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### "FERTIRRIGATION" FAMIDAN - GOLF COURSES RIA AND CIMA

**Case Study:** Quinta da Ria and Quinta de Cima, Cacela, Algarve, Portugal

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(For further info on reduction of fertilizers in soil and lakes, see Algarve's University study. On request)

#### 1 - Description of the installation.

Golf Courses Ria and Cima represent +/- 250 acres of irrigated soils and are implanted since 2002, on a clayed soil with a high capacity of water retention and low infiltration.

Both courses are situated in a nature reserve zone, within Ria Formosa Natural Park, and therefore extra caution related to the water use and fertilizers was needed.

The climate is Mediterranean with Atlantic influences.

The grasses are: 187 acres of *Agrostis stolonífera*, var. Crenshaw and 63 acres of *Festuca Arundinácea*, var. Tomahawk.

After the preliminary studies of the technical characteristics of the soils, irrigation system, pumping system of the initial project, correct and complementary measures were implanted for the right functioning of the Famidan fertirrigation system for a flow of 540m<sup>3</sup>/hour, with the application of the fertilizers and the simultaneous correction of the PH level.

On the 10<sup>th</sup> of March 2003 the Fertirrigation system started to work on both courses and results were amazing.

## **2 – Disadvantages of the fertirrigation system**

- Requires an extra initial investment (amortized in less than one year)
- The equipments maintenance.
- Qualified personnel

## **3 - The advantages of the Fertirrigation system:**

### **A - Agronomical, chemical and phitosanitarries.**

- Analytical knowledge of: irrigation water, drainage, foliage and soils.
- Reduction of the number of mechanical interventions and repairing; decrease of the number of the annual cuts, "verticuts", soil aerification and "top-dressings", etc.
- Constant and progressive decrease of the fertilizers and micro nutrients, compared to the regular doses. (66% reduction after 2 years)
- Specific nutritive contributions, suitable for each season and "à la carte", with sustained vegetal development on every stage of the growing process.
- Maximum availability of the macro and micro nutrients supported by the soils PH level.

- Balanced growing process of the grasses, through the year without any “blooming explosions”.
- Vegetation with better colouring and analytical results of a normal leaves growth, which confirms the good nutrition and the sanitary conditions.
- Reduction of the water leaching through the soils. Better water rate efficiency.
- Reduction of the vegetation in the lakes.
- Improvement of the physical structure of the soils and consequent drainage, as well as reduction of machinery interference.
- Reduced annual water consumption. (30% less)
- Fewer tendencies to diseases.
- Reduction of phytosanitary treatments

## **B – Economical**

- Reduction of 2/3 of the annual quantities of the fertilizers, (regular grain or liquid) applied directly to soils.
- Reduction of the annual cuts (50%), “verticuts” (50%) and “top-dressing” (50%).
- Reduction of soil aerification needs (50%)
- Reduction of the mechanical interventions allowing more availability of the courses for play.
- Reduction of water consumption (by 30% in 2005, a very dry year).
- Reduction of 33 % of phytosanitary products.

**The above in A and B represents:**

- **Reduction of 10 employees of the maintenance division (from 34 at the beginning of the year to 24).**
- **Savings of 200.000 €/year in labour and purchase of fertilizers.**
- **50% reduction on the machinery park.**
- **Reduction of the spontaneous vegetation in the lakes (less nitrates and phosphates)**
- **Improvement of the permeability of the soil.**
- **Improvement on the vegetation of the courses.**
- **Improvement of the sanitary condition.**
- **More days available for play.**

***Total estimated benefit per year for 1 Golf Course €145.000***

**C – Advantages for the Environment:**

- **53% less usage of fertilizer units.**

This alone represents reductions of:

82% less Tons of CO2 emissions (\*) and 2.570 less consumption of KWh/yearly and therefore 50% less consumption of (MJ fossil fuels)

- **30% of the normal water consumption**

(\*) based on the graphics below and on the data available separately, provided on request.

