CHAPTER X. SOIL BULK DENSITY SAMPLING

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A. SAMPLING METHOD

The method used in this investigation is a volumetric displacement procedure that has been successfully employed in previous experiments. The procedure uses a specially designed bulk density ring with a hook gage and securing bolts. The ring is placed on the ground and secured by driving the bolts into the soil. A plastic film is then placed inside the ring. Water from a graduated cylinder is then used to measure the background volume. After removing the water and plastic, soil is extracted to a specific depth, in this case 5 cm. This soil was placed is plastic cooking bags and sealed. The plastic is then returned to the ring and the total volume is measured using water from the graduated cylinder. The volume of soil extracted is the difference between this volume and the initial background volume (values typically run between 700 and 900 ml). The soil sample is then returned to the lab where a wet weight is obtained. It is then oven dried and weighed again for a dry weight. The bulk density of the soil is computed by dividing the dry weight (less any tare) by the soil volume. The result is in g/cm^3.

B. RESULTS

We attempted to obtain at least two samples from each soil moisture sampling site. In some cases the are no samples, however, it is possible using field observations to use representative values for fields that were not sampled. The field averages are listed in Table X-1. The values appear to be consistent with those we would expect from previous experience. Additional details on individual samples and conditions are available in the field notebooks.

Table X-1. Washita'92 Field Average Bulk Density Data

Site	Bulk Density (g/cm3)	Volumetric Soil Moisture
AG001	1.33	0.158
AG002	1.33	0.180
MS001	1.48	0.163
MS002	1.40	0.473
MS003	1.32	0.156
RG122	1.33	0.146
RG123	1.18	0.375
RG130	1.32	0.145
RG131	1.39	0.171
RG132	1.40	0.205
RG133	1.42	0.180
RG134	1.30	0.082
RG136	1.32	0.105
RG137	1.57	0.086
RG148	1.25	0.246
RG150	1.46	0.275
RG152	1.21	0.306
RG154	1.29	0.183
RL001	1.33	0.151
RL002	1.19	0.183
RL003	1.17	0.376
WS001	0.96	0.229
WS002	1.16	0.167
WW002	1.47	0.273
WW003	1.31	0.145