

HYDRO-AIR GmbH



HYDRO-AIR GmbH

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HYDRO-AIR GmbH

Bewässerungssysteme, Maschinen, Pumpen,
Messtechnik und



neue Verfahrenstechnik



sparen Zeit , Energie und verbessern die Produktqualität

Tel. +49+33741 6206-0 Fax: +49+33741 6206-99 E-mail: info@hydro-air.de

50-jährige Tradition in der Beregnungsentwicklung









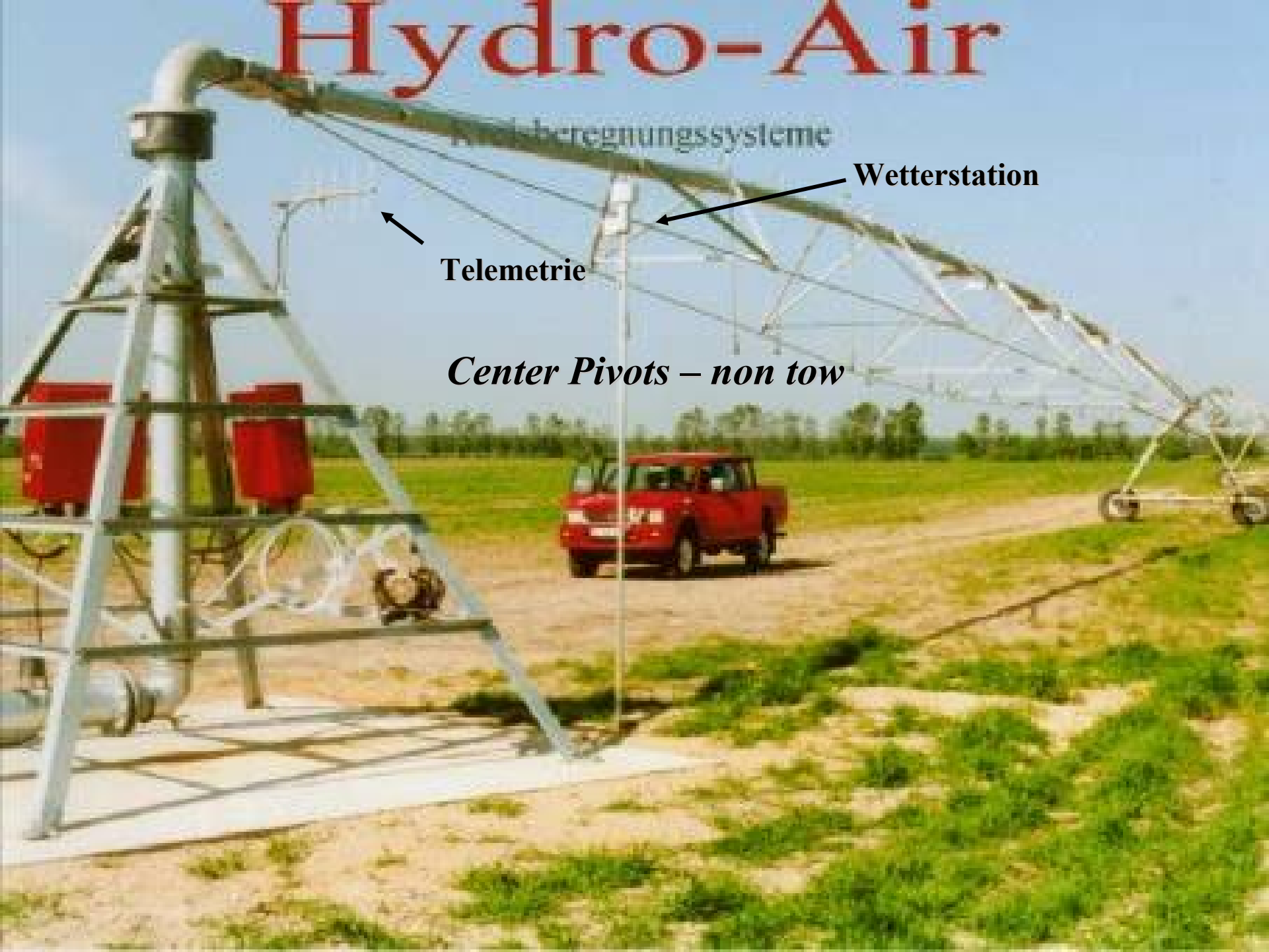
Hydro-Air

Wasserberechnungssysteme

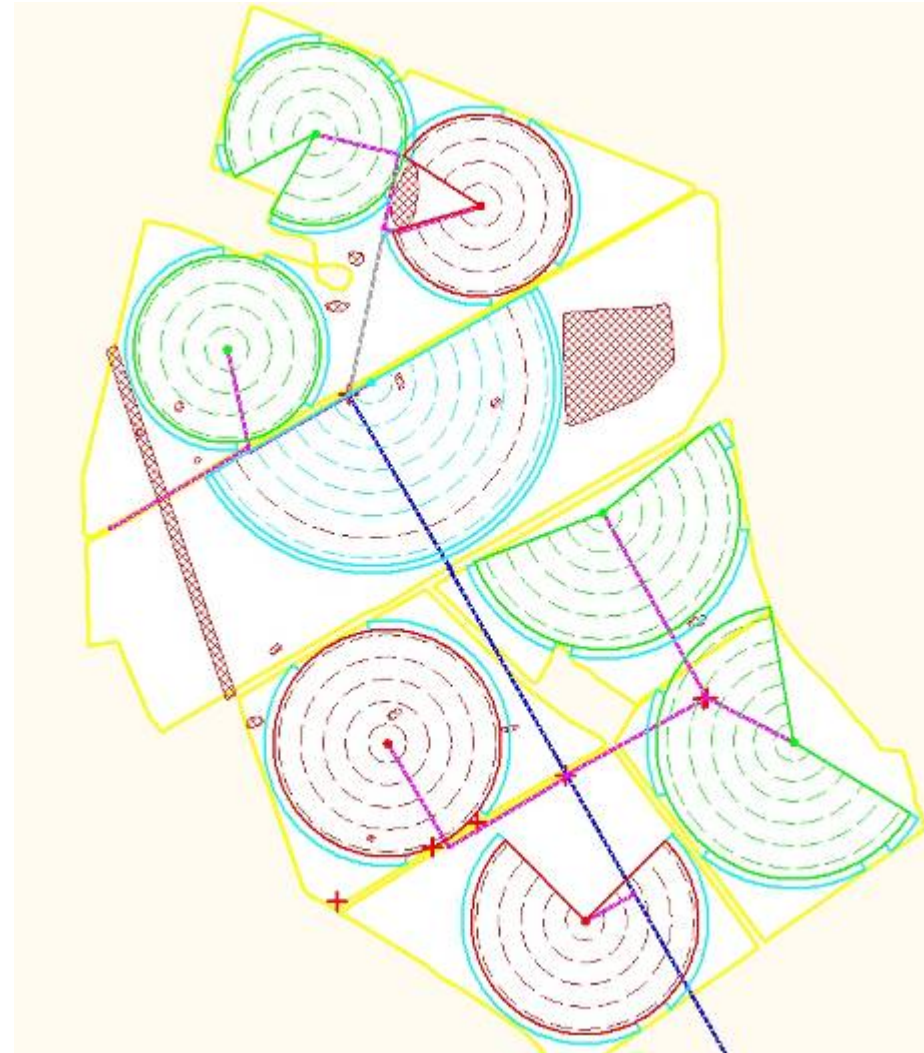
Wetterstation

Telemetrie

Center Pivots – non tow



Bau und Beplanung kompletter Systeme



HYDRO-AIR
International Irrigation Systems GmbH

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International Irrigation Systems GmbH

Reihenzahl von Rohren/Abzweig
PE-Rohr neu 2,51 ... 0,02
Stahlschraube neu 0,02 ... 0,05
Gabelrohr neu 0,25 ... 0,50
Vertikale Höhe 1,00 ... 4,00

Widerstandszahlen
Bogen 0,20
Trennflapen/Schwächenlage 0,25
Gerade Schieber 0,60

Vorliegende Strömungsart

Laminare Strömung bei Re = 2.300	
Übergangsbereich von Re = 2.300 bis 5.250.000	X
Turbulente Strömung bei Re > 5.250.000	

Zwischenergebnisse

Druck p	1000,00 Pa
dyn. Druck	0,02 bar
Kinematische Viskosität ν	1,257E-06 m ² /s
Rohrreibungszahl λ	0,0072
Spez. Verlustenergie (Rohr) hu	0,0072 m/m
Spez. Verlustenergie (Höhe) hu	0,00 m/m
Spez. Verlustenergie (Widerstände) hu	0,00 m/m

Ergebnisse Gesamtsystem

Rohrleitung	1,219 bar
Höhendifferenz	0,000 bar
Widerstände	0,000 bar
Zusatzverluste	0,000 bar
Summe	1,219 bar

HYDRO-AIR International Irrigation Systems GmbH



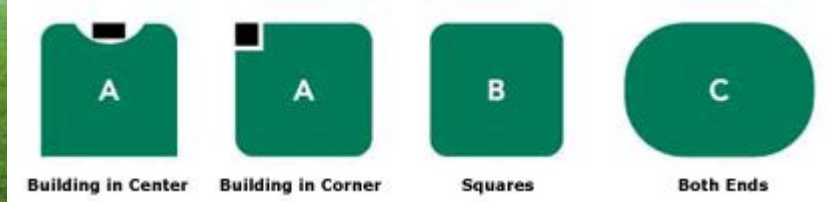
Pumpensteuerung



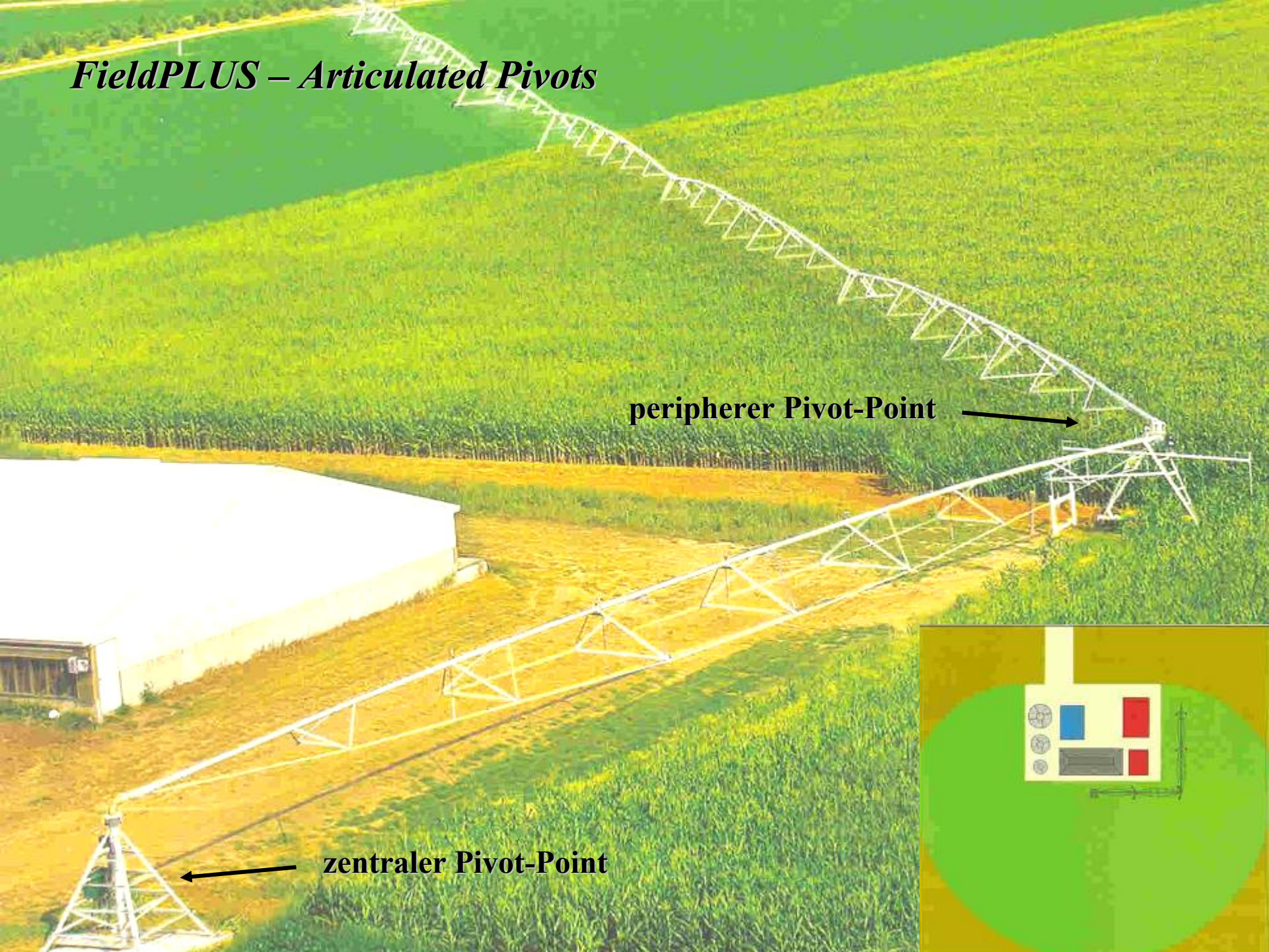
Netzanschlußsäule







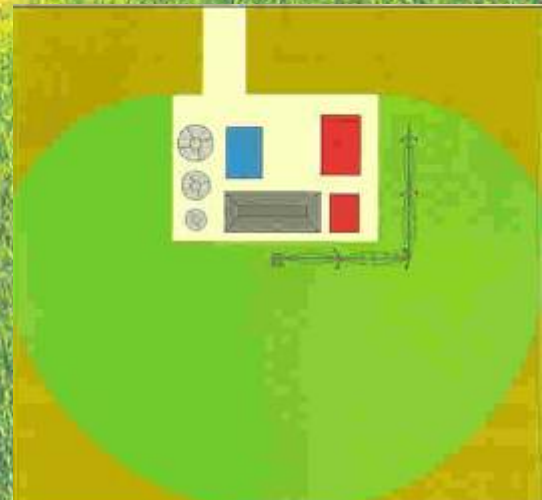
FieldPLUS – Articulated Pivots



peripherer Pivot-Point



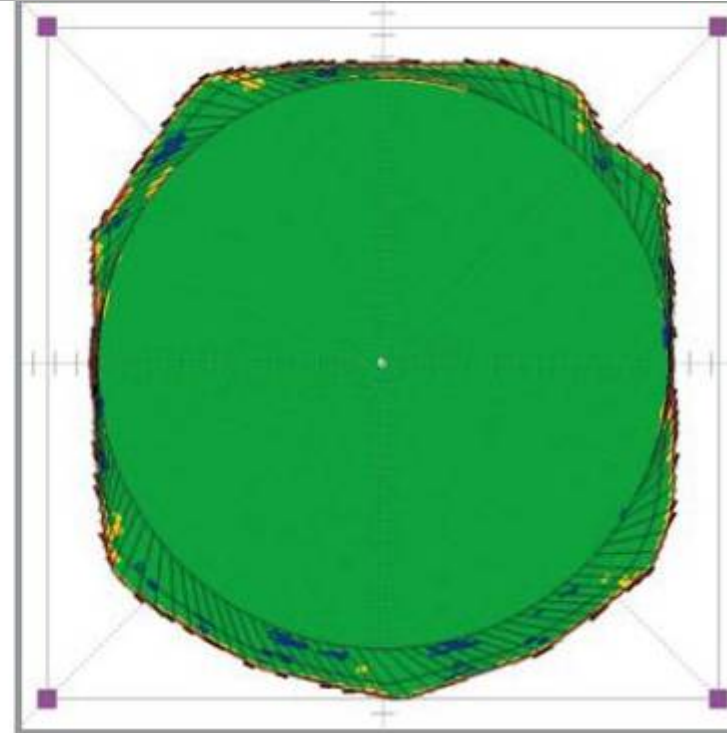
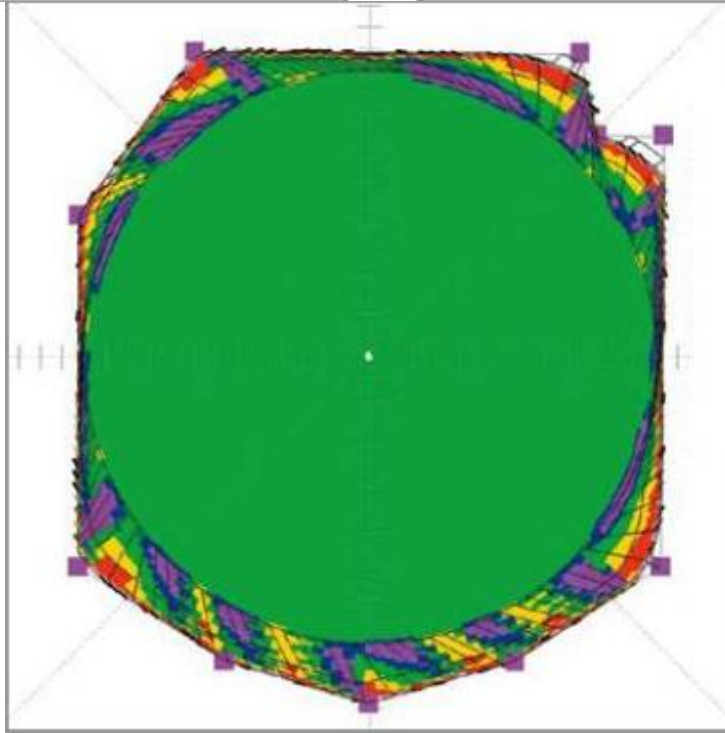
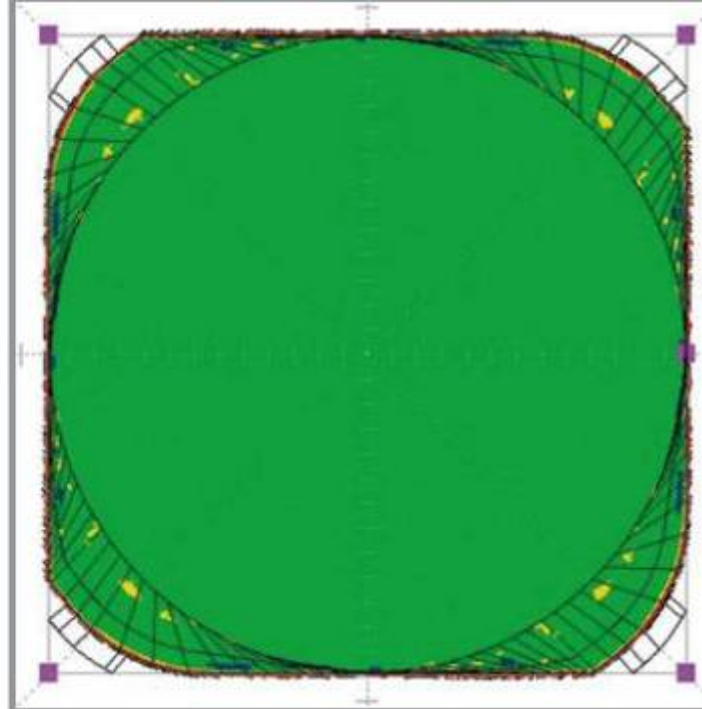
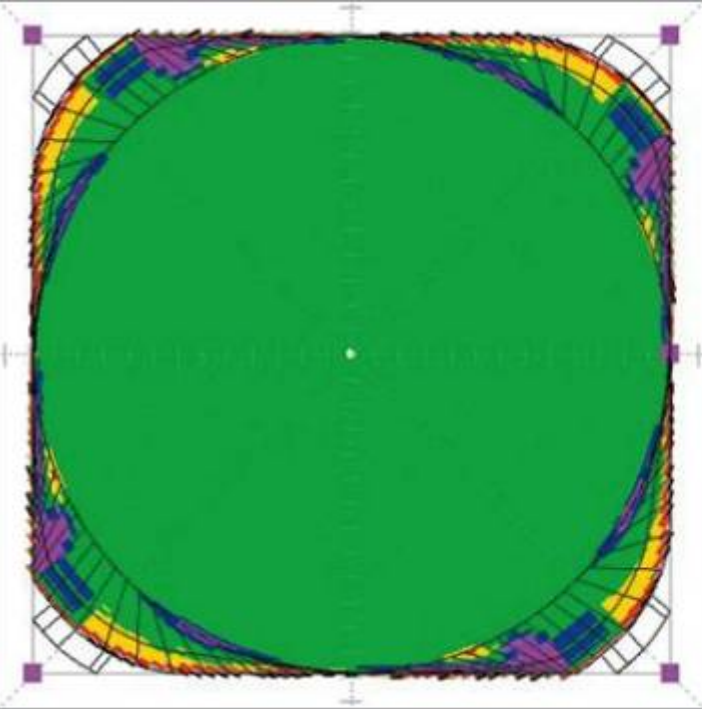
zentraler Pivot-Point



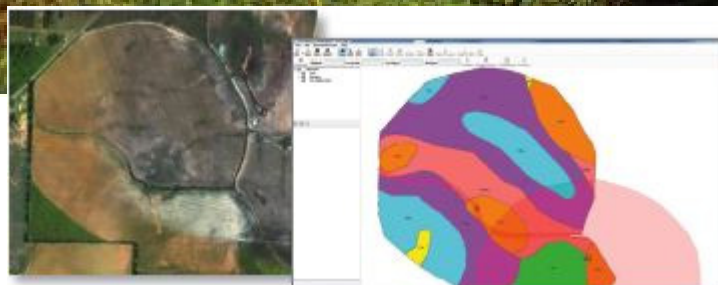
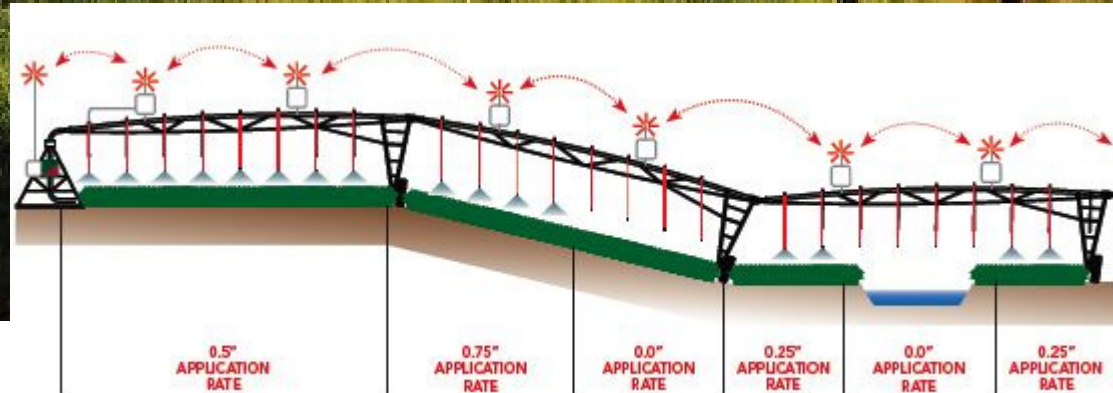
Wasserverteilung
im Vergleich:

Links: Altes
Corner-System

Rechts:
Computergesteuer
tes System



Präzisionsberechnung



Standortunabhängige Steuerung:

- Über Internet
- Handy
- SMS

Home Devices Reports Alerts

List Groups Communication

Enter Location

Map Hybrid Satellite

Refreshed: Aug 2, 5:01 PM

Home Devices Reports Alerts

List Groups Communication

NAME: TYPE: FieldVISION ID: 0 GROUP: My Group

Vision Zone

Revolution Time: 13 hrs 10 min

Status	Stopped
Rate	100.00%
Duration (hrs)	218.4
Last Change	Jul 24 2:37 pm
Pressure (bar)	0.1
Volts	402
Temp (C)	33.3
Flow (lps)	0
Total Liters	

Position: 89.8

Set Rate % mm

Set Service Stop

Repeat ON

CONTROL START/STOP H₂O CHEM ACC.1 ACC.2 AUTO-REVERSE AUTO-RESTART

End-gun End-gun

Device was last polled on Aug 2 4:55 pm

7:16 AM

FieldNET

m.lindsayfieldnet.com

Back Menu

Name: Southwest

Revolution time: 89 hrs 53 min

Current Status: Reverse wet

Rate: 15%

0.53 in

Duration: 1 hrs

Last change: May 15 6:42 am

35 psi

480 V

0 gpm

90 F

More Status >

Manual Mode

Device was last polled on May 15, 2010 07:42 AM



Chemigation/Fertigation

THE MOST ADVANCED INJECTION SYSTEM TO HELP YOU GROW

GrowSmart's Hydra Inject chemical injection series makes managing chemical and fertilizer resources easier than ever. With simple operation, precision application and built-to-last durability, you can apply the chemicals and fertilizer your fields need to increase crop quality and yields:

- Simple control and setup
- Pulse-free flow for precise adjustment of injection rates
- Built-in safety features for reliable and accurate performance
- Integrate with GrowSmart control systems for simple monitoring and management
- Three available lines to match your system and application needs
- Trailers feature large cone-bottom tank with mixer, for easy towing to multiple fields
- System integrates with FieldBOSS control panel for automated startup and shutdown

GrowSmart Injection Systems

Hydra Inject I – easy-to-use, low-cost system

- Variable-frequency motor drive
- Potentiometer-controlled rate adjustment
- Visual flowmeter
- Low maintenance
- Optional calibration tube

Hydra Inject II – computer controlled injection requires no calibration

- Variable-frequency motor drive
- Easy rate adjustment
- Visual flowmeter
- Digital readout of flow rates and totalizers
- Scalable low injection rate shutdown



Managementsysteme für Feldberegnung und Abwasserausbringung

Wetterstation



ferngesteuerte
Ausbringung mit
Kreisberegnungsanlagen

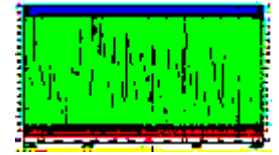


Bodenfeuchtesensor



Datenübertragung
per Funk

Herunterladen der Daten



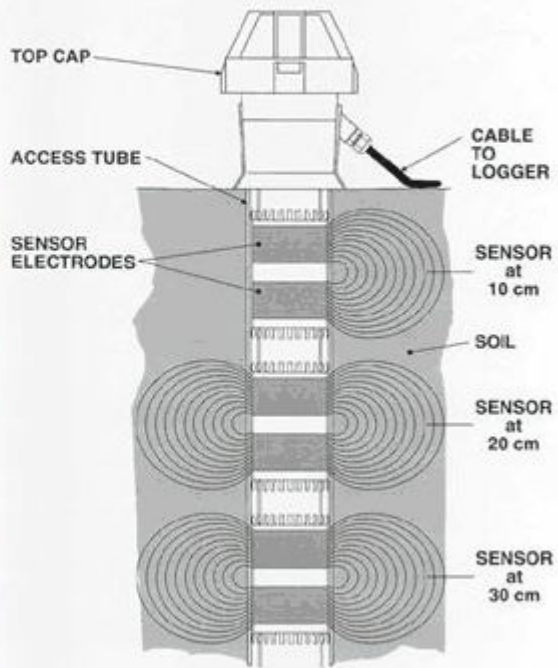
auf dem Feld ...



... oder vom Büro aus über Funk

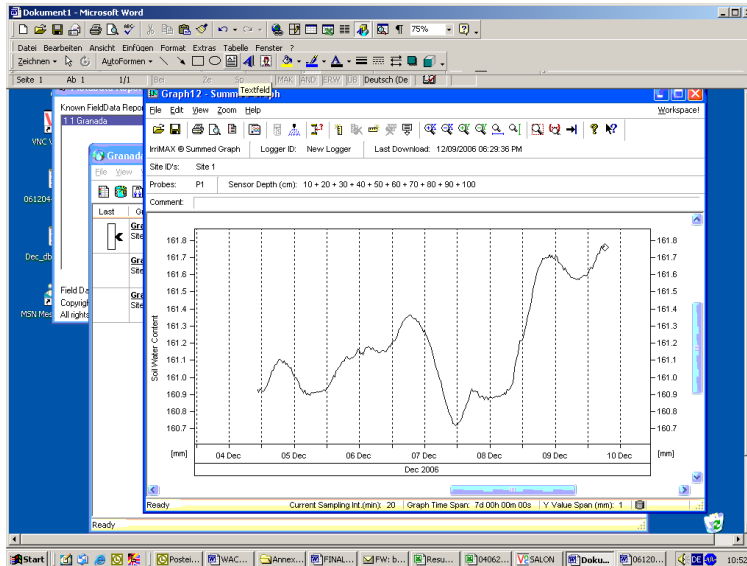
Sentek
ENVIRONMENTAL ANALYTICS

EnviroSCAN PROBE DESIGN



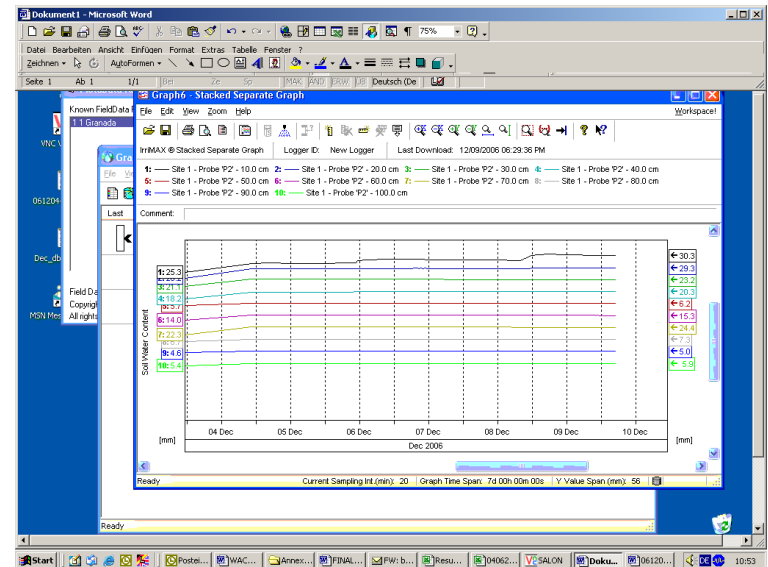
Computerüberwachung

Graphiken



Summengraph Gesamtwassergehalt von einer Sonde gemessen

Unterteilte Graphen Wassergehalt bei verschiedenen Tiefen



SmartCrop™ Automated Crop Stress System



Listen to your crop... It's talking to you

Your crop is telling you when it is experiencing heat stress and needs water. The SmartCrop Automated Crop Stress Monitoring system is smart technology that uses infrared (IR) temperature sensing technology coupled with patented USDA algorithms and methodology to determine when your crop is experiencing heat stress brought on by a lack of water. Not like other more complicated and expensive IR systems, SmartCrop provides growers a simple "IRRIGATE / DON'T IRRIGATE" signal that can be seen on the web or even on your cell phone. In addition to irrigation signals, the SmartCrop system provides temperature and other environmental data via the SmartCrop web site. This data can be viewed in easy to read graphs, or downloaded to your own PC for analysis using spreadsheets or data-analysis tools.

How it works

The SmartCrop Automated Crop Stress Monitoring system uses multiple Sensors in the field to collect canopy temperature data using digital infra-red temperature sensors. Each Sensor collects data and sends it via RF signal back to the Base Station every 15 minutes. The Base Station collects the crop canopy data from each Sensor. Using the crop canopy temperatures from each Sensor, along with other localized environmental measurements, the SmartCrop web server determines if the crop is in stress or not. This decision process is performed every 15 minutes throughout the day.

The SmartCrop web site keeps track of how much stress is accumulating in the crop and will signal for irrigation when a minimum stress time has been reached. This stress time, along with other crop factors is easily programmed into the web site during setup and these factors can be changed remotely during the growing season.

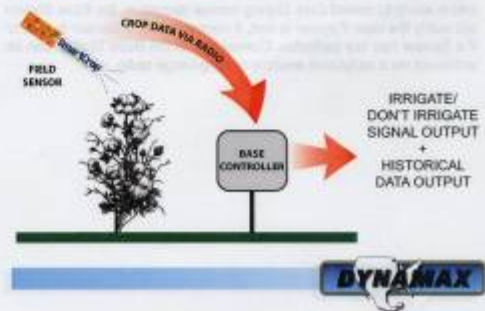
System Components

The SmartCrop Automated Crop Stress Monitoring system is made up of three main components: The Sensor, the Base Station, and the web site. Multiple Sensors (up to 128) can be used in a single application to gather a more complete set of data.



Features

- Licensed BIOTIC USDA Irrigation control process
- Monitor crop stress remotely
- New IR technology can detect drought stress
- Wireless IR sensors
- Internet or cell phone data retrieval
- Weather station data also available
- Up to 128 IR sensors per system
- Great for crops, orchards or greenhouses
- US Patent No. 5,5539,637



SmartCrop™ Specifications

Field Sensors

The Sensor is a long plastic tube that contains the electronics used to measure, collate, and transmit crop canopy data. At the heart of the Sensor is an industrial IR temperature sensing device that measures the actual temperature of the crop canopy. This temperature data is collected and processed by a microprocessor in the Sensor. At 15 minute intervals, the microprocessor turns on the radio transmitter and send the latest set of temperature data directly to the Base Station.

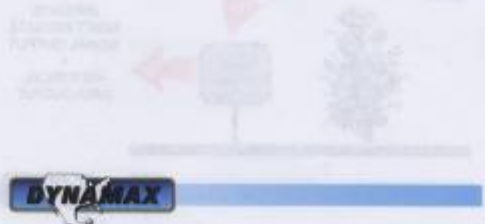
The Sensor runs on four AAA batteries which will power the Sensor through an entire growing season. The Sensors mount on a standard, lightweight metal fence post which allows the Sensor to be adjusted during the growing season to an appropriate angle and height. All of the Sensors are "imprinted" to the Base Station in a simple setup process that takes only a few minutes. Once this relationship is established, the Base Station will only record information from its Sensors even though it might be in range of Sensors from other systems in nearby fields. This "imprinting" process can be repeated as needed and makes for a data collection system that is very robust and yet easily reconfigurable.

Base Station

The SmartCrop web server is the manager of the SmartCrop system. It collects all of the Sensor data, collects localized environmental data, and runs the patented USDA algorithms to determine crop stress.

However Base Station can collect a large amount of data. This data is stored in the Base Station's on-board flash memory and is downloaded via cell phone modem. This data consists of ambient temperature readings and canopy temperatures at each Sensor, humidity and ambient temperature, and rainfall amounts at the Base Station.

The set up of the Base Station is performed by placing the Base Station in the learn mode and then placing each Sensor that is to be "imprinted" into the learn mode as well. While in the learn mode, the Base Station is looking for a specific signal that is only sent by Sensors also in the learn mode. If the Base Station hears a Sensor not in the learn mode, it will not "imprint" to this Sensor. Once all of the appropriate Sensors have been learned, the Base Station is taken out of the learn mode and is ready to collect data. During normal operation, the Base Station will notify the user if power is lost, if connection to a Sensor is lost, or if a Sensor has low batteries. Connection to the Base Station can be achieved via a cellphone modem or long-range radio.



IR Field Sensor Specifications

Description: Compact digital thermopile module
Measurement Range: -33° C - 220° C, (-27° F - 428° F)
Operating Range: -10° - 50° C, (14° - 122° F)
Accuracy: ±0.6° C
Resolution: 1/10° C
Wave Length: 5µm - 14µm
Dimensions: 18" x 2.4" dia

RF Module

FCC ID: W8B15030205
Radio: 915 mHz
Data Rate: 10k BPS
Max Number of Sensors per System: 128
Range: 1000' LOS from base station

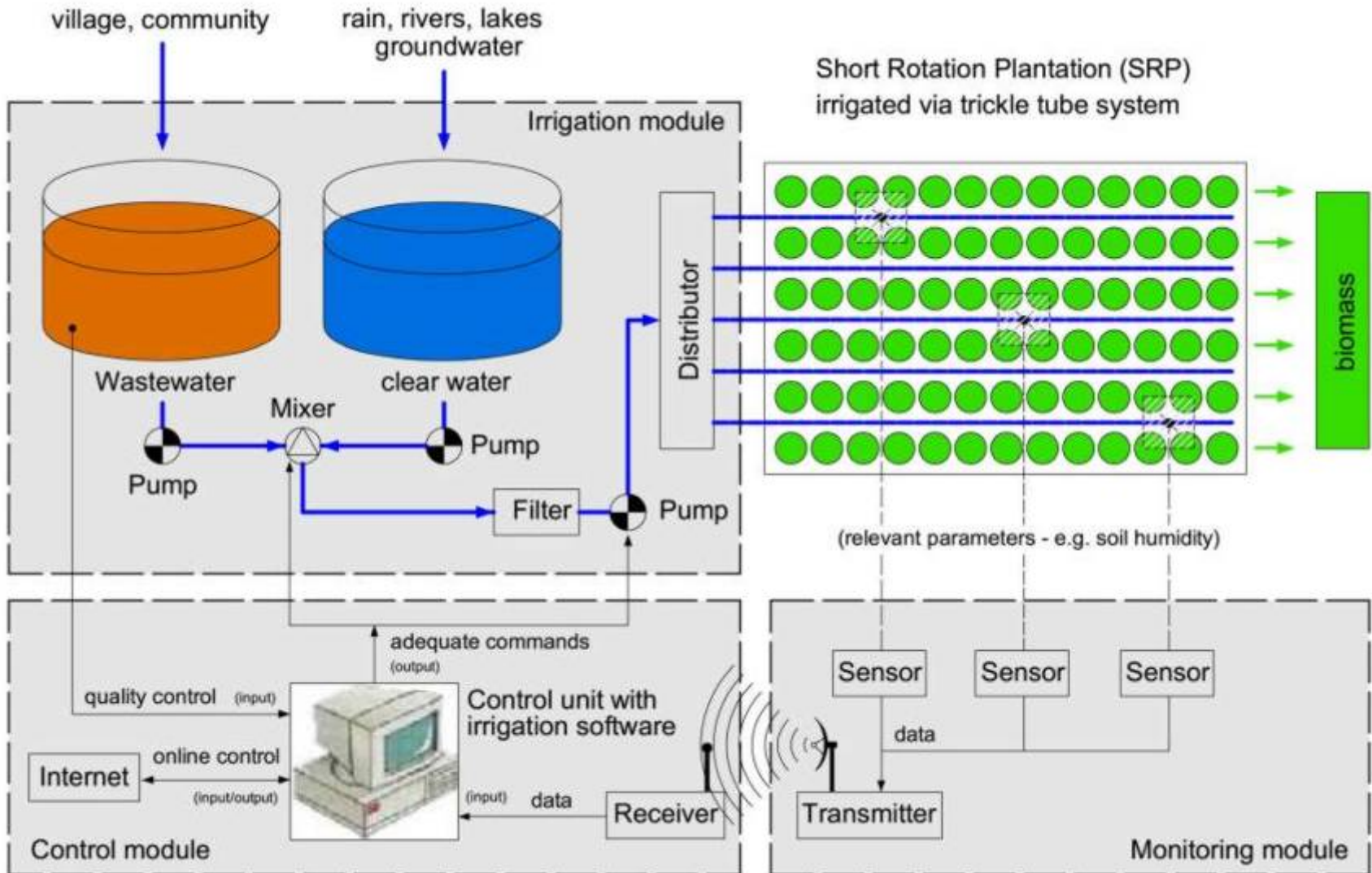
Base Station Specifications

Dimensions: 8" x 9" x 5"
Weight: 1.5 lbs
Cellular Data Retrieval:
FCC ID: W8B15010302
Quad band GPRS GSM Phone:
Dual US/World
Antenna: 4 dB
Range: 10 miles estimated
Memory: 128 KB, 670 records with 4 sensors at 15 min. readings
Readings: 4 sensors at 15 min. for 1 week

Humidity & Temp Specifications

RH Operating Range: 0 - 100% RH
T Operating Range: -40° - +125° C
Maximal Accuracy Limits for RH:
 ±2% from 10% to 90%, ±4% <10% >90%
Maximal Accuracy Limits for Temp:
 ±0.3° C at 25° C, ±0.6° C from 0 to 50° C

WACOSYS Prototyp





Schmutz- und
Abwassercontainer sowie
Container mit Prototyp



Beregnungsmodul I



Beregnungsmodul II
Leitungssystem



Beregnungsmodul II
Tropfschlauch

Berechnungsmodul

Vorteile: Vergleich Tropfschlauch
mit regionaler Bewässerung

Wasserverbrauch:

Vor WACOSYS: 2500 m³ /
Ha*Jahr

Nach WACOSYS: 1060 m³



Übliche regionale
Bewässerung



Tropfschläuche

Sensorüberwachung



Bodenfeuchtesensoren



Sensor mit Stromversorgung



Datenlogger und
Funkübertragung



Solarmodul mit
Richtantenne

Vergleich Frischwasser - Abwasser



Feld 1 (mit Frischwasser beregnet) gegen Feld2 (Mischung aus Abwasser und Frischwasser)



Ihr kompetenter Partner, wenn es ums Wasser geht



DIN EN ISO 9001
Zertifikat 151009684

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6206 99 E-mail: info@hydro-air.de
Homepage: www.hydro-air.de



BIOWARE Prototyp



Entnahme aus
Vorklärbecken

Zuleitung zum Feld

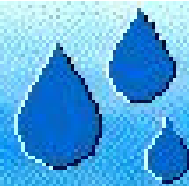


Sensorüberwachte Ausbringung mit Tropfschlauch



Sensoren
Zur Messung des
Nährstoff-
und
Wasser-
gehaltes

BIOWARE



Programms

Areas

Settings

Start

Landscape

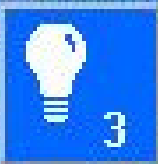
Extras



1



2



3



4



5

Tropf1

Tropf2

Regner1

Zone 4

Zone 5

7

8

9

10

11

Zone 7

Zone 8

Zone 9

14.10.2011 13:01:44 Vers 00

Fernwartung der Steuerung
über den Browser

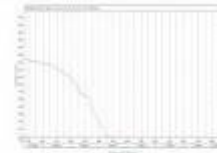
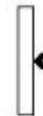
Auswertung der
Sensordaten am Rechner

Auswertung und Steuerung

13.10.2011

BIOWARE

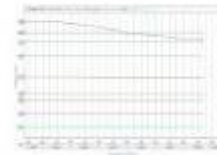
14.15.56



Graph1

Soil Water Content

Logger 'China1' - Site 'Default' - Probe 'P1'
Last reading at 13/10/2011 03:45:00 PM



Graph1

Soil Water Content

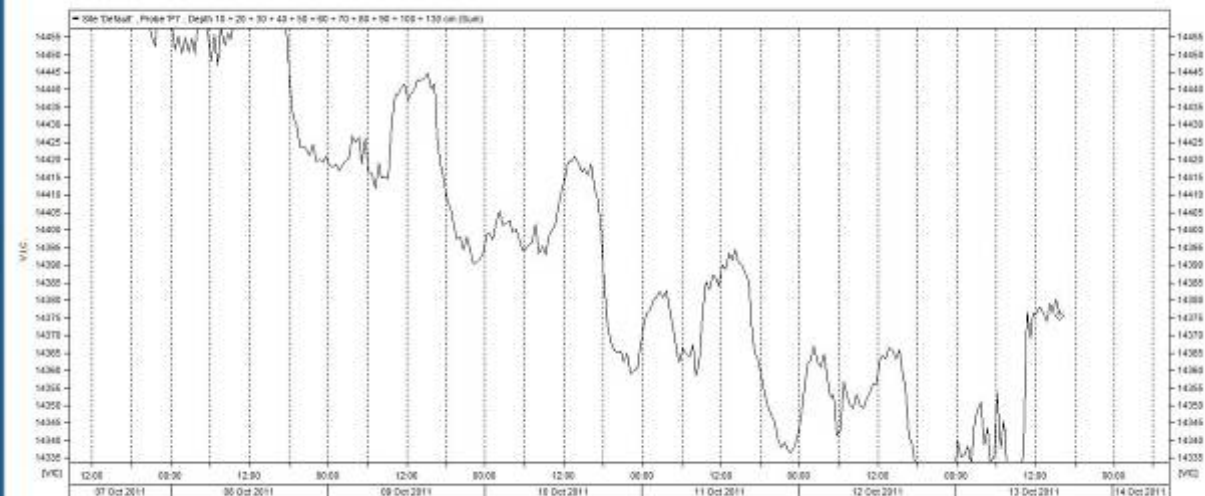
Logger 'China1' - Site 'Default' - Probe 'P1'
Last reading at 13/10/2011 03:45:00 PM



Graph2

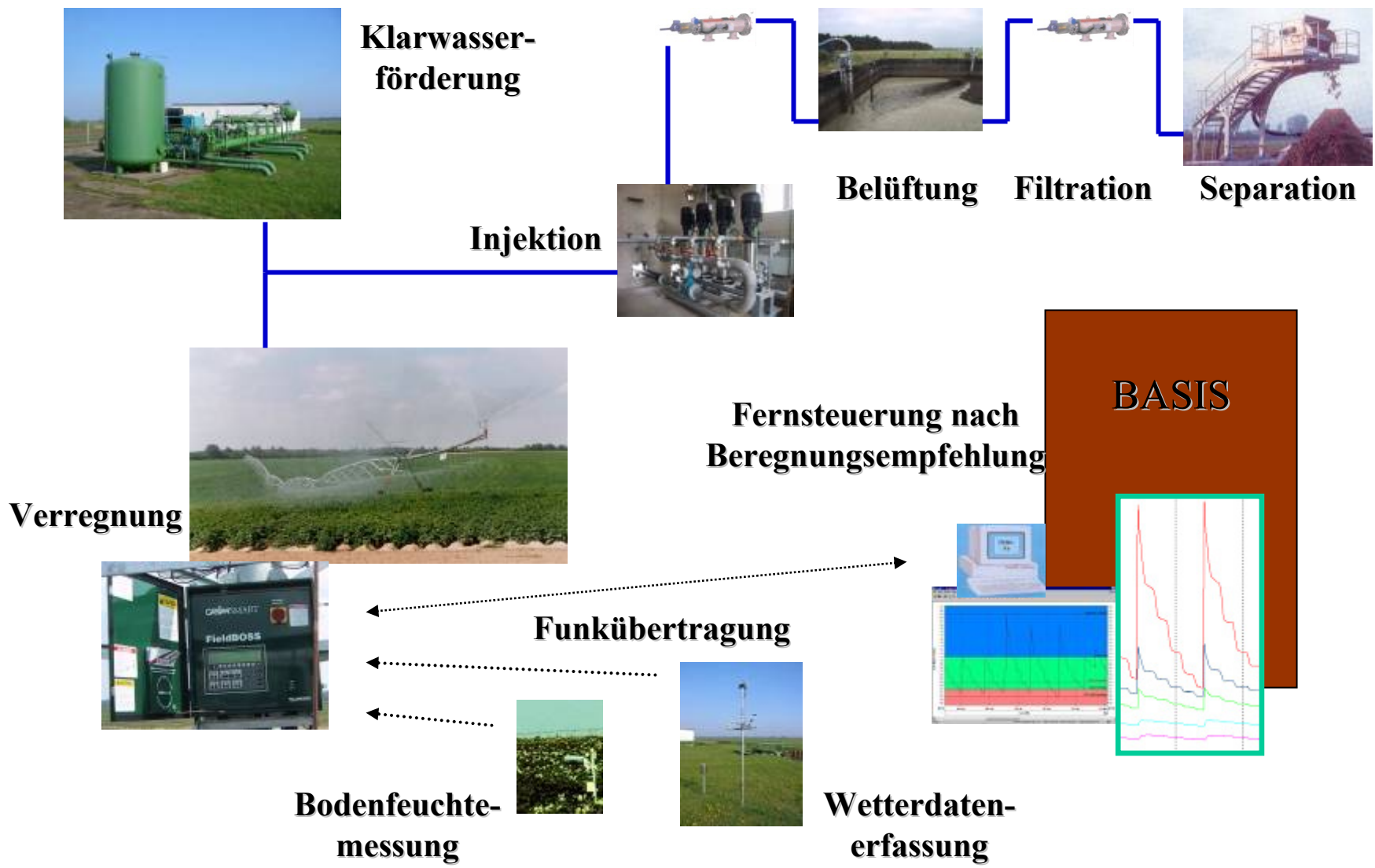
V.I.C.

Logger: China2
Last Reading: 13/10/2011 03:45:00 PM
Comment:



Generated by Winbox™ Server Pty Ltd

Systemübersicht



Gülletechnik

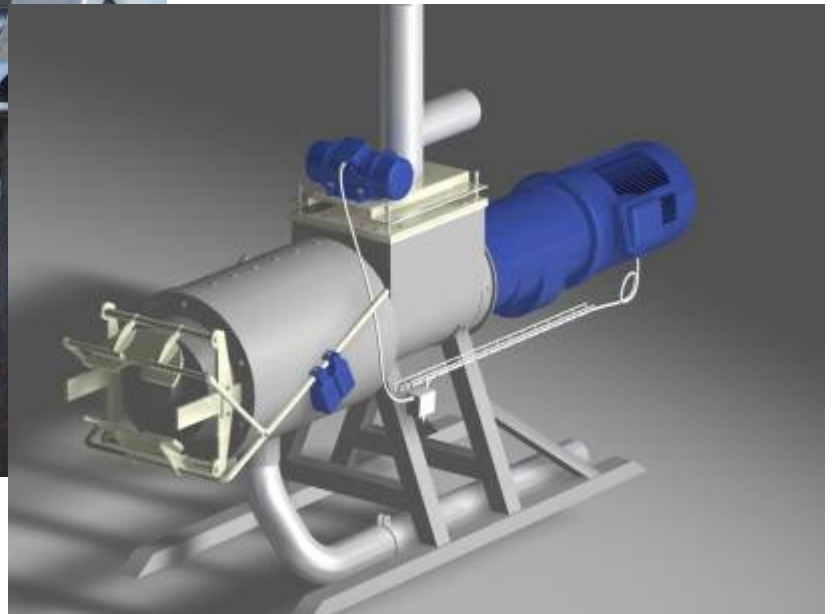


Gülle-Separatoren



Belüftungsrührwerke und Güllepumpen



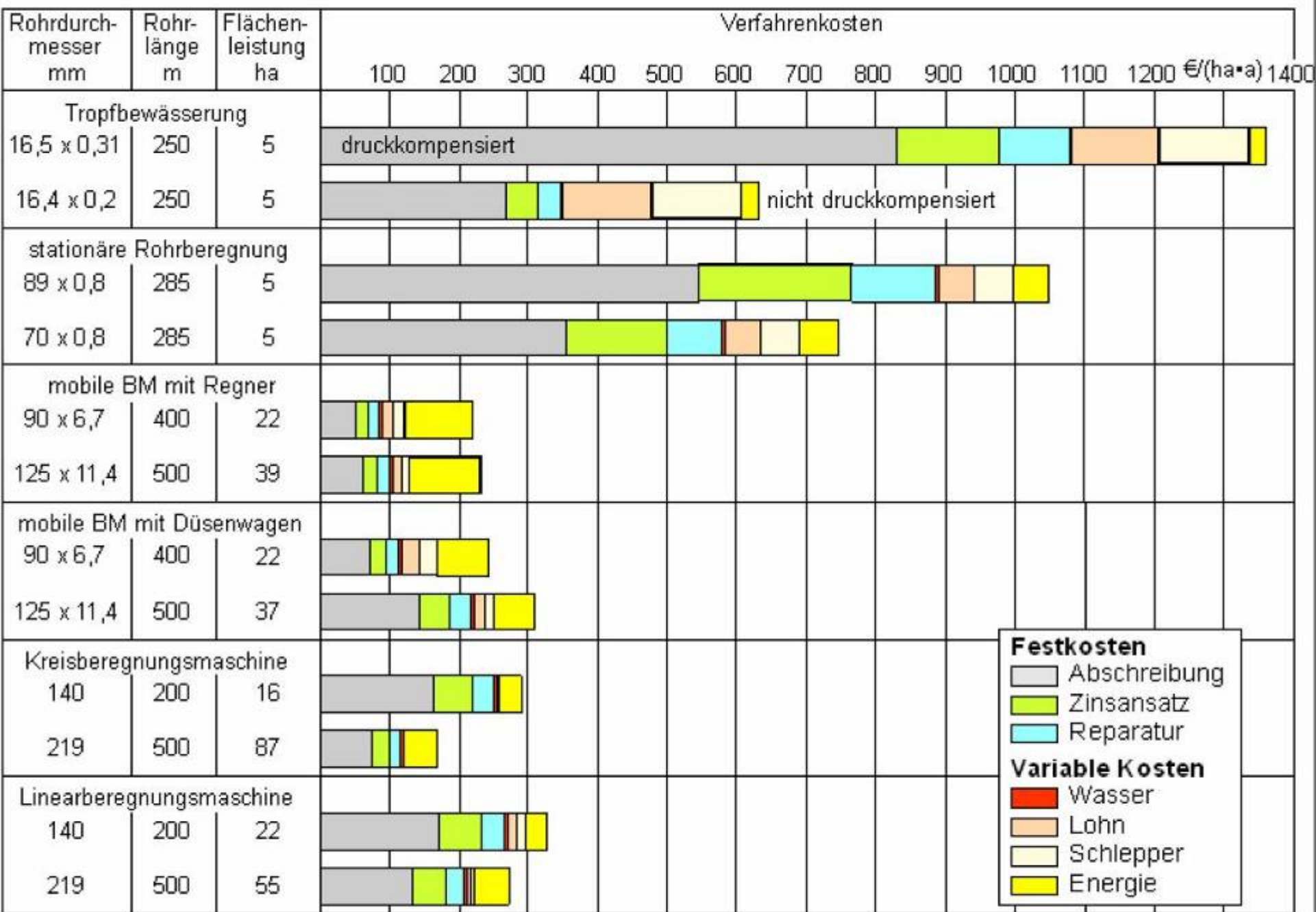


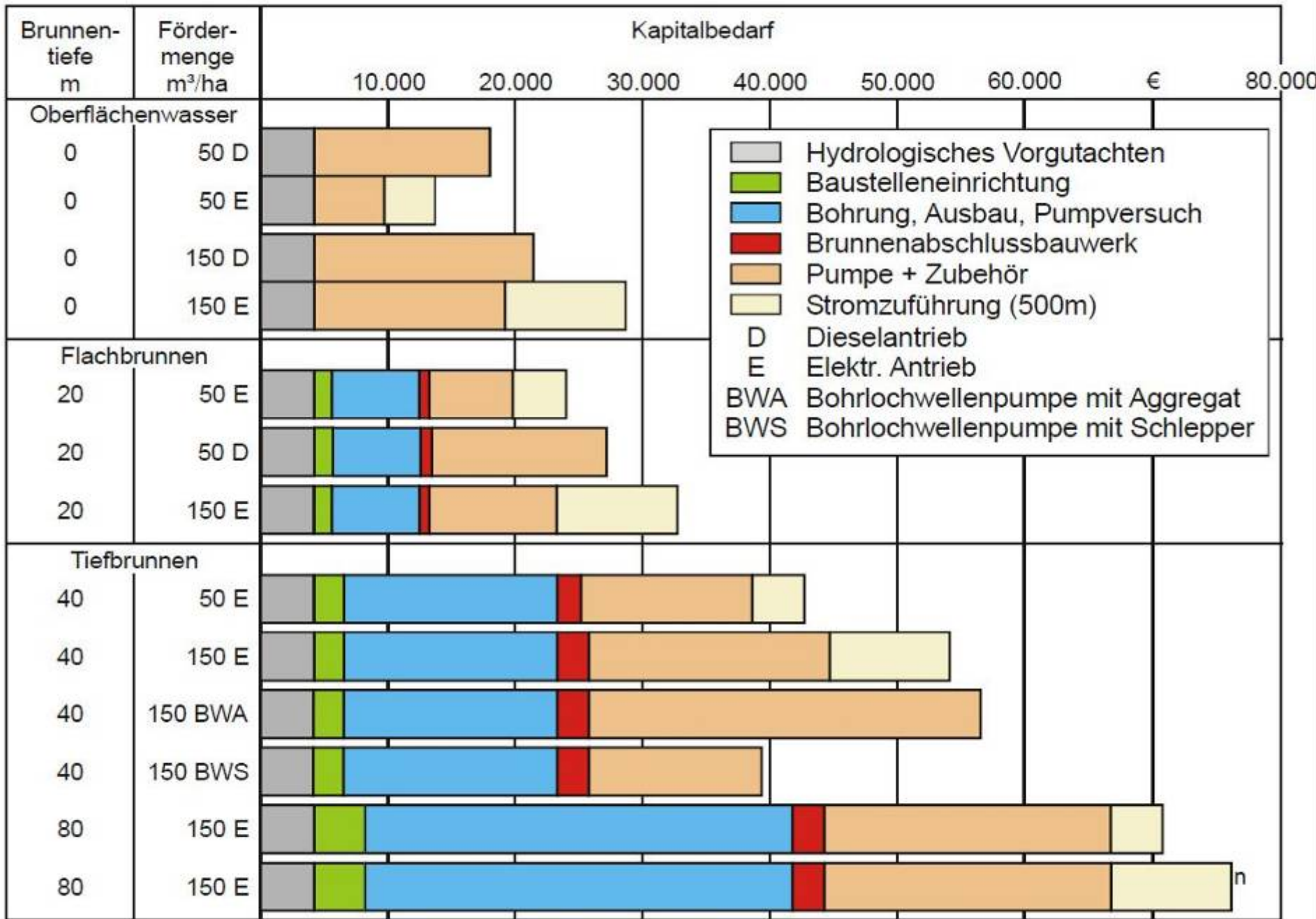












Betriebskosten pro Kubikmeter

