

Land-use and its effect on soil conservation catchment management in north - western New South Wales

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Over recent decades significant changes in land use have occurred in north western NSW. The change from a dominant land use to a dominance of cropping has dramatically changed the role of soil conservation management.

Under pastoral land use, changes to the hydrological condition of the catchment were only considered serious erosion hazards in times of drought or severe overgrazing when large areas were denuded of vegetation. The normal pastoral situation was of savannah woodland or grassland on the flat and undulating country with the ridges and rocky outcrops left fully timbered. Runoff was usually slow under these conditions with high interception of raindrops by vegetation and high infiltration of water into the soil profile.

Cultivation of large areas of such catchments has reduced the vegetative cover, caused a loss of soil structural stability and removed many stable, natural drainage lines. Rainfall now falls on large areas of unprotected soil which has a reduced stability and infiltration rate. The increased runoff which results, now flows directly downhill at a higher velocity over the bare surface causing massive soil erosion, silt deposition and flooding.

To compensate for these land use changes, the Soil Conservation Service now seeks the implementation of conservation tillage practices in an integrated approach to catchment management. Such practices include contour cultivation, crop rotation, stubble retention and reduced tillage practices. These practices aim at reducing erosion by increasing rainfall interception, infiltration and surface detention and also reducing the detrimental effects of accelerated overland runoff.

Soil conservation earthworks such as contour banks and waterways are also used for controlling the velocity of runoff in certain land capability classifications. On land of less than 2% slope strip cropping is used instead of earthworks in order to spread runoff water and prevent it from becoming channelled into flow lines with highly erosive velocities. On such low slope areas earthworks can in fact aggravate an erosion problem.

In all cases, earthworks and strip cropping need to be implemented in conjunction with the appropriate crop management practices, especially conservation tillage. This is critical where the fallow phase of winter crops and the fallow early crop phase of summer crops coincides with the October to March period of high erosivity for the region.

Because most catchments include many landholders, management strategies, soil types and land capability classes an integrated soil conservation management approach is essential. This is being achieved by the implementation of joint schemes with co-operating landholders. This ensures the necessary integration of conservation tillage, strip cropping, earthworks and associated water disposal schemes within a catchment without the artificial constraints of roads, fences and boundaries.