Agricultural Production Monitoring
Break-out Session – February 11, 2009

Preamble:

- RS system needed for crop classification and yield estimation (focus on what is being currently used)
- Did not include meteorological systems

General Comments:

- Many of systems currently available are adequate for crop condition assessment, but many do not have spatial resolutions needed for field-level crop identification
- Need to keep in mind that users are interested in value-added products such as FAPAR, not reflectance/backscatter data
- need to use 2 resolutions together – level 1 – ag vs non-agr (could use coarser resolution)
- level 2 – crop specific (higher resolution)
- also need agronomic parameters, not only spectral information, in order to achieve good accuracies on crop information/classification

Level of Usage:
R=regional (sub-national)
C=country
G=global

Application
A = Crop Area
Y = Yield

Y = Yes, meets requirements
L = There are limitations

System	Level of Usage	Crop area (type) or yield	Coverage (swath)	Timeliness (revisit)	Spatial	Spectral	Accessible
MODIS	G, C	A(G) Y (G,C)	Y	Y	Y	Y	Y
CBRES - Wide swath (SWI) - Narrow swath (CCD)	C, R R	A (R) A(R)	800km (Y) 100km (L)	5 days (Y) 26 days(L)	258m(Y) 20 m (Y)	L (only 2 bands) L (only 4 bands)	L (not easily accessible for entire globe)
MERIS	G,C	A(G) Y (G,C)	Y	Y	Y	L (15 bands but all in same spectral region)	L (can be difficult to access due to timeliness of delivery of data–is a science mission
Indian RS - AWiFS - LISS	C, R R	A and Y A and Y	720km(Y) L	5 day (Y) L	56 m (Y) Y	Y Y	L (commercial – data cost; must be programmed)
SPOT VGT	G,C	A (G) Y (C)	Y	Y	Y (G) L (C)	Y (has SWIR)	L (commercial – cost for immediate access)
NOAA AVHRR	G,C	A (G) Y (C)	Y	Y	Y (G) L (C)	L	Y
IKONOS	R (on sample basis)	A	L (sample only)	L	Y	L	L (must be programmed, cost)
METOP AVHRR	G,C	A (G) Y (C)	Y	Y	Y (G) L (C)	L	Y
Landsat ETM (in particular archive)	R	A and Y	L	L	Y	Y	L

System	Level of Usage	Crop area (type) or yield	Coverage (swath)	Timeliness (revisit)	Spatial	Spectral	Accessible
DMC – Beijing-1	Same as AWiFS				32 m (Y)		
QuickBird	R (on sample basis)	A	L (sample only)	L	Y	L	L (must be programmed, cost)
RADARSAT-1	C, R	A	Y ScanSAR or Wide Swath for C; Standard for R	Y for crop id. L for crop condition with 24-day exact repeat	Y	L (one polarization)	L (cost)
RADARSAT-2	C, R	A	Y ScanSAR or Wide Swath for C; Standard for R	Y and Left and R looking improves revisit	Y	Y (quad-pol)	L (cost)
Envisat ASAR	C, R	A	Y	L (35-day repeat)	Y	L (2 polarizations only)	L (experimental; not operational access)
ALOS PALSAR	C, R	A	Y	L (46 day repeat)	Y	Y	L (difficult to access; fixed configuration and coverage schedules)
INSAT - AVHRR - CCD	Similar to SPOT VGT					CCD (narrow bands)	

	(CCD); AVHRR similar to NOAA						

- coverage and temporal repeat is limited for sensors in the less than 30 m resolution range and in particular for very high resolution satellites (< 5 m)
- revisit for SAR is limited if need to have exact repeat angle (important for crop condition; more tolerance for crop area)
- spectral characteristics are limited for many sensors (many do not have SWIR – less important for crop area; but can be of value for yield)
- SAR with only 1 or 2 polarizations are limiting
- **Almost all sensors are limited in accessibility**
    - Cost of data (many are commercial)
    - Acquisitions must be programmed
    - Some systems are science/experimental and do not deliver operational service
    - Timely delivery of data can be an issue