

DRILLED SOYBEAN RESPONSE TO WIDE BED SYSTEMS

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INTERPRETIVE SUMMARY

In North Mississippi about 46% of the soybeans are grown in a drill-narrow row (≤ 20 inches) pattern on flood plain soils. Most of this acreage is planted in Maturity Group (MG) VI, which mature in mid to late October and most often are harvested in November under muddy field conditions that result in rutted fields. Rutted fields have increased compaction, reduced drainage, and the following year often delays spring tillage and soybean planting.

When planted in late April or early May, MG IV and V varieties are as productive as MG VI varieties and have the advantage of dry field harvest conditions for September/early October harvest. The September/October harvest also allows time for late-season fertilizer application and land preparation (if necessary). However, early planting of MG IV and V varieties under current flat tillage production systems on these flood plain soils may result in stand losses and poor growth, especially when wet soil conditions occur in late April and early May. Therefore, wide raised bed (80 and 120 inch) production systems were evaluated with a productive MG IV and V variety planted early May in 7.5 (1996 and 1997) and 15 inch rows (1998-2000).

A 5-year (1996-2000) study was conducted on a Leeper silty clay loam soil (fine, montmorillonitic nonacid, thermic chromudertic Haplaquepts) as a split-split plot with years as main plot, varieties as sub-plots and tillage as sub-subplots at the Northeast Branch Station. Plots were 20 ft x 500 ft long with 3 replications. Tillage treatments were: no-tillage wide-bed (80 and 120 inches), fall one-pass chisel-bedder-harrow wide bed (80 and 120 inches), flat stale seedbed (fall chisel-harrow), and flat no-tillage. The no-tillage wide beds were formed with a one-pass chisel-bedder-harrow in the fall of 1995 and repeated in the fall of 1998. MG IV and V soybeans were planted no-till on all treatments in early May. In the borders of each replication of the study, a disk twice in the spring (late April - early May) plus field cultivate (prior to planting MG VI soybean in early June) conventional farmer production system was included. Good agronomic practices were applied to all treatments and soybeans were harvested within 7 days after maturity.

Five year (1996-2000) yield analysis indicated a year by variety and a year by tillage interaction. Three (1996, 1997, and 1999) of 5 years tillage had no effect on yield. However,

the fall chisel-harrow system had higher yield than all other treatments in 1998 and had higher yield than flat no-tillage and no-tillage 80 inch wide beds in 2000. The MG V variety had higher yield than MG IV variety 4 (1996-99) of 5 years with 4-year average of 38.1 bu/A compared with 31.7 bu/A for MG IV. In 2000, MG IV soybean produced 36.6 bu/A compared to 32.7 bu/A for MG V. Observation indicated that all 5 years of the study, both MG IV and V soybean produced yield equal to or greater than the MG VI variety in the conventional farmer production system. However, the MG IV soybean, during extended dry periods, showed more sensitivity to iron-chlorosis than MG V or MG VI soybean with symptoms more prevalent in no-tillage. MG IV, V, and VI soybeans matured each year about mid-September, early October, and late October, respectively.

These 5-year results indicate that raised beds were not necessary for high yield with May planted MG IV or V soybeans. These results also indicate that North Mississippi soybean growers have the opportunity to improve profitability with stale seedbed production systems in combination with productive MG IV or MG V soybeans. Stale seedbed production systems would avoid rutting fields, allow growers to perform fall tillage when necessary, and focus on planting soybeans in a more timely manner in the spring of the year.