Nursery Cooperative MANAGEMENT ALERT 2010 - 02

Record Rainfall in the Fall of 2009

Last year, the western region of the South (AR, KS, LA, MS, OK, and TX) experienced the most rainfall for October since 1895 (an average of 7.39 inches). Then in December, another 115-year record was broken for the southeast region (AL, FL, GA, SC, NC and VA; an average of 8.06 inches). October records were set in AR, LA, MS and December records occurred in NC, SC, and VA (see table). The wet soils in the South not only drove up the price of pulpwood, but it also had a negative effect on seedling survival. Some tree planting was delayed until late February and March. Planting late in the season typically does not allow enough time for seedling roots to become established before the spring droughts. Planting seedlings deeply (i.e. root collar 6 inches below the surface) can increase the chance of survival of loblolly pine and slash pine. However, many inexperienced planting inspectors penalize tree planters when they do a good job of planting trees deeply. Deeper planting may explain why, on some sites, machine planting can result in a 10 to 20% increase in survival when compared to hand-planters. Monthly rainfall amounts (2009) for selected southern states are listed in the following table.

Rainfall (inches) in 2009 by state (as reported by NOAA) and the total amount of rainfall that is in excess of the average for these months. Values listed in bold indicate a record amount of rainfall since 1895.

	October	November	December	Inches above normal
Alabama	7.14	4.53	10.59 (3rd)	10.62
Arkansas	**14.35**	1.69	6.95	10.87
Georgia	5.78	4.11	9.25	9.44
Louisiana	**13.56**	1.77	10.36 (5th)	12.48
Mississippi	**9.84**	1.93	8.82	8.12
North Carolina	2.98	6.87	**7.33**	7.2
Oklahoma	7.04	0.67	1.43	2.13
South Carolina	4.88	4.84	**8.42**	8.97
Tennessee	6.71	2.00	5.76	2.6
Texas	5.65	1.33	2.26	2.81
Virginia	3.00	6.68	**7.04**	7.62

Waterlogged conditions in the nursery can adversely affect the physiology of pine seedlings. At some loamy sand nurseries, seedling quality is reduced with 2 inches of rain per week for a period of three weeks or more (during October and November). When seedlings are lifted just after a period of anaerobic soil and transplanted in December or early January, a quick death can result due to a lack of new root growth (death often occurs from the roots up as opposed to from the tops down). We have inspected several plantation failures in the past that were not caused by poor planting practices (e.g. shallow planting holes). Symptoms included blackened root surfaces, over-development of lenticels, no new root growth, rapid mortality, and seedlings dying from the roots up. In some cases, root systems deteriorated quickly when seedlings were stored under refrigerated conditions for three weeks or less. It is likely that excessive rainfall in 2009 reduced seedling quality at some nurseries. The next time too much rain occurs in the fall, managers should check each field (a month prior to lifting) to determine which units or families are exhibiting the highest percentage of lenticels. A 21-day RGP test can be conducted on seed-lots that are suspected of suffering from anaerobic conditions. For more detailed information, see the following paper: http://www.rngr.net/publications/proceedings/1998/SouthB/at_download/file

South, D.B., Carey, W.A. 1999. Excessive rainfall prior to lifting adversely affects seedling physiology. in: Landis, T.D.: Barnett, J.P., tech. words. National proceedings: forest and conservation nursery associations-1998. Gen. Tech. Rep. SRS-25. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station: 63-64.

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