TITLE:

Remote Sensing at AG-CARES, Lamesa, TX, 2003.

AUTHOR:

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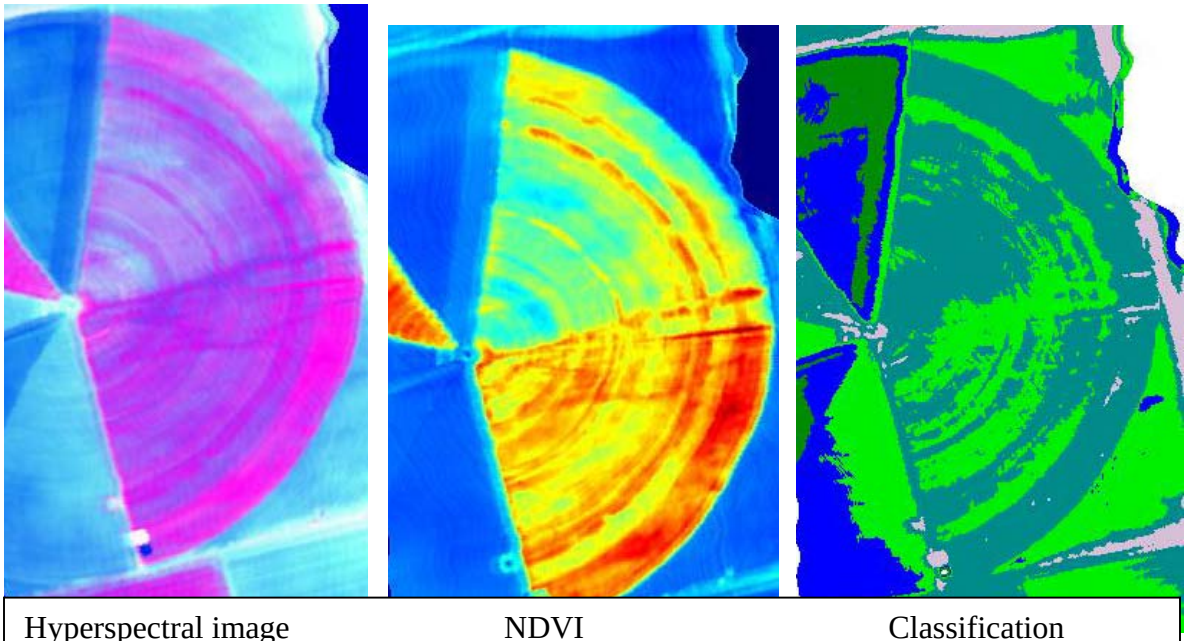
MATERIAL AND METHODS:

Dates of flights for hyperspectral imagery:	March 6, July 1, July 16, July 31, and Sept. 9.
Dates of flights for aerial photographs:	July 11, Sept. 16.

RESLTS AND DISCUSSION:

March 6: (Figure 1)



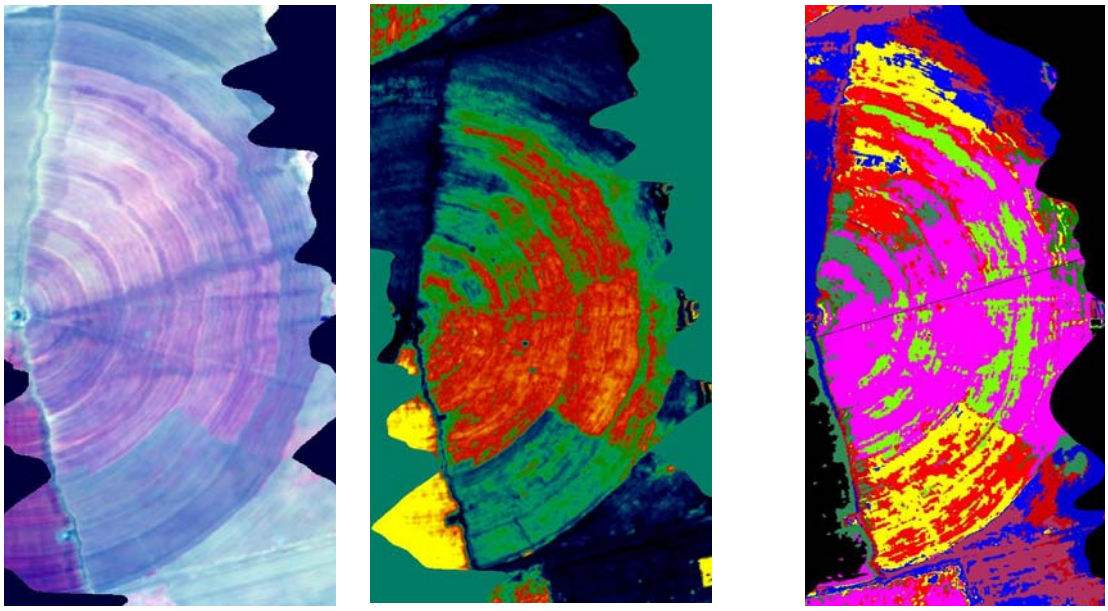
Hyperspectral image NDVI Classification

The hyperspectral image shows sharp details about differences in the growth of the wheat cover crop. The brighter red is the best growth in the NDVI. The north and south wedges appear to be bare soil with little variation in the hyperspectral image and NDVI index. The NDVI is an indication of wheat biomass. The classification image represents another way to look at the imagery. It has the least amount of differences (only two colors) for the eastern part of the circle. However, it shows more differences for the bare soil wedges than the hyperspectral image or NDVI.

The next image was taken on July 1. The original planting was on May 5th, but part of the field was hailed out and was replanted. In the precision agriculture area, the outer spans at the south end of the circle were replanted. The replanted cotton areas were clearly distinguished in the hyperspectral image and SAM classification image (Fig. 2). The hyperspectral image gave the

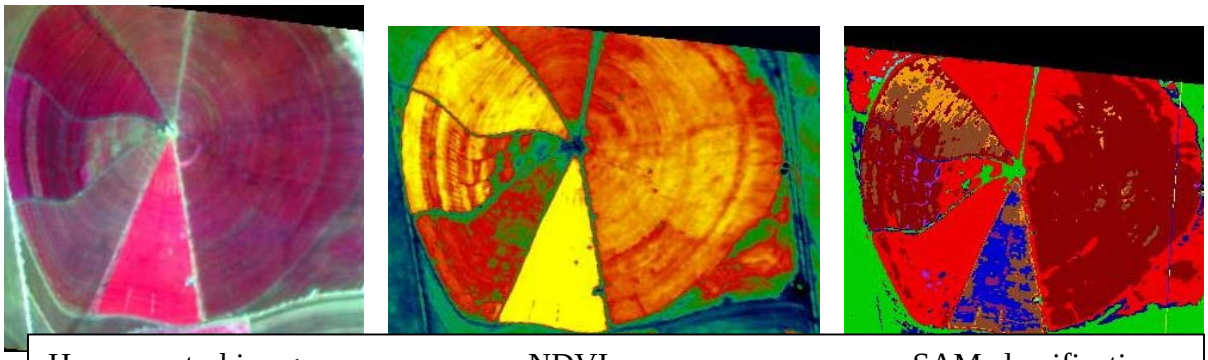
best indication of the soil moisture drainage towards the center of the field (Fig. 2). The NDVI indicated the biomass of the replant cotton and cotton on the north end of the field was poorer (blue (poorest), green (better),) than the cotton in the center (red = good growth, yellow = best growth).

July 1: Figure 2



Hyperspectral image	NDVI	SAM classification

July 16: Figure 3.

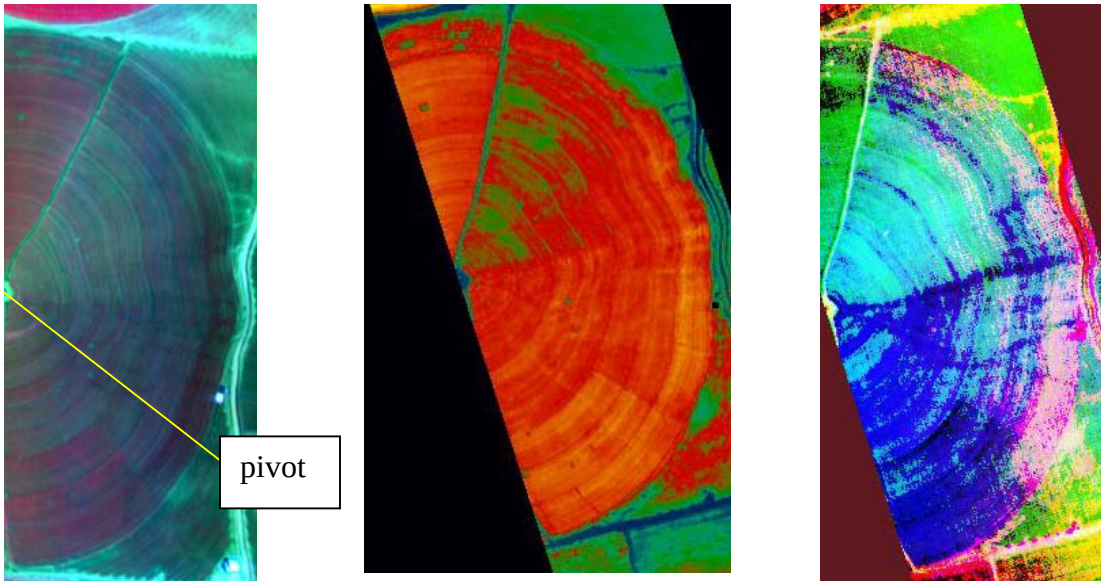


Hyperspectral image	NDVI	SAM classification

The east side of the circle appears to be relatively uniform on July 16. The replant cotton caught up with the original planted cotton. The south wedge (peanuts) appeared uniform in the hyperspectral image and NDVI. However, the SAM classification does distinguish areas that differ (blue vs. brown color in this wedge). The wedge on the west side of the field at 270 degrees shows striping in the hyperspectral image and a lot of variation in the NDVI due to different varieties, but little differences in the SAM classification., while the wedge immediately north (315 degrees) shows much more variation in the SAM classification than the other pictures.

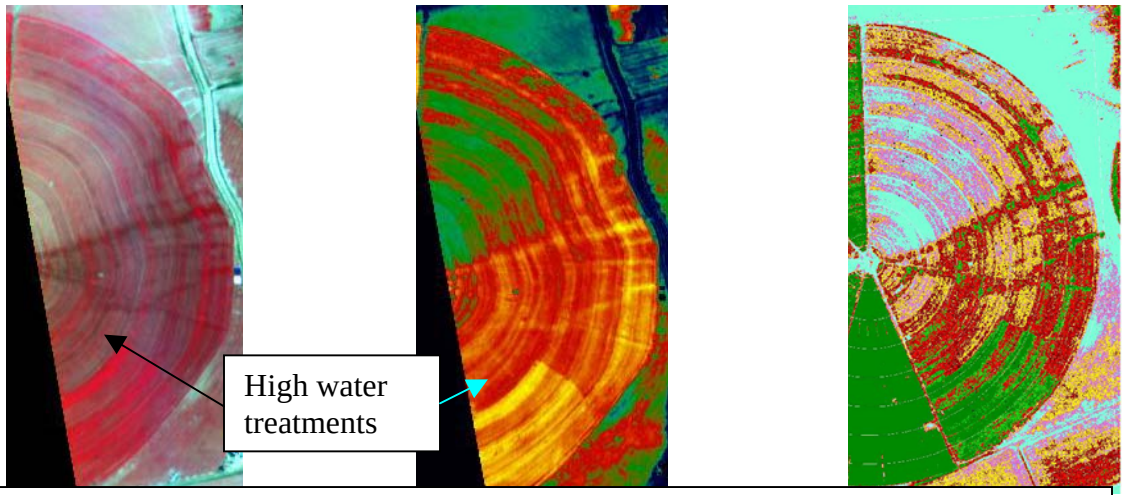
The image taken on July 31 (Fig. 4). had the pivot running in the southeast part (yellow line on hyperspectral image). However the hyperspectral and NDVI show little affect of the pivot running, while the MNF transformation shows the irrigation clearly (colored dark blue). The NDVI indicates more vigorous biomass (colored yellow) in the replant cotton than the original cotton, and the area colored green in the north part of the test has the poorest biomass.

July 31: Figure 4.



Hyperspectral image NDVI MNF transformation

Sept. 9: Figure 5.



Hyperspectral image NDVI Classification

On September 9 (Fig. 5), the replant cotton and irrigation treatments show clearly in both the image and NDVI. The classification image was actual taken from an infrared color photograph. It distinguished many more groupings than classifying the hyperspectral image. The color groupings appear to be related to replant vs. original planting, soil moisture, and other soil properties more than to yield or biomass.