close to like residue may become subject to alleopathic poisoning (ex.corn following corn) | Use a residue clearing device which moves residue instead of incorporating it into the soil |
| | Overly aggressive blades are tilling the soil instead of opening a slot for fertilizer placement | Use a narrow profile blade to open a clean narrow slot |
| Poor seed emergence in a dry year | Excessive tillage causing additional moisture loss in the intended seedbed | Use less aggressive coulter blades or switch to a zone till system |
| Planter skipping, drive wheels lifting off the ground | Planter lacks ballast to keep the coulters in the soil | Add ballast to the planter |
| Uneven seed spacing and depth | Excessive residue in the seed trench | Use a residue clearing device which moves residue instead of incorporating it into the soil |

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