Good growth conditions needed for roots

NEWARK, Del. – It's the roots below the plow layer, down in the subsoil, that carry corn and soybean plants through short periods of moisture stress. As roots go deeper, the supply of available moisture increases. But roots don't go deep on comand. They move in the direction of a favorable environment, points out University of Delaware Extension agronomist Dr. William H. Mitchell.

Good aeration, a favorable pH, an adequate supply of nutrients and available moisture are some of the factors that make good growing conditions for roots. Unfortunately, it is difficult to improve growing conditions in the subsoil. Subsoiling is the most practical approach to the problem, but the effects are often temporary and result in little or no yield increase.

Many of the cultivated, sandy soils of lower Delaware have compacted layers – or traffic pans – at the 10 to 15 inch depth. A close look at corn root systems in 30 irrigated fields on this type of soil shows that shallow rooting is a result of too little water. The agronomist examined corn plants in these fields for members of the "First State Irrigation Project", an Extension program aimed at helping local farmers attain the 200 bushel an acre yields he and his colleagues at the University say are possible with proper crop management.

Mitchell's findings don't support the popular belief that an early-season drought will cause corn roots to go deeper into the soil in search of water. On the contrary, it appears that as the season progresses and plants remove water from compacted layers, the soil becomes hard and almost impossible for roots to penetrate.

This may be the principal reason for the shallow root systems that develop in many corn fields. On several farms where plants were well irrigated, the agronomist found roots at 30 to 40 inch depths. On the other hand, in almost all cases where a moisture stress developed early in the season, corn leaves responded by rolling or twisting and roots were found to be only 12 to 15 inches deep. "Drought doesn't make roots go deeper," says Mitchell. "It may, in fact, cause a very shallow root system to develop."

Swollen, club-like root tips are characteristic of the growth in compacted soil which occurs under drought conditions. This abnormal growth is usually found where roots have passed through the moist and more easily penetrated plow layer and then, as water supplies diminish, come in contact with hard, compacted soil at the 10 to 12 inch depth.

Efforts to correct this problem by subsoiling have been disappointing. Placing subsurface irrigation lines at the bottom of a subsoiling trench has produced a dramatic increase in corn yields, but it appears this has been a result of irrigation and not subsoiling, reports the agronomist.

The subsoil contains plant nutrients such as potassium and manganese as well as badly needed moisture, but these are of little value if there isn't enough rainfall or irrigation to permit roots to penetrate this layer of soil.

Order 4 to be amended

WASHINGTON, D.C. – Under a U.S. Department of Agriculture final decision, the current method of pricing Class I – or fluid use - - milk under the Middle Atlantic federal milk marketing order would be continued, but some other order provisions would be changed.

Herbert L. Forest, dairy official with USDA's Agricultural Marketing Service, said the amended order still must be approved by at least two-thirds of the dairy farmers operating under the order if the changes are to go into effect. USDA will poll cooperative associations in the market to determine producer approval.

Forest said this final decision is the same as the recommended or tentative decision published in the April 27 Federal Register. The tentative decision was based on a public hearing in Philadelphia last October.

The present method of pricing Class I milk under the order, Forest said, is a basic formula, plus a $2.78 Class I differential. The Minnesota-Wisconsin price serves as the basic formula price under the Middle Atlantic order.

Maintaining this pricing method is essential, Forest said, because the Middle Atlantic price formula is an integral part of a coordinated pricing system for federal milk orders. This coordination is needed to keep Class I prices aligned among handlers on a continuing basis, and to permit milk to move easily among markets, Forest explained.

The decision denies a proposal for a bracketed pricing system and proposals to lower the Class I differential from its present $2.78. Requests by handler and producer groups to reopen the hearing to reconsider the Class I differential issue also were denied.

Proposed order changes would relax provisions for pooling a distributing plant and for diverting producers' milk to nonpool plants when it is not needed for fluid use at a distributing plant. Still another change would allow operators of partially regulated plants to increase Class I sales in the Middle Atlantic order area to a limited extent without becoming fully regulated under the order.

Copies of this final decision may be obtained from Market Administrator Joseph D. Shine, 300 N. Lee St., Rm. 320, Alexandria, Va. 22313; or from the Dairy Division, AMS, USDA, Washington, D.C. 20250.