

## **Precision fertilization using sub-surface drip irrigation (SDI) for site-specific management of cotton.**

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This study was installed in 2005 to test four replications of four fertigation treatments and one non-fertigated control. The objective is to vary nitrogen and potassium timing across the growing season to test four fertilization management scenarios. Fertilization management is readily accomplished using automated individual injection pumps plumbed into sub-surface drip irrigation (SDI) tape.

There are no yield results for 2005 since the first year project plan called for site preparation, purchase of equipment, and installation of the system. Approximately 7,500 feet of SDI tape with associated supply and flush lines, control valves, and air-vacuum release was installed on four test plots during 2005. Fertilizer injection equipment is currently being purchased in readiness for the current 2006 growing season. Equipment and installation expenses were offset by in-kind support from a drip tape manufacturer and other funding agencies.

Additional funding will be sought this year to instrument each fertigation treatment with remote flow monitoring and chemical injection monitoring. Automated monitoring will provide real-time monitoring of fertigations, allowing us to verify continuous operation of the system.

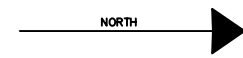


SDI tape installation (13-15" depth). Belle Mina, AL, May 25, 2005.

# Drip Tiers 5 - 8 row treatments (2005)



SDI Fertigation Management Study (Drip Tiers)  
Schematic Drawing  
Belle Mina, Alabama  
May 2005

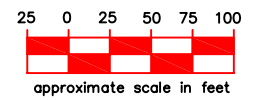
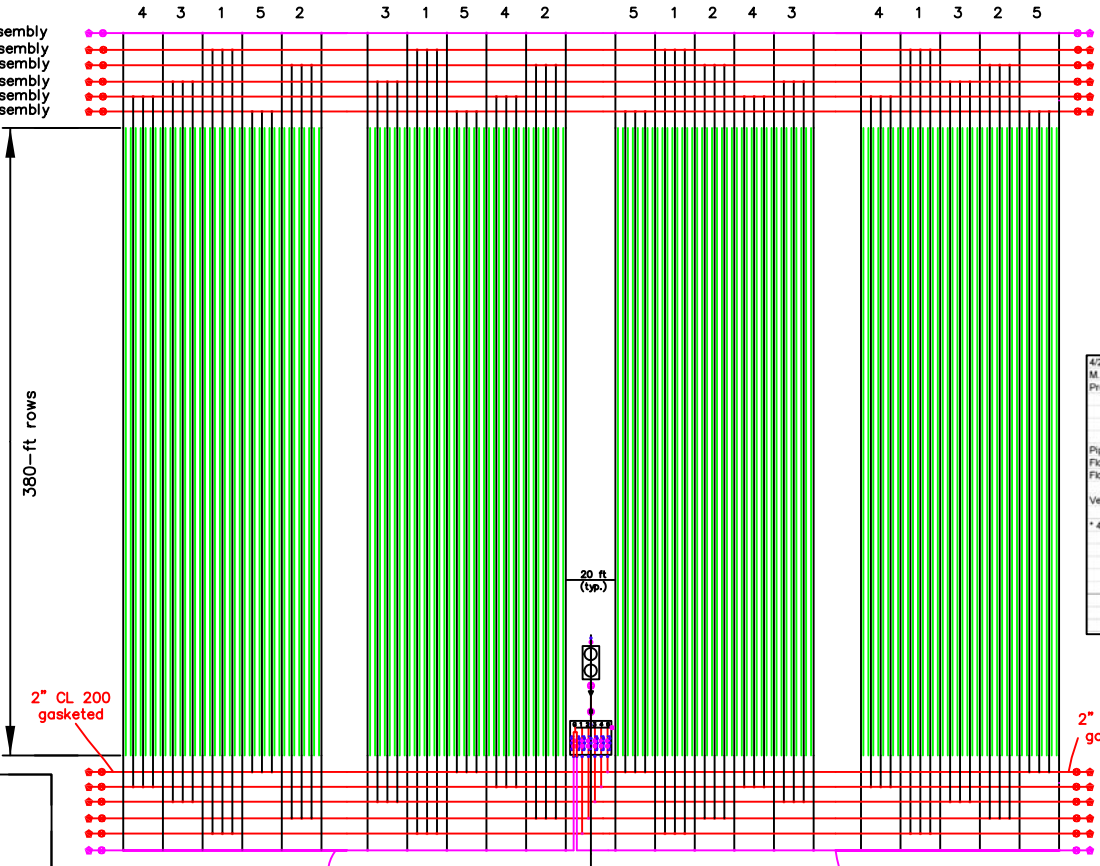
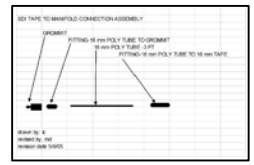
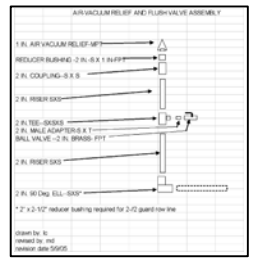


21 rows SDI tape\*  
142-ft blocks (tiers)

- guard row vacuum/air flush assembly
- trtmt 1 vacuum/air flush assembly
- trtmt 2 vacuum/air flush assembly
- trtmt 3 vacuum/air flush assembly
- trtmt 4 vacuum/air flush assembly
- trtmt 5 vacuum/air flush assembly

- guard row vacuum/air flush assembly
- trtmt 1 vacuum/air flush assembly
- trtmt 2 vacuum/air flush assembly
- trtmt 3 vacuum/air flush assembly
- trtmt 4 vacuum/air flush assembly
- trtmt 5 vacuum/air flush assembly

\*SDI tape located between every other row of cotton and at ends (total 40 rows cotton per plot)



Design flows:

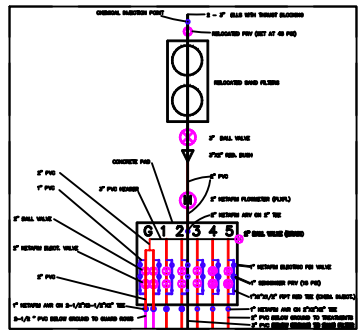
4/25/2005 M. Dougherty and L. Curtis Project Belle Mina Drip Tier Plot	single-row	recommended flushing range	calculated flushing rate in header for guard rows for 1/2 system				
			0.874	0.874	0.874	2.067	0.874
Pipe size ID (inch)	0.874	0.874	0.874	2.067	0.874	2.067	2.469
Flow (gph)*	43.2	170	225	2700	2700	3240	3240
Flow (gpm)	0.72	2.83	3.75	45	45	54	54
Velocity (fps)	0.39	1.52	2.01	4.30	24.07	5.16	3.62

\* 43.2 gph = 360 feet x .24 gph/LF / (2 emitters/ft)

	individual row flow (gpm)	1/2 total treatment flow	Total treatment flow	1/2 total flushing flow (1.5 fps min) (2 fps min)	total flushing flow (1.5 fps min) (2 fps min)
treatment	0.72	4.32	8.64	21.3	26.92
guard row	0.72	8.64	17.28	42.6	53.64

2" CL 200 gasketed

2" CL 200 gasketed



ABOVE-GROUND VALVE HEADER

- trtmt 5 supply manifold w/ flush assembly
- trtmt 4 supply manifold w/ flush assembly
- trtmt 3 supply manifold w/ flush assembly
- trtmt 2 supply manifold w/ flush assembly
- trtmt 1 supply manifold w/ flush assembly
- guard row supply manifold w/ flush assembly

NOTE: BEFORE PERMANENT INSTALLATION OF MANIFOLDS, RUN FLOW TEST TO ASSURE MINIMUM 55 GPM OUT OF FILTER.

water supply from reservoir