



# Modern Ag Product

## BIOBASE...IMPROVED WATER MANAGEMENT

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The management and efficient use of water is one of the larger challenges facing irrigated growers. Water represents a major production cost and efficient water management is the key to utilizing other production inputs.

Water is by far the most abundant component of living tissue including leaves, stems, roots, and fruit. Fresh plant tissue will normally contain 70 to 90 % water. Water serves a number of absolutely essential physiological functions in the plant. In the cellular protoplasm, water acts as a solvent and actual structural component of proteins and nucleic acids. Water serves as a substrate for photosynthesis and is one of the major products of respiration. Water is the predominate source of hydrogen and oxygen used in the synthesis of carbohydrate, proteins, fats, and vitamins. Water also serves a critical role in nutrient uptake and temperature regulation of plants. Water along with dissolved mineral nutrients, is taken up by crop roots and moves upward through the vascular system by a process called transpiration. Transpiration functions in the uptake and translocation of nutrients and also regulates the internal temperature of the crop plant.

The critical importance of irrigation scheduling makes water management an important consideration in any Modern Ag Products crop program.

Modern Ag Products soil products such as BioBase initiate soil struc-

ture changes which can produce a direct positive effective on soil water relationships. Soil characteristics which influence soil water relationships include soil biological activity, soil texture, soil structure, salt content, soil depth, and soil stratification. BioBase stimulates and enhances beneficial soil microbial activity which improves flocculation, enhances humus formation, buffers salts, and reduces stratification.

Pore space will occupy 50% or more of the total volume in a biologically healthy soil. As moisture is applied to a well aerated and flocculated soil the water enters soil pores (large and small) and displaces air. Continued application of water results in further downward movement and air displacement until the soil reaches its maximum retentive capacity or saturation point. As water application is stopped, the downward movement of water continues in response to gravity. This gravitational movement eventually slows and finally stops. The water content of the soil at this point is referred to as field capacity. Field capacity is the relatively stable point where water has moved out of large soil pores and is replaced with air. The smaller pores remain filled with water held in place by attractive forces in the soil. Capillary water held at field capacity provides the moisture that a growing crop will take up and use. If additional water is not added, a growing crop will eventually deplete the capillary water and the crop will reach its wilting coefficient. Wilting coefficient is the point where

transpiration rate exceeds the absorption rate. The permanent wilting point is reached when only hygroscopic water is left in the soil and is held too tightly for uptake by crop plants.

The continued use of BioBase can and usually will significantly change these basic soil-crop water relationships. Soil treated with BioBase will take up water faster and retain more water before saturation. Increased pore space allows more water to be held at field capacity and enhanced humus levels enable crop plants to extract more water before the wilting point is reached. Modern Ag Product treated soils may require less frequent irrigations and care should be taken that crops are not over-watered. Over irrigation can result in water logging, excessive nutrient leaching and salt accumulation.

Crops grown with a balanced nutritional program using Modern Ag Products Complexed fertilizers and foliar nutrients will more efficiently utilize available moisture. Crops take up water as a result of capillary movement of water into the root zone and continued root growth into moist soil. Crops grown with a balanced nutritional program will establish extensive root systems that are better able to take up and utilize available moisture.