01

7.8-10113 1.5
CR-156128

Progress Report
HCMM Contract
with the
U.S. Water Conservation Laboratory

1. **Order No.:** S-40255B

2. **Principal Investigator:** Ray D. Jackson
U.S. Water Conservation Laboratory
SEA USDA ARS
4331 East Broadway
Phoenix, Arizona 85040

3. **Period of Report:** 1 NOV 77 to 1 FEB 78

4. **Description:**

a. General.--The site chosen for this research was a 730-acre field near Dunnigan, 35 miles NW of Davis, California. This site was selected for the following reasons:

1. Terrain typical of the major grain-growing areas.

2. Good farmer cooperation.

3. Close to the University of California, Davis, to facilitate cooperation with University personnel and use of facilities.

4. Close to NASA/Ames Research Center where aircraft flights originate.

5. Climate favorable for dryland grain production.

At the end of July a scientist and a technician from the U.S. Water Conservation Laboratory, Phoenix, were temporarily assigned to Davis, California. By mid-August, they had selected 16 sites within the 720-acre field on which ground measurements were to be made. The 16 sites have various slopes and aspects, with slopes ranging from 0 to 36°. Some of the sites constitute a north-south transect and an east-west transect. Surface temperature measurements were made on bare soils beginning 17 October 1977. The field was planted to barley during the period 1 to 7 December 1977. From 8 to 14 December access tubes for the neutron soil moisture meter were installed at all sites and micrometerological instrumentation was installed on the main site (the area with the N-S and E-W transects). The following list shows the instrumentation arrangements, the parameters are recorded on punch paper tape every 20 minutes.

HCM-005

(E78-10113) [HEAT CAPACITY MAPPING MISSION GROUND MEASUREMENTS] Progress Report, 1 Nov. 1977 - 1 Feb. 1978 (Agricultural Research Service) 4 p HC A02/MF A01 CSCL 08H G3/43 00113 Unclas

N78-21518

Parameter	SITE							
	R1	T1	W1	B1	E1	S1	B2	N1
Incoming solar radiation	X	X					X	
Reflected solar radiation	X	X	X	X	X	X	X	X
Net radiation	X	X	X	X	X	X	X	X
Wind speed and direction	X	X					X	
Air temperature @ 150 cm	X	X	X	X	X	X	X	X
Soil temperature @ surface	X	X	X	X	X	X	X	X
Soil temperature @ 2 cm	X	X	X	X	X	X	X	X
Soil temperature @ 4 cm	X	X	X	X	X	X	X	X

In addition to these data taken automatically, the following measurements are made manually at all 16 sites:

Parameter	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Surface temperature w/infrared radiometer, presunrise and @ 1230 - 1300 hr	X	X	X	X	X	X	X
Soil moisture w/neutron meter every 20-cm depth to 160 cm		X		X		X	
Ten plant samples from each site for height, dry weight, green leaf area, and growth stage		X			X		
Soil temperature w/thermistor probe @ 2- and 4-cm depth at sites R2 through R9	X	X	X	X	X	X	X
Albedo at sites R2 through R9 w/portable unit on clear days							
Reflected radiation w/Exotech 4-band radiometer on clear days							
Insect sweeps and pathogen identification			X				
From weather station @ site; maximum-minimum temperatures and evaporation pan (also, weekly record from hygrothermograph).	X	X	X	X	X	X	X
Raingages at all 16 sites as appropriate							
NASA aircraft at 1.4 km to measure surface temperature @ presunrise and @ 1300 hrs			X			X	

b. Problems.--The major problem to date has been the weather. The site went from extreme drought to extreme wet within days. The November-December rainfall was 169 mm (6.7 inches). Rain causes problems of getting to the site and making measurements once there. Actually, very few days of ground data were missed. Aircraft flights were severely limited because of the weather. Relatively few clear days have occurred since the experiment began. U-2 flights are not scheduled until May. Except for the weather, the experiment is going well. Slippage of the launch date of the PCMM would cause loss of data for this year's crop.

c. Accomplishments.--The major accomplishment was getting the experiment under way. Data acquisition and analysis have not progressed to the point that accomplishments can be identified.

d. Significant results.--None as yet.

e. Publications.--None as yet.

f. Recommendations.--None.

g. Funds expended.--$19,912

h. Data utility.--No spacecraft data available.

Submitted by

Ray D. Jackson
Principal Investigator