

**Addendum to
National Airborne Field Experiment 2005
Workplan**

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1 Overview

This document is intended to update the NAFE'05 workplan with the changes in sampling procedures and ground infrastructure that resulted from the NAFE'05 field campaign in November 2005. Those aspects not mentioned here are to be assumed unchanged from the original workplan.

1.1 Spatial soil moisture sampling

1.1.1 Regional scale

Regional sampling resolution was changed to 2km. (see Fig.1) due to time restriction. Sampling protocols which were changed are highlighted in bold in table 1.

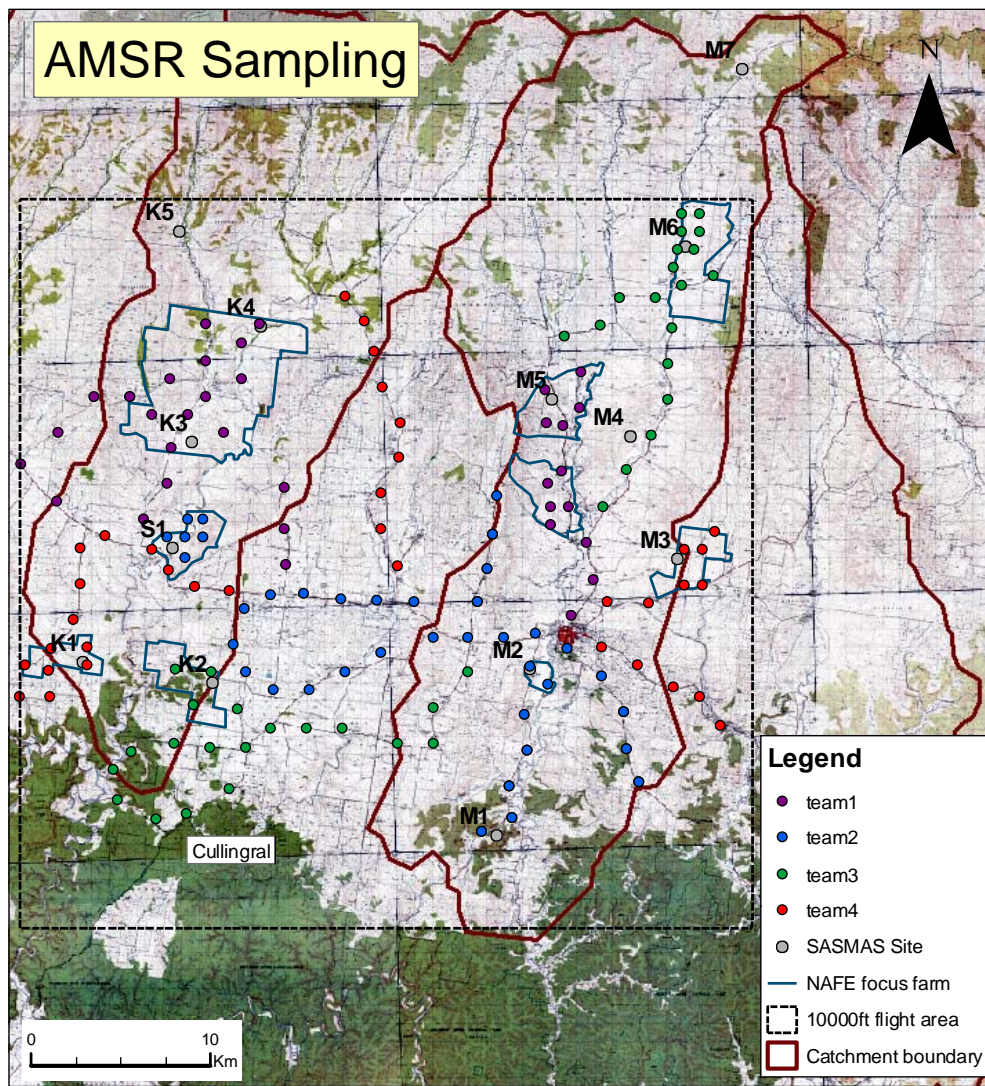


Figure 1. Sampling locations for regional scale soil moisture monitoring

Table 1. Data collected during regional sampling days

Regional sampling				
<u>Measurements</u>	<u>Extent</u>	<u>Spacing</u>	<u>N. of Samples</u>	<u>Comments</u>
Vegetation biomass samples (quadrant type)	High resolution areas	50m	16 p/farm	Week 1&3
Vegetation biomass samples (quadrant type)	High resolution areas	High resolution areas corners	4 p/farm	Week 2&4
Vegetation height	NOT RECORDED			
Soil moisture (hydra probe)	Regional	2 km		
Gravimetric soil samples	Regional;		10	Every week
Vegetation biomass samples (quadrant type)	Farm	-	6 or less p/farm	Every week
Vegetation type	Regional	2km	-	Week 1&2
Landuse	Regional	2km	-	Week 1&2
Surface roughness	Farm		>4 p/farm	Once, rotated
Surface rock cover	Regional	1km	-	Only Week 2
LAI (Jose Fenollar)	High-resolution areas	High resolution areas corners	-	Once, rotated
NDVI (Jose Fenollar)	High resolution areas	50m	-	Once, rotated

1.1.2 Focus farm sampling

Focus farm sampling strategy was changed after the first day of campaign because the original plans were found to be not feasible within the time available daily. The original 4 teams were merged into two groups, each one dedicated to one single farm for the whole day. Each group on each farm was subdivided into 3 teams.

1. One team sampling the high resolution area
2. One team sampling at intermediate resolution
3. One team sampling the coarse scale points

Farm scale sampling schedule varied from Week to week due to various constraints, and it's summarized in table 2.

Soil moisture sampling grid at farm scale were changed in order to have a reduced number of sampling points. Full farm coverage was sometimes not guaranteed due to accessibility issues, while sampling at various spatial scales was preserved as in the original plans. The actual sampling plans are displayed in Fig. 2 and 3 at the end of this document.

Table 2. NAFE'05 ground sampling calendar

DATE	KRUI AREA				MERRIWA AREA			
	Pembroke	Stanley	Roscom.	Illogan	Dales	Midlothian	MerriwaP.	Cullingral
31/10/05	REGIONAL							
1/11/05								
2/11/05								
3/11/05								
4/11/05								
7/11/05	REGIONAL							
8/11/05								
9/11/05								
10/11/05								
11/11/05								
14/11/05	REGIONAL							
15/11/05								
16/11/05								
17/11/05								
18/11/05								
21/11/05	REGIONAL							
22/11/05								
23/11/05								
24/11/05								
25/11/05								

Sampling protocols during farm scale sampling days were also subjected to minor changes which are highlighted in bold in Table 3.

Table 3. Data collected during farm scale sampling days

Farm scale sampling: Roscommon (Krui days), Dales (Merriwa days)

<u>Measurement</u>	<u>Extent</u>	<u>Spacing</u>	<u>N. of Samples</u>	<u>Comments</u>
Soil moisture (hydra probe)	High resolution grid /FL	12.5/6.25m		morning
Soil moisture (hydra probe)	Farm scale/FL	1km/500m/ 250m/125m 62.5m		afternoon
Vegetation water content samples (grab type)	High resolution areas	High resolution area corners -	2	End of day
Dew vegetation samples	Farm scale/FL	-	2	On dew flight days (early morning)
Gravimetric soil samples	High resolution area	High resolution area corners-	4	Every day
Vegetation type	Farm scale	500/250/12 5m		Week 1&2
Dew visual observation	Farm scale	-		Until dry

1.1.3 High resolution areas

The position of some high resolution areas was changed after a pre-campaign survey, mainly because of changes in the farm cropping plans. This determined a change in the type of vegetation cover for some high resolution areas, which is summarized in table 4.

1.2 Supporting data

In this section the changes done on sampling protocols for supporting data are briefly justified

1.2.1 Thermogravimetric soil moisture samples

All thermogravimetric samples were taken concurrently with a Stevens Water Hydra probe[®] reading and a Theta probe[®] reading at the same location, to ensure calibration for both devices

- On regional sampling days, 10 gravimetric samples were taken across the region, instead of on the individual farm, to ensure a wide range of soil type and wetness conditions were covered
- 'On farm scale sampling days, the number of gravimetric samples was elevated from 2 to 4, and all samples were taken at the 4 corners of the high resolution areas, to provide site specific calibration of the probes

Table 4. Changes in high resolution areas locations and features

Farm	topography	vegetation cover	Centre point Lat (Deg)	Centre point Long (Deg)	Changes
Pembroke	gently sloping/ contour bank	Native grass(20%)/ Barley(80%)	150.1412	-32.0406	moved
Stanley	sloping south	Native	150.1380	-32.0936	moved
Roscommon	flat	Native	150.1469	-32.1747	
Illogan	flat	Oats(60%)/ Barley(40%)	150.0669	-32.1402	moved/different vegetation cover
Dales	sloping/creek	Native	150.4324	-31.9496	
Midlothian	flat	Fallow (50%)/ Lucerne (50%)	150.3624	-32.0204	moved/different vegetation cover
Merriwa Park	gently sloping	Wheat	150.4318	-32.0981	moved
Cullingral	flat	Wheat(50%)/Ba rley(50%)	150.3412	-32.1621	different vegetation cover

Table 5. Monitoring stations data collected during NAFE'05

Station	Thermal infrared	Leaf wetness	Temperature profile
Midlothian	31 oct - 17 nov	31 oct - 20 nov	31 oct - 20 nov
Stanley	17 nov - 25 nov	31 oct - 25 nov	31 oct - 25 nov
Merriwa Park	31 oct - 27 nov	31 Oct - 27 Nov	31 oct - 27 nov
Illogan	31 oct - 27 nov		31 Oct - 27 nov
Dales		31 oct - 9 nov	31 oct - 9 nov
Pembroke		1 nov - 27 nov	1 nov - 27 nov
Roscommon			31 oct - 16 nov
Cullingral		21 nov - 27 nov	21 nov - 27 nov

1.2.2 *Vegetation Biomass and water content*

- On regional sampling days, 16 high resolution vegetation biomass samples were taken on week 1 and week 3. On week 2 and week 4, these data were integrated with 4 vegetation biomass samples at the 4 corners of the high resolution areas.
- On farm scale sampling days, the 2 water content samples of reference vegetation were decided to be defined as the 2 opposite corners (A12 and M0) of the high resolution areas

1.2.3 *Vegetation height*

Not recorded or only partially

1.2.4 *Vegetation type and land use*

A decision was made to back up these observation in week 2, to compensate for lacks in week1 data.

1.2.5 *Surface rock cover*

It was recorded once during the campaign at regional scale. Furthermore, at Stanley farm it was recorded at higher resolution (62.5m and 125m) once.

1.3 **Monitoring stations**

Original plans for monitoring stations were subjected to minor changes due to incidental circumstances (e.g. change of grazing plans). Table 5 summarizes the data available at each monitoring stations and the period of data collection.

1.4 **Flight plans**

Flight plans outlined in the original workplan suffered some changes, mainly concerned with the multi-angle segment of the experiment. Changes were due to availability of the ancillary

sensors (NDVI scanner and digital camera) and the need for coordination with the parallel EMIRAD experiment flights. Below is a list of the modifications to the original flight plans (please refer to page 50 of NAFE'05 workplan for the original schedule).

- 31/10 – landed to restart loggers
- 2/11 – NDVI and photos taken
- 9/11 – multiangle for Merriwa Park /w dives
- 11/11 – multiangle for Midlothian /w dives
- 15/11 – water cal shortly following EMIRAD
- 16/11 – multiangle for Merriwa Park /w dives
- 17/11 – half thermal imager data missing
- 18/11 – multiangle for Cullingral /w dives
- 21/11 – coincident with EMIRAD survey
- 23/11 – multiangle for Merriwa Park /w dives plus partial “potato” flight
- 25/11 – dew flight with rain; overflow burning mountain

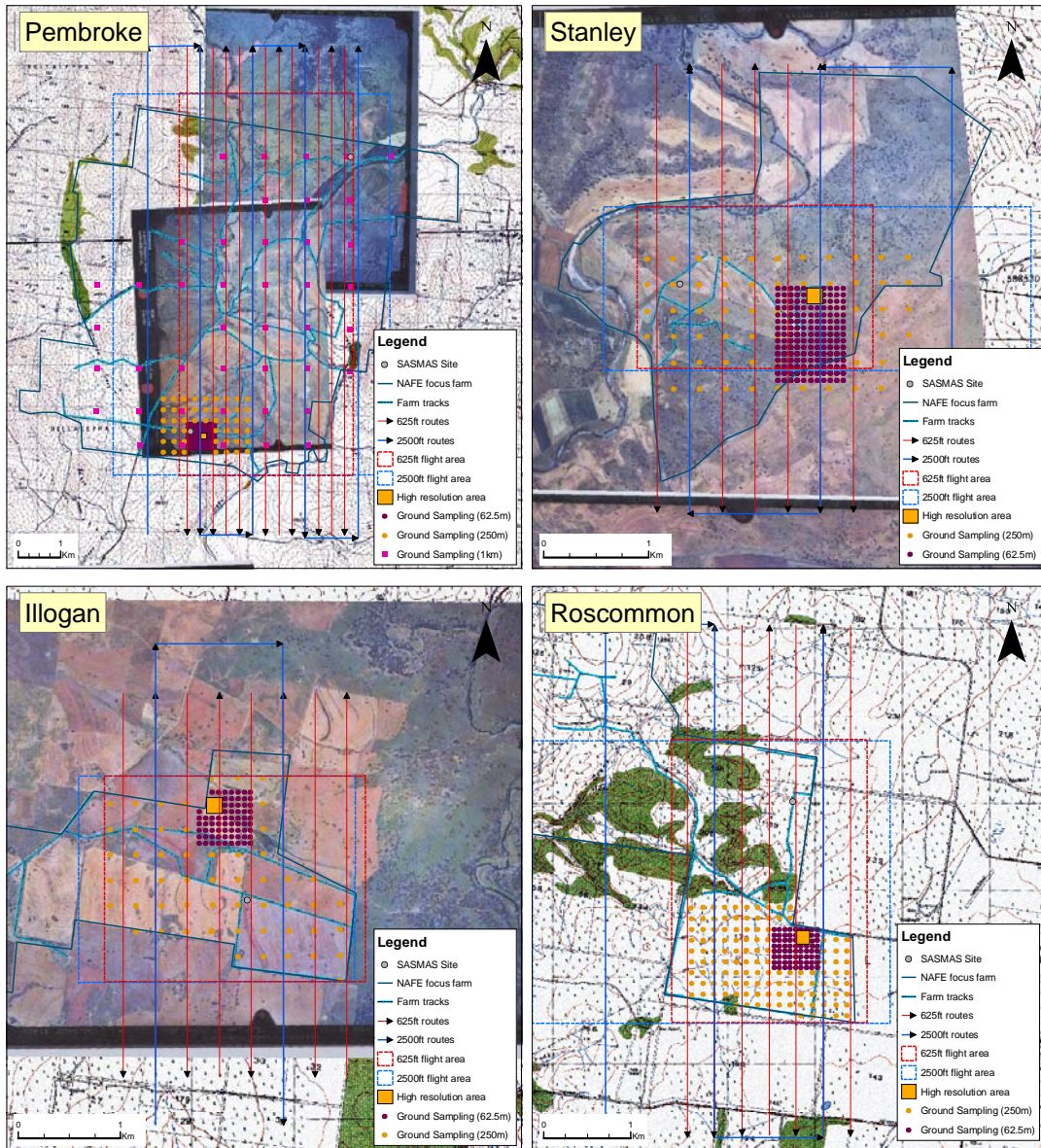


Figure 2. Soil moisture sampling grids during NAFE'05 – Krui area

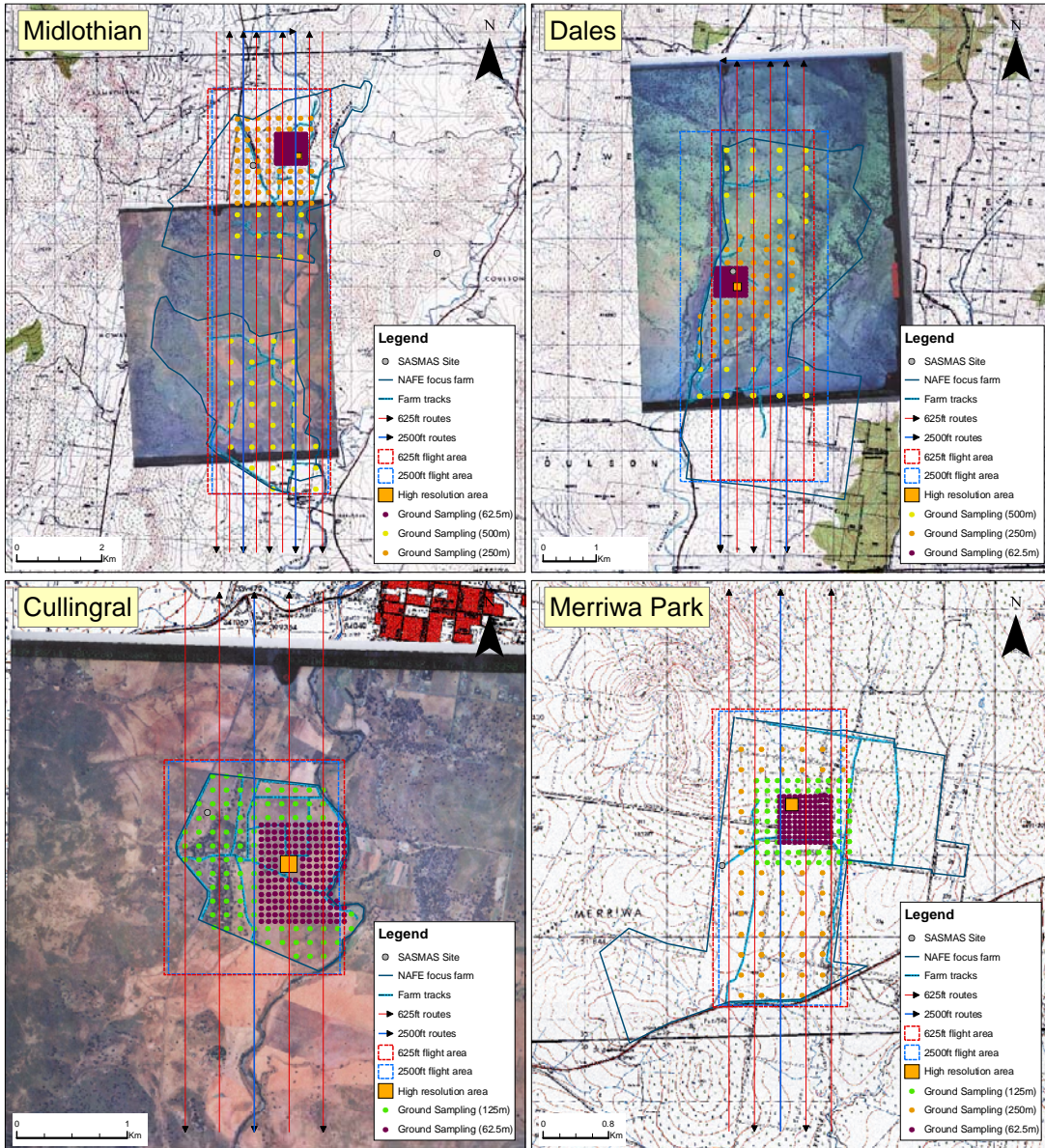


Figure 3. Soil moisture sampling grids during NAFE'05 – Merriwa Area