



COMUNE DI FIRENZE

Consiglio di Quartiere 4

Assessorato alla Partecipazione Democratica,  
ai Rapporti con i Quartieri, Nuovi Stili di Vita e Consumo Critico

In collaborazione con ARSIA  
e Laboratorio congiunto Università Impresa GEMMA VERDE

# Macchine per la manutenzione del verde

Firenze 7 - 8 maggio 2009

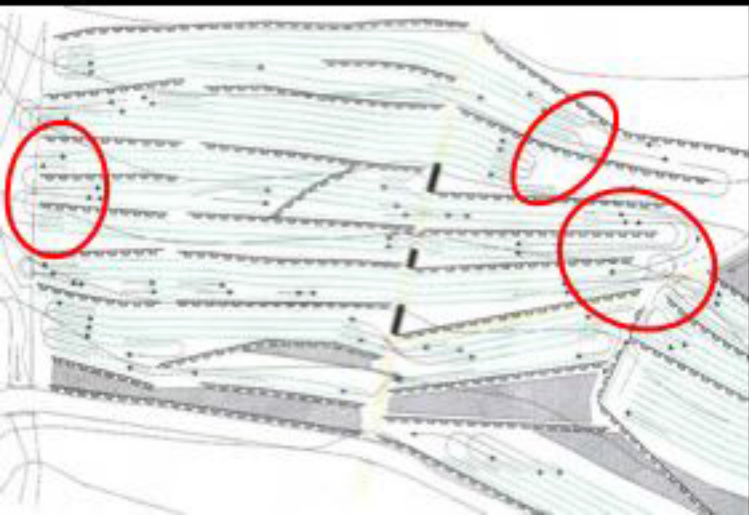
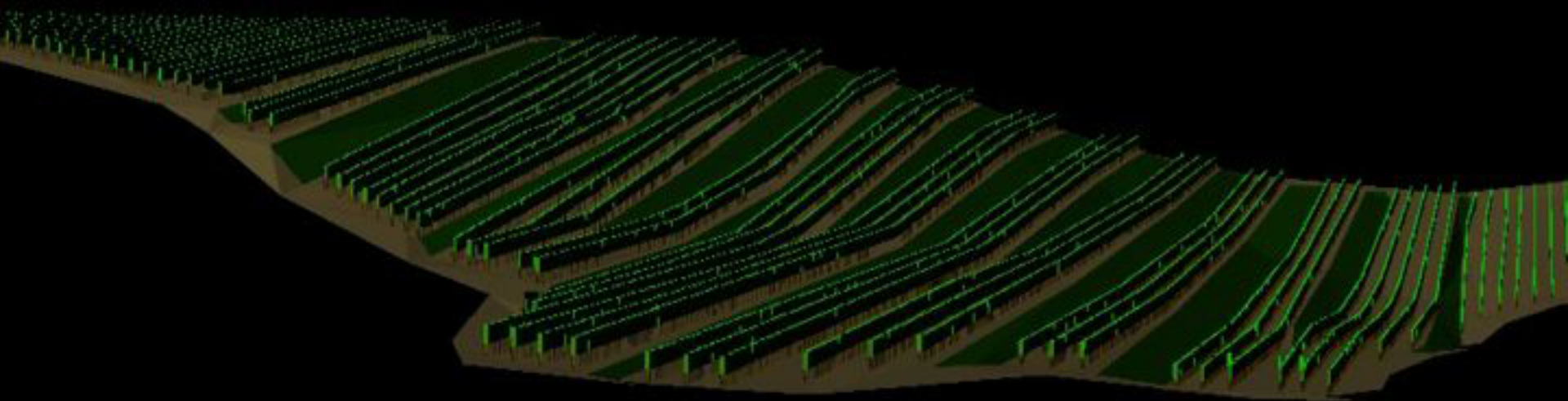
Limonaia di Villa Strozzi - Via Pisana, 77

Con il contributo di:



Atti pubblicati da







# Macchine per la manutenzione del verde

## Limonaia di Villa Strozzi

Firenze 7-8 Maggio 2009



COMUNE DI FIRENZE



Tecnologie di identificazione, georeferenziazione  
e vettorializzazione degli elementi del verde:  
*dispositivi GPS-RFID, Machine Automation*



Adolfo Deltodesco, Emilio Palchetti, Marco Vieri



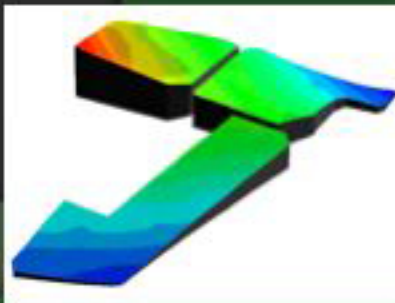
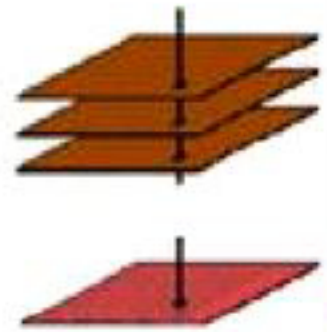
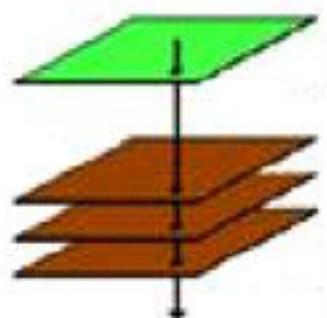
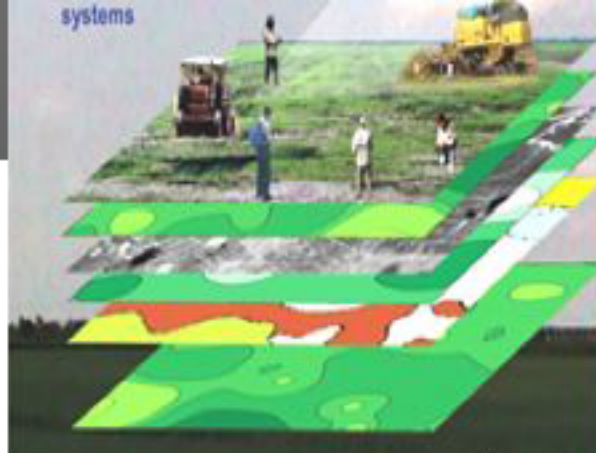
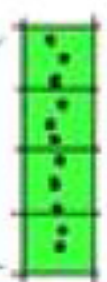
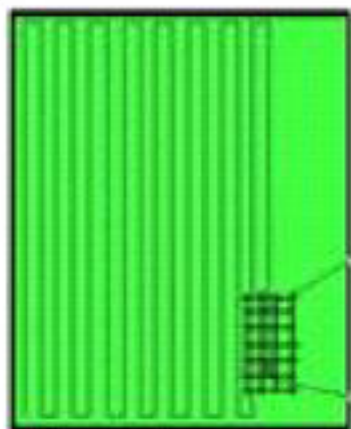
DIAF - Dipartimento di ingegneria agraria e forestale - Università di Firenze  
Leicageosystem Divisione Machine Automation - Calenzano (FI)

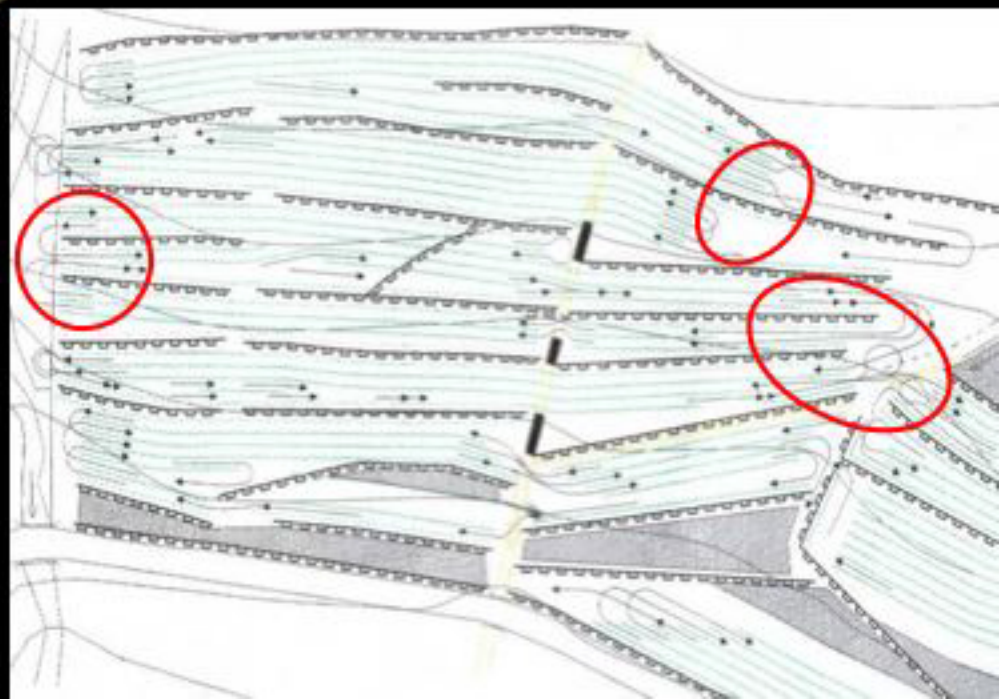
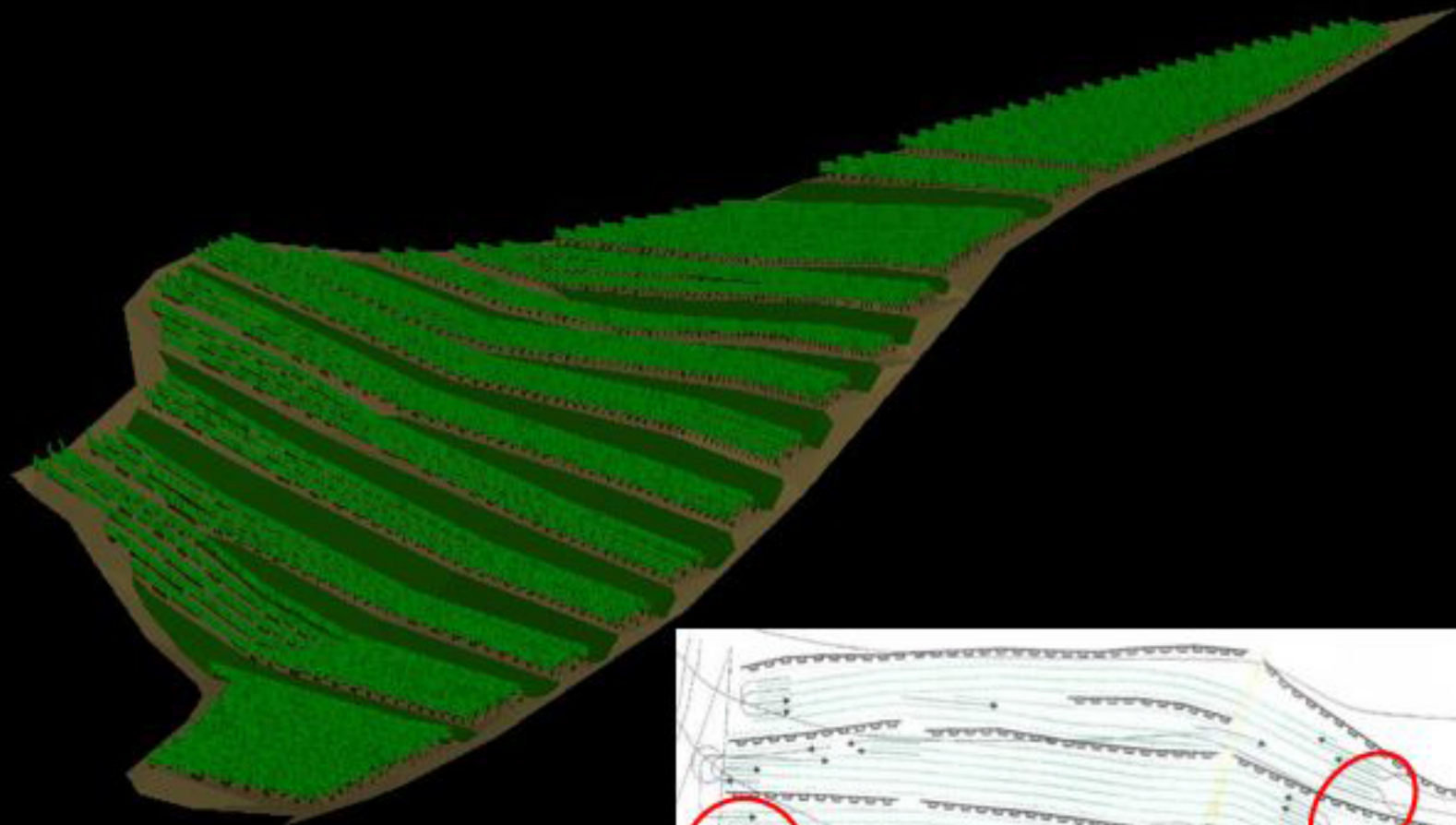


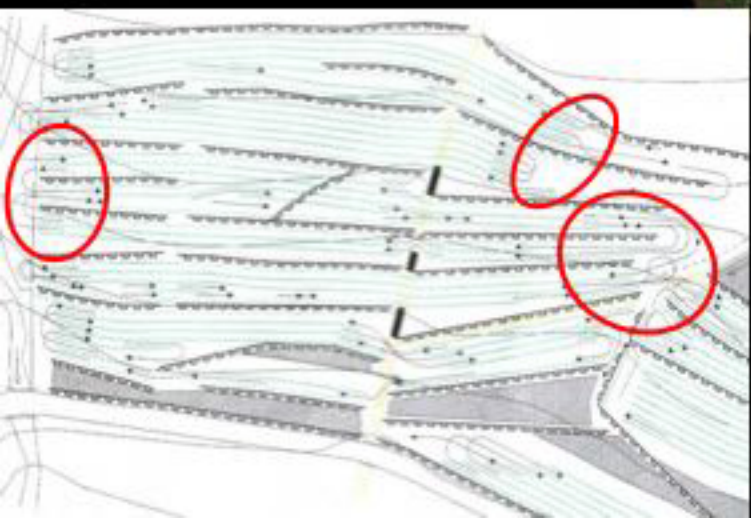
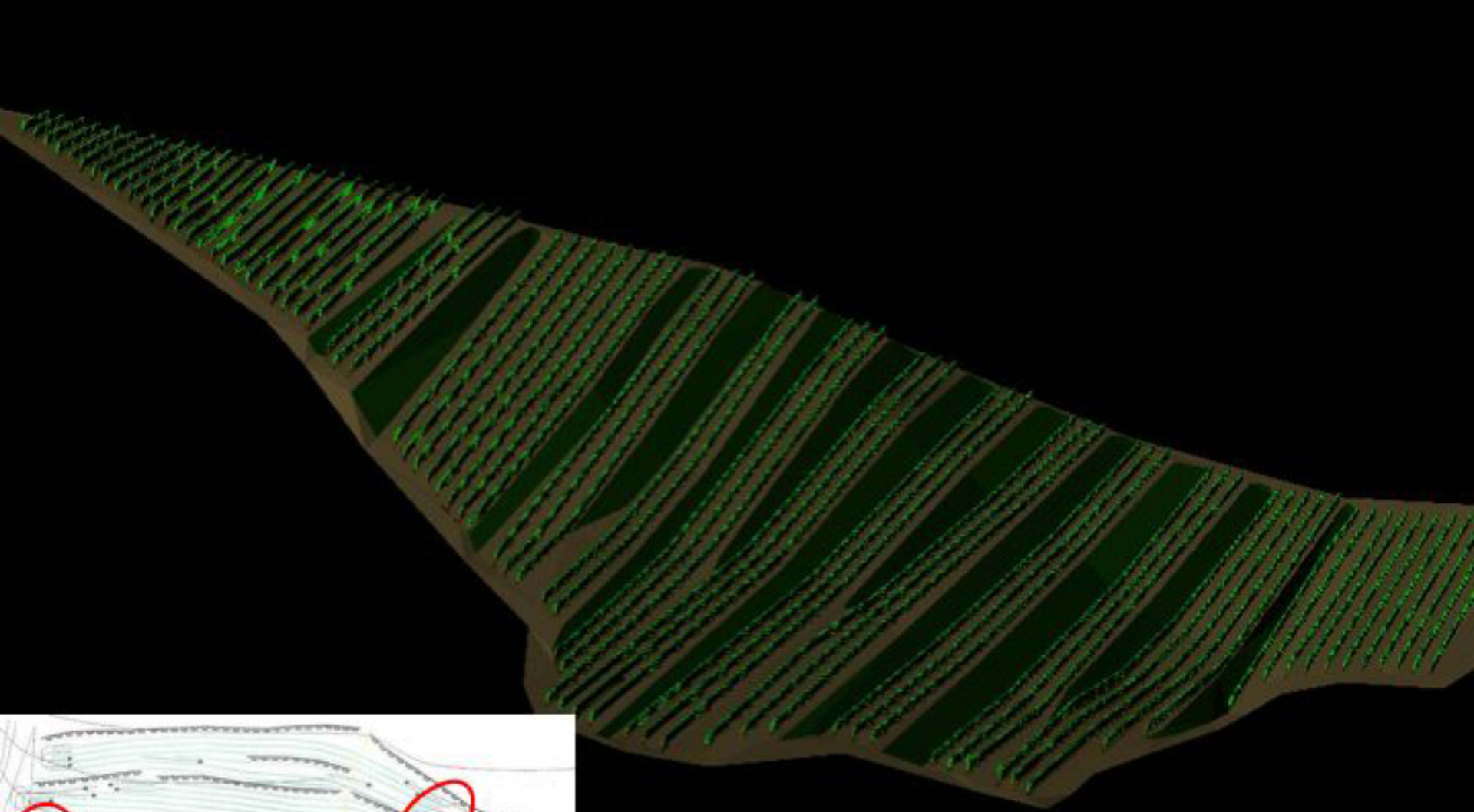
Tag Italia RFID Systems & Technology

# Agricoltura di precisione

systems



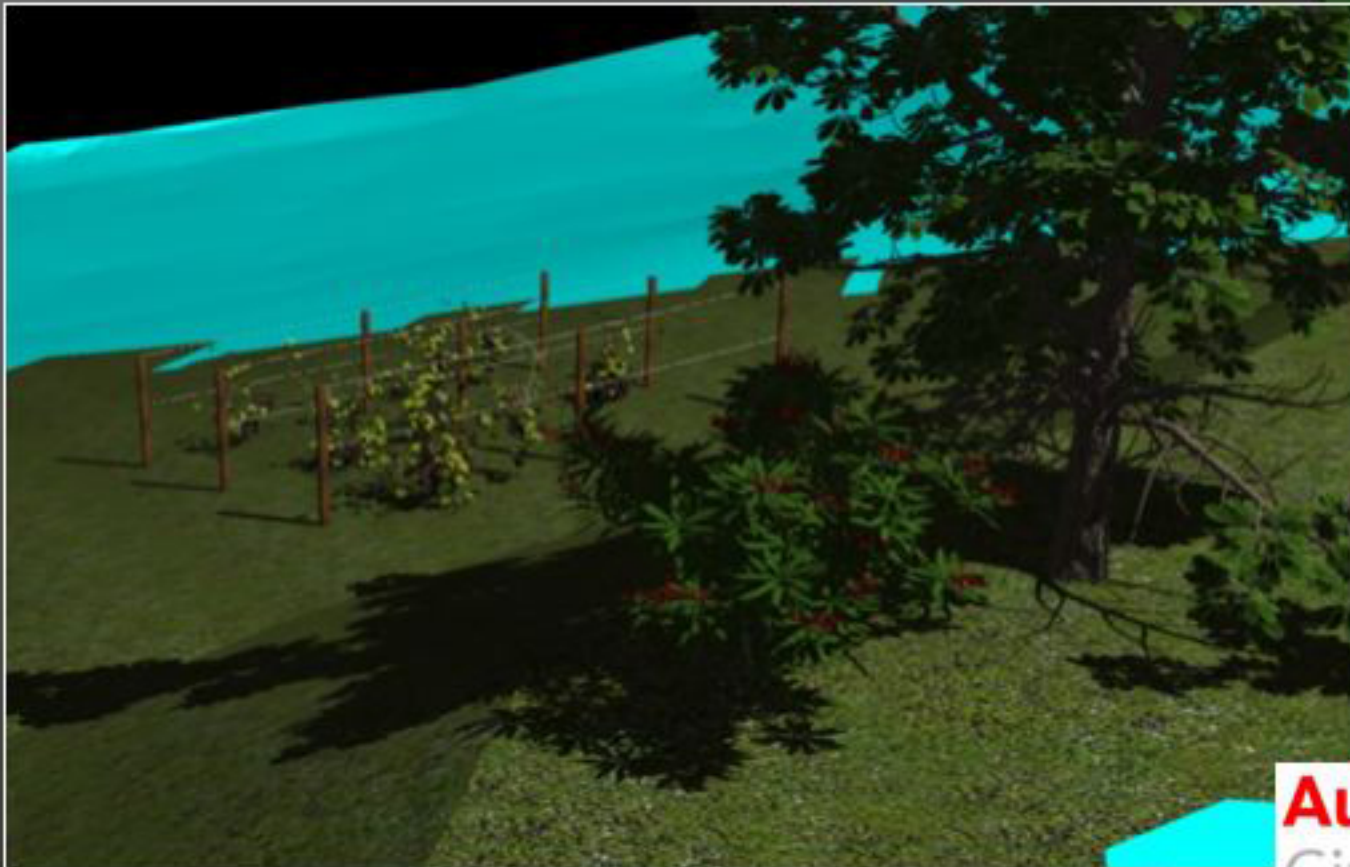




# SOFTWARE DEDICATI

## AUTOCAD CIVIL 3D- vantaggi

Possibilità di rendering



**AutoCAD**  
Civil 3D

# CASI STUDIO

## Campo da golf

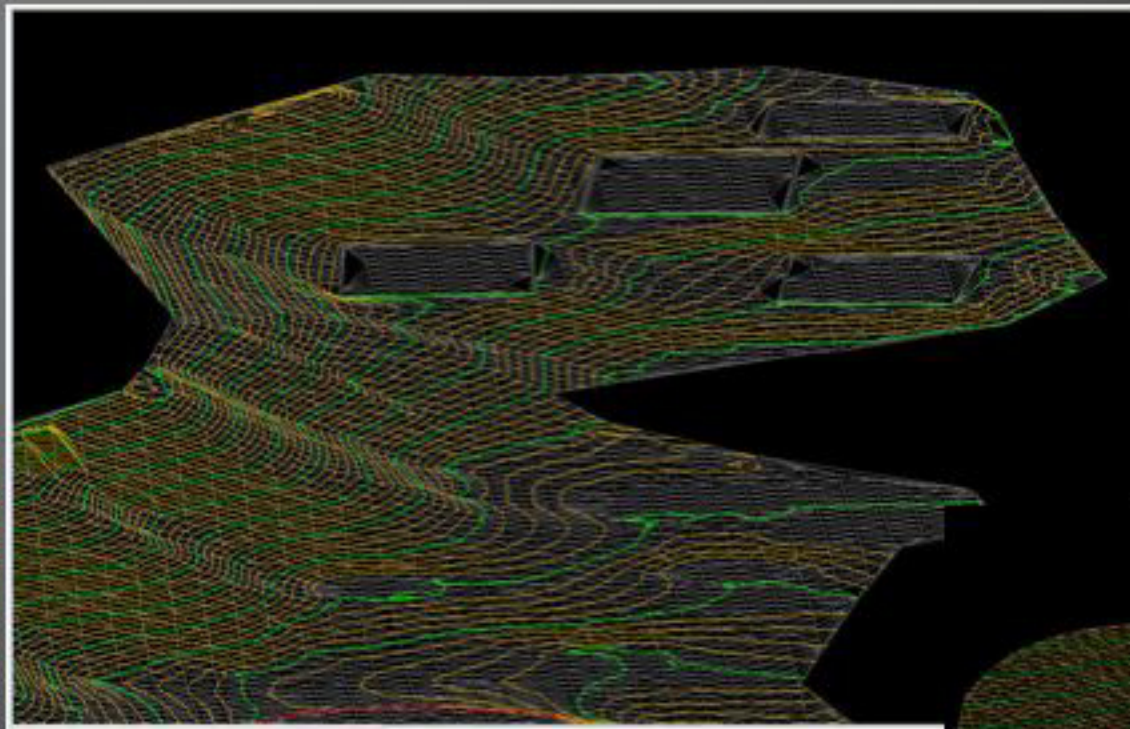
### PLANIMETRIA





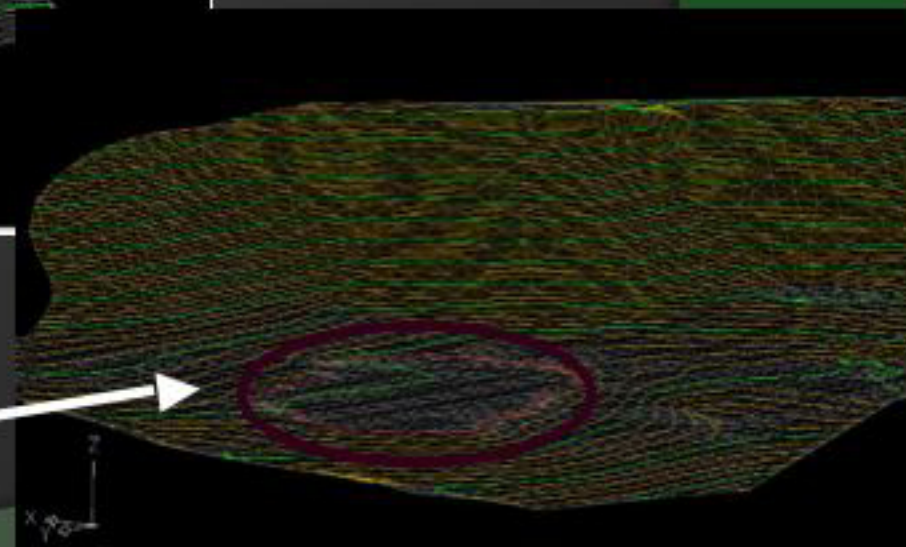
# CASI STUDIO

Campo da golf



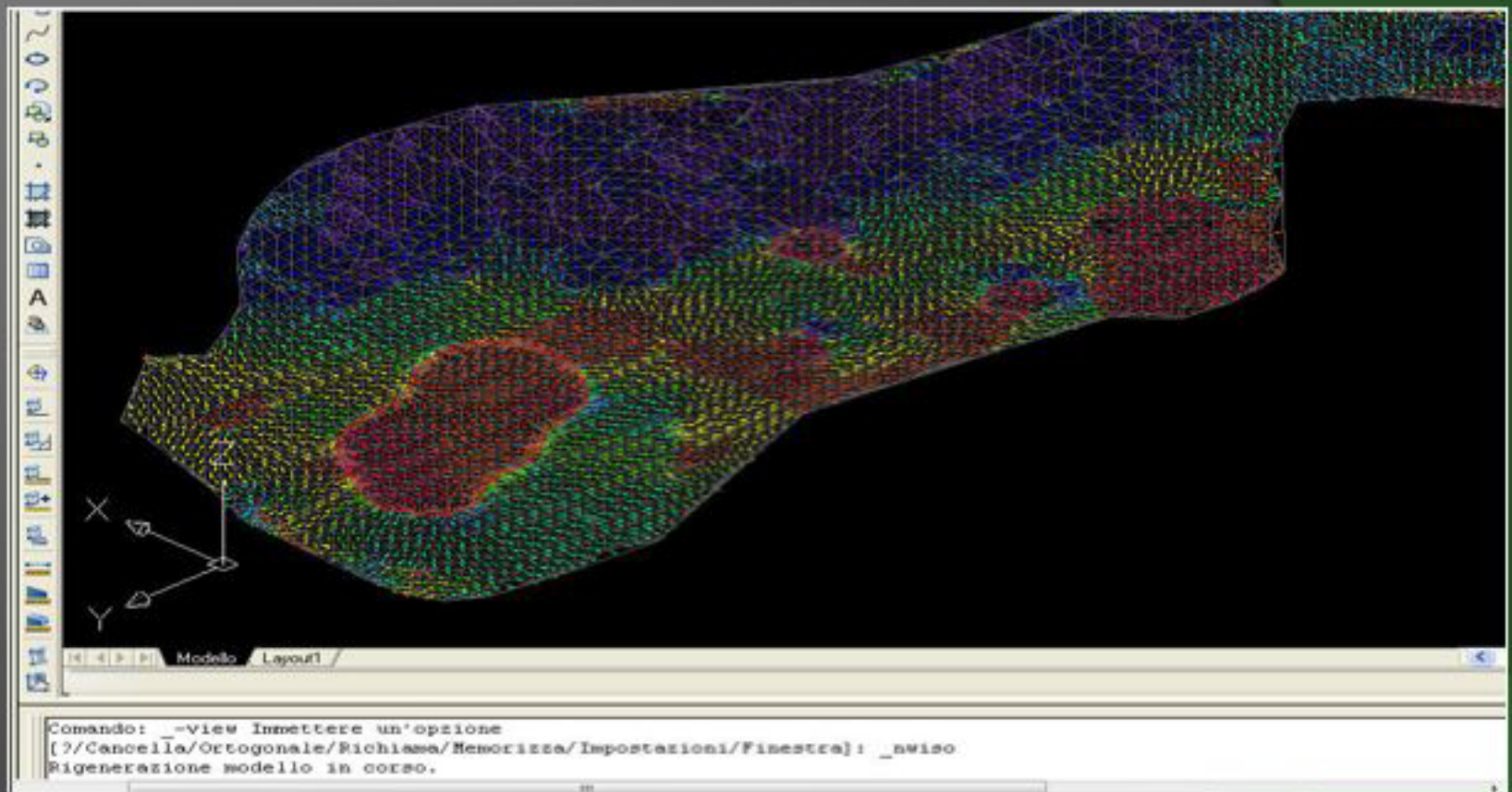
**DTM**

**GREEN**



# CASI STUDIO

## Campo da golf – Analisi della pendenza

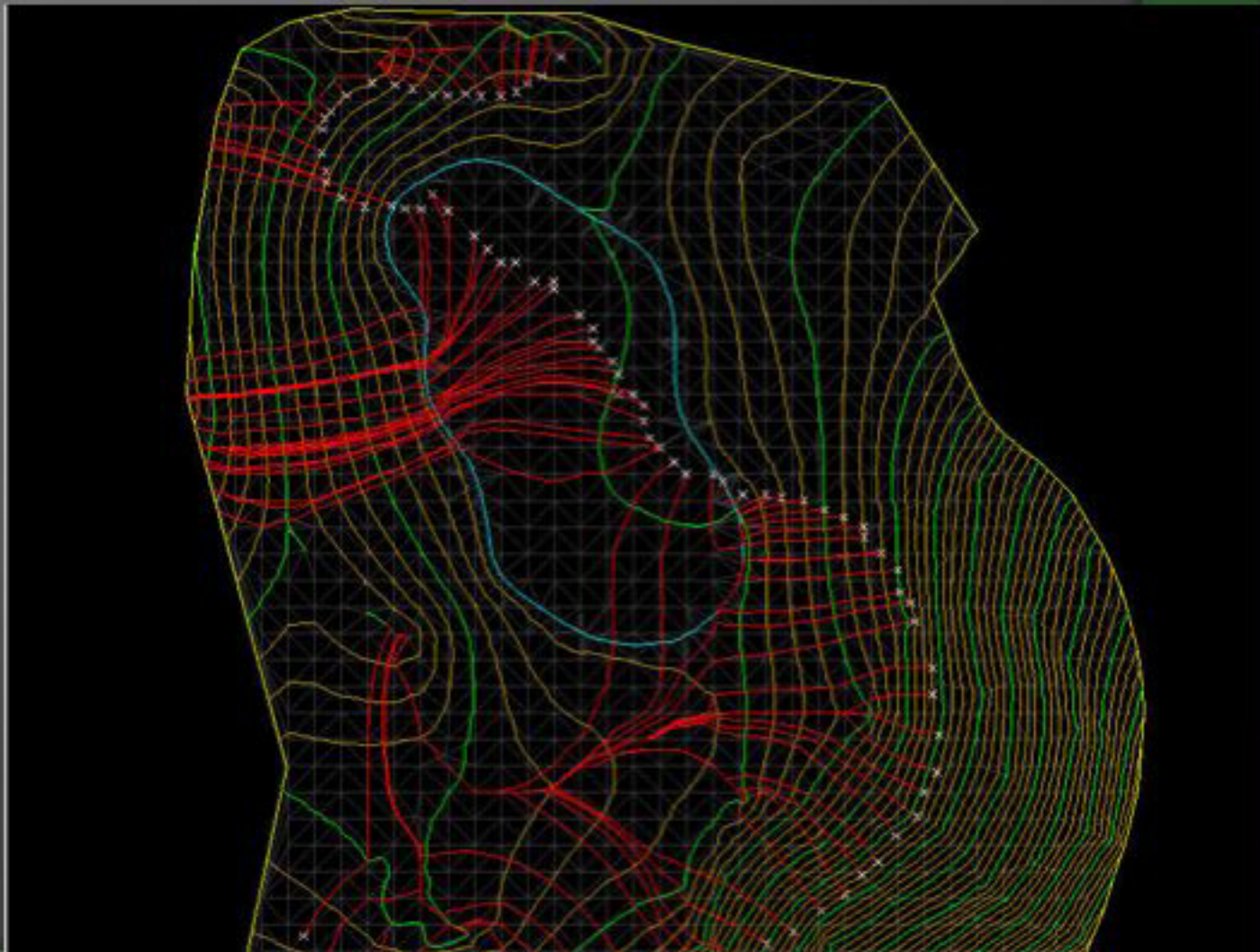


Analisi dei rischi erosivi

Pianificazione degli interventi

# CASI STUDIO

## Campo da golf – Analisi idrografica



# CASI STUDIO

## Campo da golf – Analisi idrografica

### PUNTI DI RACCOLTA



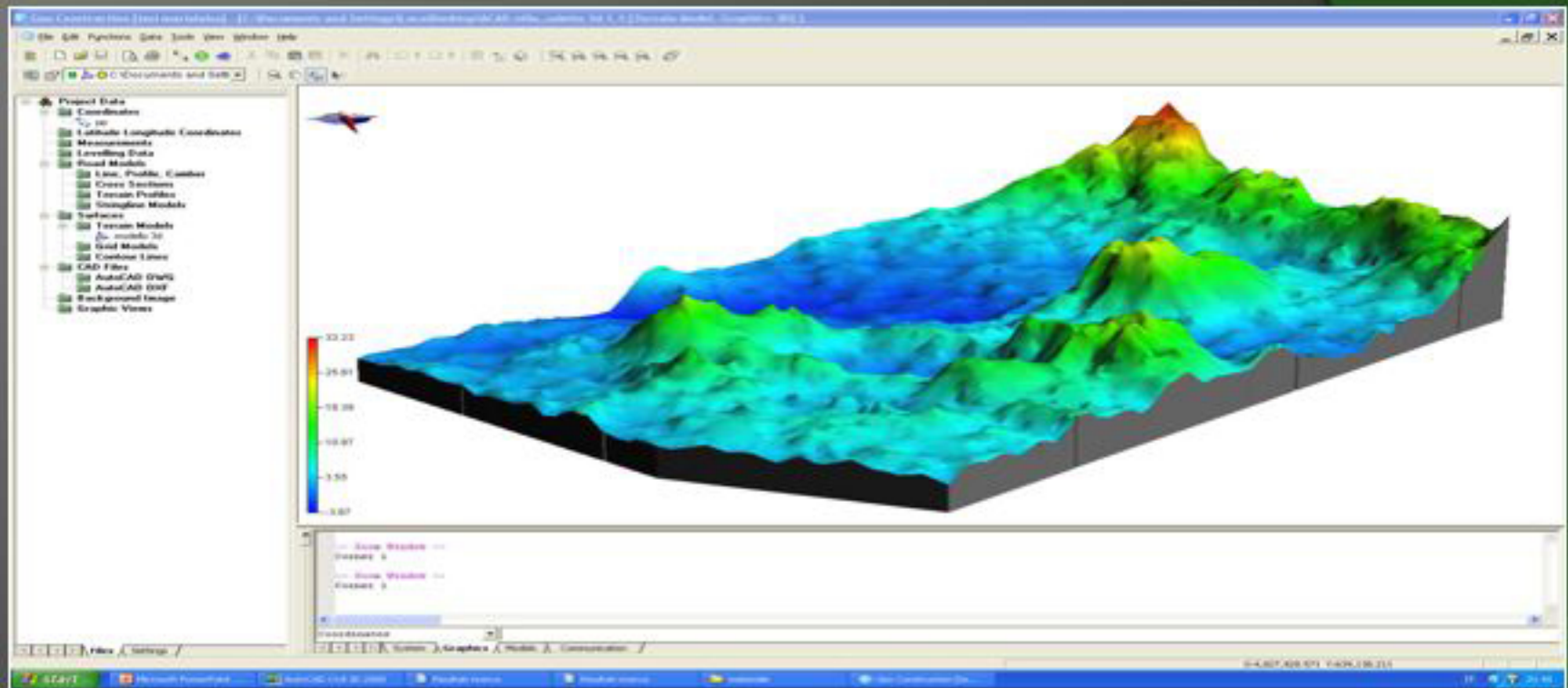
## Tecnologie innovative di VP

### Proximal sensing per l'indagine del suolo: tecnica ARP (Automatic Resistivity Profiling)

- tecnica geoelettrica per monitoraggio dinamico delle caratteristiche del suolo
- l'analisi di basa su rilievi di **Resistività elettrica** (Ohm\*m) del suolo
- tre livelli di profondità indagati: 50-100-170 cm, con circa 30.000 rilievi per ettaro
- abbinamento a DGPS per la georeferenziazione dei dati

# CASI STUDIO

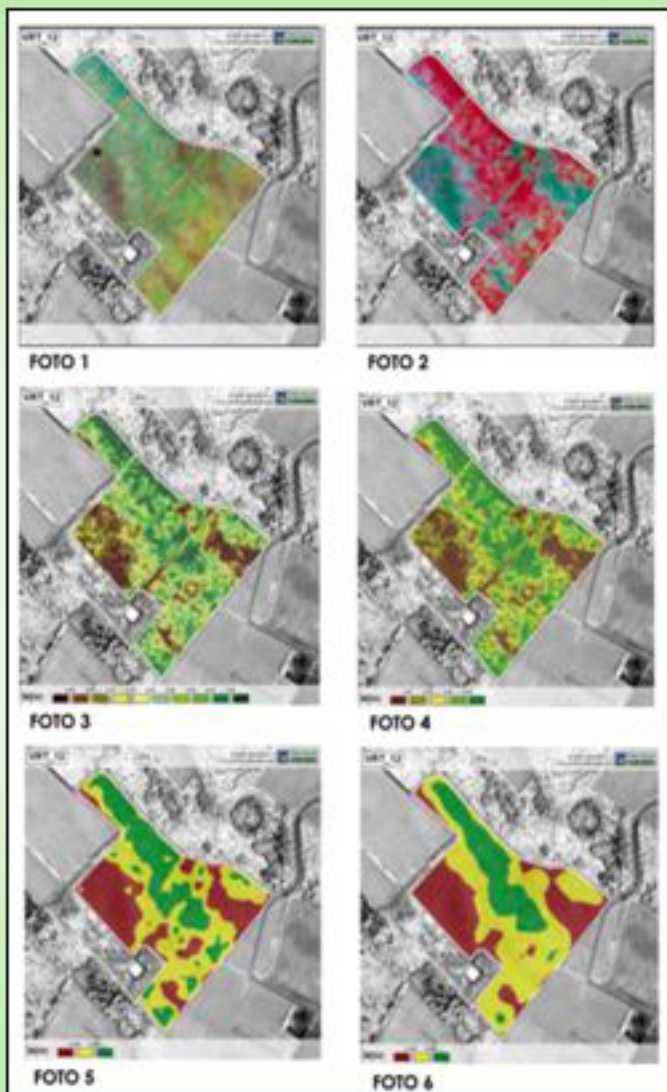
## Campo da golf – Analisi ARP



## MODELLO 3D ARP

## Tecnologie innovative di AP

Fase 1: creazione delle mappe di vigore

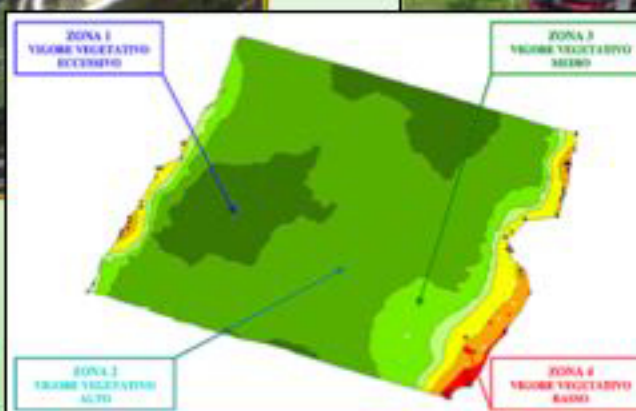


Telerilevamento

Proximal sensing



$$NIR / R = \frac{R_{nir}}{R_r}$$



Mappa del vigore vegetativo (NDVI)

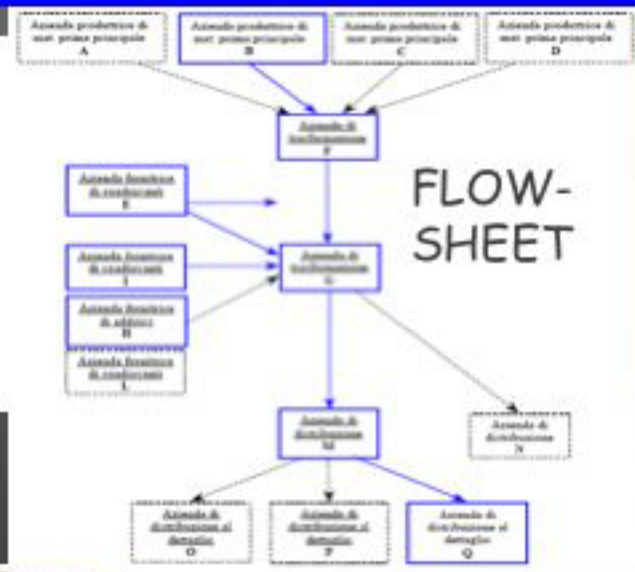
# La gestione dei flussi aziendali



BAR-CODE



LETTORI



- Flow sheet dell'azienda
- Modellazione UML
- Gestione dei lotti aziendali



Rfid





# La certificazione di prodotto passa anche attraverso la **TELEMETRIA** sulle macchine agricole - nuovo strumento dell'Ingegneria Agraria

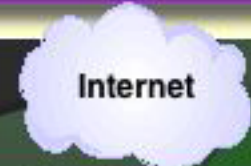


+

TSM- Hardware



GSM-Data (P2P)



+ Internet Browser  
+ Connessione Internet



\*TSM – Tele Service Modul

# Monitoraggio e archiviazione della logistica di lavoro



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Reports Administration Development suggestion Logout

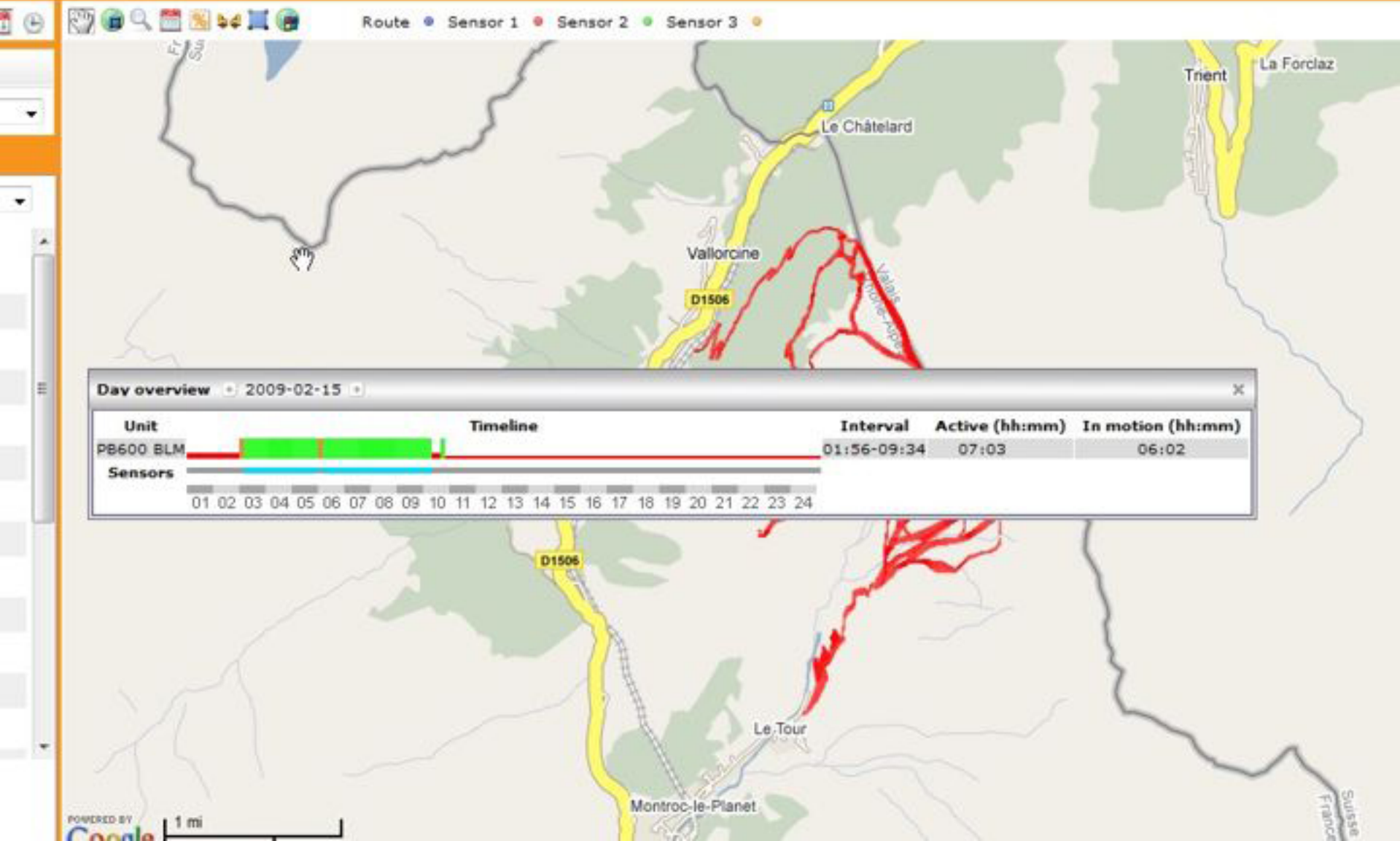
### Work status

Select area: **Tour Vallorcine**

2009-02-15 17:00 2009-02-15 20:15 (0h)

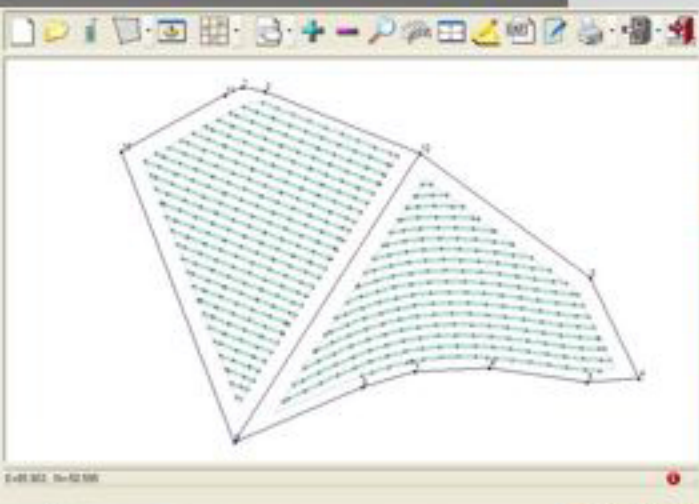
EMOSSON	100%
PISTE BLEUE	100%
STADE ESF	100%
STADE	100%
ALPAGES	100%
VARIANTE BECHAT	100%
AIGUILLETES	100%
POSETTES	100%
LIAISON BALME	100%

Unit ID	First Activity	Last Activity	Engine on	In motion	Standing still	Efficiency	Sensor 1	Sensor 2	Max Speed	Average Speed
1040	2009-02-15 17:30:11	2009-02-15 20:15:19	01:31:00	01:04:00	00:27:00	70.44%	00:34:00(TREUIL)	00:00:00(FRAISE)	16	6
1041	2009-02-15 17:34:27	2009-02-15 18:57:23	01:22:00	01:22:00	00:00:00	99.59%	00:00:00(Sensor1)	00:35:00(FRAISE)	14	5
1042	2009-02-15 17:53:00	2009-02-15 20:05:16	02:11:00	02:10:00	00:00:00	99.74%	00:00:00(Sensor1)	01:16:00(FRAISE)	14	6
1043	2009-02-15 17:29:06	2009-02-15 20:05:20	02:34:00	02:34:00	00:00:00	100.00%	01:56:00(Sensor1)	01:19:00(Sensor2)	16	8
1044	2009-02-15 17:24:41	2009-02-15 20:07:52	02:41:00	02:41:00	00:00:00	99.79%	01:36:00(Sensor1)	01:52:00(Sensor2)	16	7



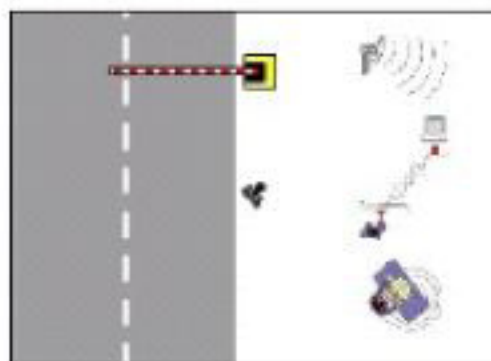
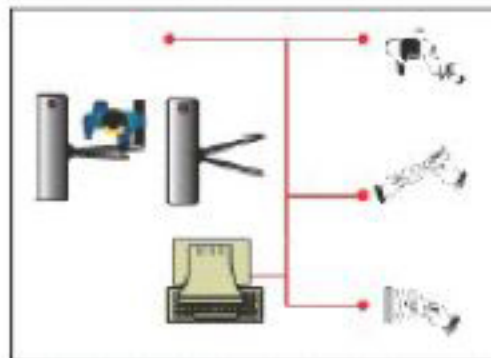
# Trapianto a controllo automatico da base SW vettoriale e DGPS

(2006-2007)



# Anagrafica piante con controllo RFID al trapianto (2008)

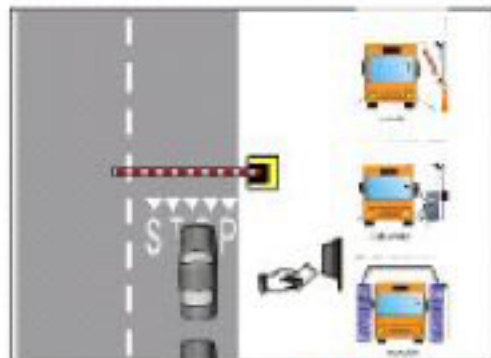
## CONTROLLO ACCESSI



NO - STOP



## CONTROLLO FLOTTE



LOCALIZZAZIONE

