Feedlot Rainfall Runoff Evaluation for Saskatchewan

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Poster

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Proper feedlot planning entails design of adequate storage for rainfall runoff. A frequently used standard for this as been use of the SCS curve number (CN) of 90 for a one in 25 year-24 hr event. Towards improvement of prediction processes controlling feedlot runoff and storage design this model has been extended towards assessment of seasonal accumulation of rain runoff for central and southern Saskatchewan. The primary objective was to evaluate the possibility of a runoff storage pond, designed to accommodate 75 mm of runoff (Saskatchewan design conditions), being filled at any time during the rain season (April thru October). To accomplish the objective, longterm daily evaporative and rain conditions from 27 Saskatchewan climatic stations, were statistically represented and mapped. Runoff was determined using the SCS curve number of 90 for all rainfall events. The runoff was allowed to accumulate in a storage pond, from which direct rainfall addition and removal by evaporation were allowed. Seepage was assumed to be zero. The following climatic and storage pond results were obtained: runoff from a one in 25 year 24 hr storm varied between 40 and 55 mm across the province with no strong spatial trends; October 31 runoff accumulation in storage ponds, from a one in 25 year wet season, ranged from just less than 100 mm in the SW to 150 mm in the east; and the likelihood of a storage pond being full (equal to or greater than 75 mm) by October 31 ranged from once in 33 years in the SW to once in 4 years in the east. If ponds were sized to contain 150 mm of runoff then only one location (out of 27) would exceed October 31 storage more frequently than 1 in 25 years.