AAAID Applying Precision Farming Technology In Agadi Project – Sudan

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AAAID:

- was established on the first of November 1976 with 19 shareholders of the Arab countries.
- The main office in Khartoum.
- The regional office in Dubai
- Activities included investment in all form of agricultural production and related activities.
- Web site: www.aaaaid.org
Agadi project:

It is located in one of the AAAID’s agricultural investment activities.

Location: 35 km west of Damazine, Blue Nile state, 570 km southeast of Khartoum.
Soil: Vertisols
Rain: 500 – 700 mm from July to October
Farming System: zero-tillage of heavy machinery movement.

Crops: Cotton, Sorghum, Sunflower maize and Sesame.
Precision Farming:

Is an approach to manage crops and land selectively according to their need.

It is a site-specific management or variable application rate technology.

It utilizes the latest information technology.

It integrates tools and techniques, convert them into usable knowledge.
Precision Farming:

Enable farmers to get better understanding and control their fields to make the right decision particularly when there is a great variability within the field.

PF utilizes the information technology such as GPS, GIS, aerial photography, satellite images and sensors technology.
GPS:

24 satellites
Components of PF

GPS:

24 satellites
orbiting the earth twice a day transmit precise time and position (latitude, longitude and altitude).

5 ground stations
to monitor these satellites provide 24-hours a day

The user can determine his location anywhere on Earth.
Components of PF

GIS

**Hardware:**
- Computers, Scanner, plotter, Microprocessor

**Software:**
- **SMS**: Spatial management system
- **Arc View**: Data management, processing, analysis.
- **Surfer**: Contouring and 3D modeling.
- **TGO**: Trimble Geometrics Office (for GPS data processing).
Out-comes of the PF:

Phase 1

Base map

Contours, roads, camps, water sources, tree lines, buildings, rain/moisture stations and base station (farm layout).

Used for farm management, planning and decision making support.
Base station
GPS Antennae

Radio Antennae

Rover

Data logger

Survey data collection
Digital Terrain Model (3D Map)

Plate 2
Digital Terrain Model
For Agadi Pilot Farm

Legend
- Natural drainage line
- Red road
- Block boundary
- Camp

Elevation (m)
- 24
- 25
- 34
- 35
- 44
- 45
- 56
- 66
- 76
- 83

Area 20 000 fedan
Outcomes of the PF:

Phase 1

Controlled traffic lines

Straight lines (using GPS)
controlled traffic

- Straight line
- All implements follow the same track (Reduces Soil compaction)
- Agricultural operation can be performed at night (reduces time)
- Reduces machinery cost, input cost, drivers fatigue
- Enhance crop stand.
Agadi project from spray plane
(guided by GPS system, no flags)
Two systems:
- Self steering guidance system (Fully automatic)
- Light bar guidance system (Partially automatic)
Straight lines, using marker, self steering system
PLANTING WI TH LIGHTBAR SYSTEM

GPS antennae

Light bar

Light key
Light bar, guiding system
Out-comes of the PF:

Phase 1

Data loggers
microprocessors (Agleader technology), sensors (speed, height, moisture, grain, cotton).

Used to register farm data and to be processed using PC.
Farm records

Log GPS data and Yield data
Outcomes of the PF:

Phase 1

Yield data

Determine the yield of each specific area (square meter) using RTK GPS and yield sensors.

produce map shows yield variation of the farm.
Cotton Stripper

Cotton Picker
Problematic area

Yield map

Grower: ASBNAICO
Farm: Aga
Year: 2003
Operation: Grain Harvest
Crop/Product: SORGHUM
Area: 203.91 ha
Est. Yield Mass (Dry): 1.097 tonnes/ha
Avg. Moisture: 13.23 %
Benefits gained from pf this season 2003:

- Time for planting operation reduced 50%.
- Improve in plant cover 3.5%.-No markers.
- Fewer breakages of planters.
- Saving money on fallow spraying herbicides- No Overlapping ($24,122US).
Phase 2:

1- Monitoring crop during the growth stages (Aerial photography, satellite images)

2- Variable application rate.
Automatic soil sampler
THANK YOU

The president of AAAID