# **EVALUATION OF THE VEGSYST-DSS MODEL IN** COMMERCIAL TOMATO AND PEPPER FARMS

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Fondo Europeo de Desarrollo Regional Una manera de hacer Europa







## Nitrogen vulnerables zones







- Environmental problems(Directiva 91/676/CEE)

Vulnerable areas : >50 mg/l

#### **200 UF N/ha**

320 UF N/ha

Recurso interpuesto el 50 de agesto de 2022 — Comisión Europea/Reino de España

(Amete C-576/22) (2022/C 418/18)

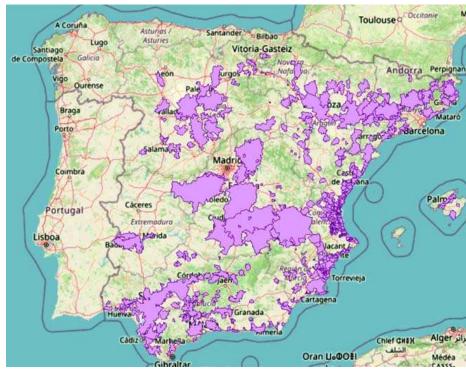
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Demandante: Comisión Europea (representantes: C. Hermos y E. Sanfrutos Cano, agentes

**FU lawsuit** 

Dengadağır Retro de Ferrata

 Oue se doclaré que, en la medida que no ha designales como nonse valuentable a los mitunos, en Cartilla y Leits Entremalum, Galicia, blas fialcares, blas Caracias, Madrid y Comunidad Valenciams, las conas de captación perescorrenta luguas superficiales) o por infilmación (aguas sufrerniosas) relevantes para cada uno de los puetos de medición contaminados identificados en la demanda; al no haber previsto en los programas de acción de Aragón, Cartile la Macha, Cartile y Lein, Errymadon y Malnd rada las molidas obligatorias recourtas, y al no baber adoptado las modidas adicionales o acationes refermalas en la relativa a la astrofanción, con relación a todo el país, y en la que se refiere a la contaminación por retratos, con relación con las Comunidades autórnomes que muestran tendencias al alta en la contaminación de los puntos de medición de las ZVN, en particular Aragón, Castilla-La Mandia, Castilla y León y Muscia, el Reiso de Espalla ha incumplido las obligaciones que le incumben en virtual del articolo 3 aparrado 4, y del articolo 3, aparrados 4 ficido en relación con los amesos (I y III) y 5 de la Divertou 91/674/CRE/) del Consejo, de 12 de diciembre de 1991, relativa a la pressoción de las aguas contra la consumiración producida por nitratos utilizados en la agricultura.



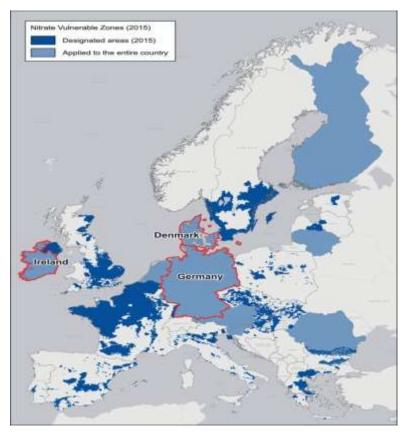


#### Nitrogen vulnerables zones













It sets a target to reduce nutrient losses by at least half by 2030, without deteriorating soil fertility, which will reduce fertiliser use by at least 20% by 2030.

Restore freshwater ecosystems and the natural functions of rivers, in line with the Water Framework Directive. Encourage the reduction of fertiliser use by at least 20%.



### Spanish new regulation





New Spanish regulations on the sustainable use of nutrition



#### **BOLETÍN OFICIAL DEL ESTADO**



Núm. 312

Jueves 29 de diciembre de 2022

Sec. I. Pág. 188873

#### I. DISPOSICIONES GENERALES

MINISTERIO DE LA PRESIDENCIA. RELACIONES CON LAS CORTES Y MEMORIA DEMOCRATICA

Real Decreto 1051/2022, de 27 de diciembre, por el que se establecen normas para la nutrición sostenible en los suelos agrarios.

#### Fertilisation advisor

Calculating the nutrient requirements of a crop

#### **Nitrogen Balance**

"Nitrogen programs may be used, are officially recognised by the competent authorities of the Autonomous Communitie

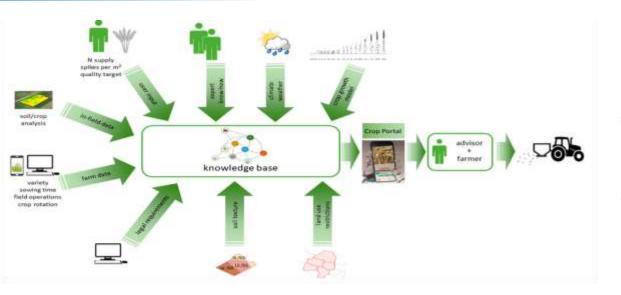
#### **CONTEXT**

#### Nitrogen programs available



































**CALCULATORS** 

## **VegSyst-DSS**

















## **VegSyst-DSS Greenhouse**

- **✓** Eggplant
- **✓** Courgette
- ✓ Melon
- ✓ Cucumber
- **✓** Pepper
- **✓** Tomato
- ✓ Watermelon



# **VegSyst-DSS Outdoor**



- ✓ Cauliflower
- **✓** Spinach
- ✓ Lectuce
- **✓ Processing Pepper**
- **✓** Processing tomato







### **VegSyst-DSS**







#### VegSyst-DSS SUITE

Acceso	
Reconfar contraveña  Mostrar-contraveña	
ENTITIVE	
NUEVO USMARIO	



Desarratio del sistemo de apula o la tuma de destames WegOys I-ISS en entuma web para al manejo del nega y el minisperio en cultivos hari formes y el calcula de la hanha de Carbono y Minisperio.

























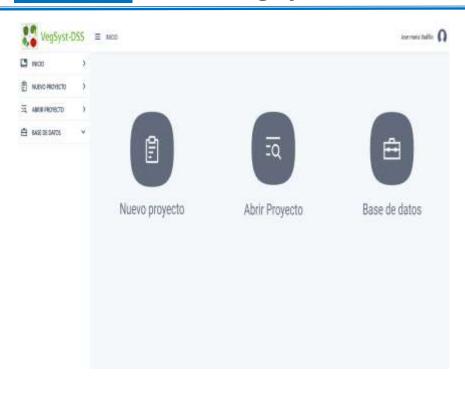


### **VegSyst-DSS**

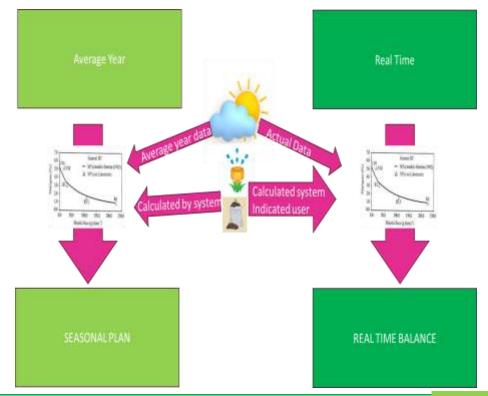








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For the model to estimate the amount of N, it requires few input variables readily available to farmers: soil texture, initial soil N, organic matter, manure application, bottom dressing, dripper flow rate and N content in irrigation water.

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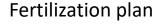
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#### **VegSyst-DSS**

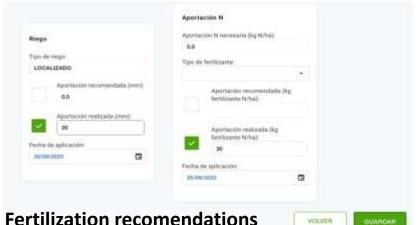












#### **Fertilization recomendations**









# VegSystUP





# Prueba de concepto PDC 2022-133936-100

TÍTULO: Valorización del VegSyst-DSS como herramienta para gestión del riego y fertilización en explotaciones hortícolas al aire libre

**OBJECTIVE:** Development of the VegSyst-DSS system for application in commercial plots in outdoor horticultural crops as an accessible tool for farmers and technicians to facilitate better use of irrigation water and nitrogen fertilisation in irrigation.

#### **Demonstration trial**







#### Test plot data

In 2022, 2 trials were development in processing tomato and pepper

In 2023,

13 commercial processing tomato farms

3 comercial processing peper farms All farms located in Vegas del Guadiana,

the main production area of this crop in Extremadura, were selected.

**Treatments** 

VegsystDSS (N2): Management according to VegsystDSS recommendations

**Farmer (N1):** Traditionally manages irrigation

Non Nitrogen (N0): Without Nitrogen aplication

#### **Treatments**

**VegsystDSS:** Management according to VegsystDSS recommendations

**Farmer:** Traditionally manages irrigation

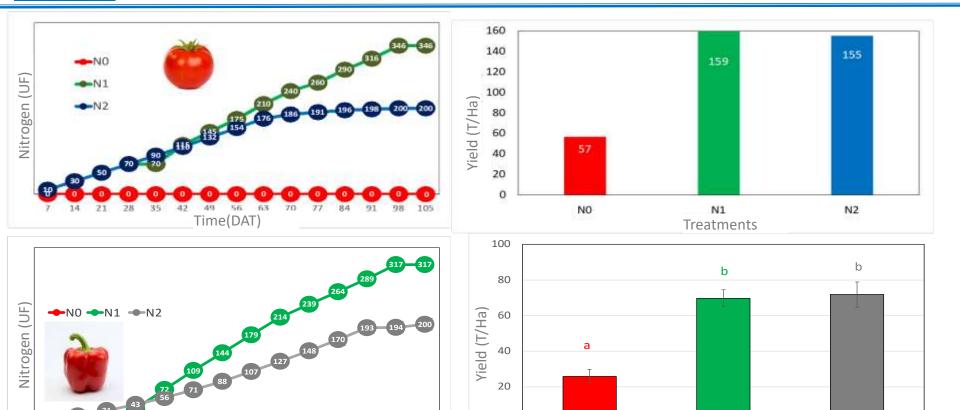
## **RESULTS**

#### Test plot data 2022









0

N0

35

Time(DAT)

N1

**Treatments** 

N2

#### Test plot data 2023

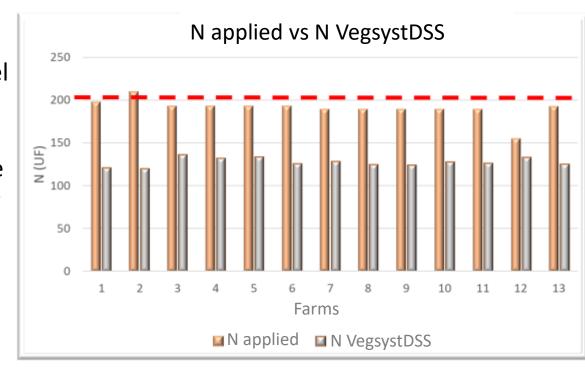






The Fertiliser Units (FU) of nitrogen estimated by the model indicated a reduction of 60 FU compared to that applied with the farmers' fertiliser plan in the different commercial processing tomato plots.

The red line indicates the maximum UF allowed for the cultivation of processing tomatoes.



Actual UF of applied N and those estimated by the VegSyst model

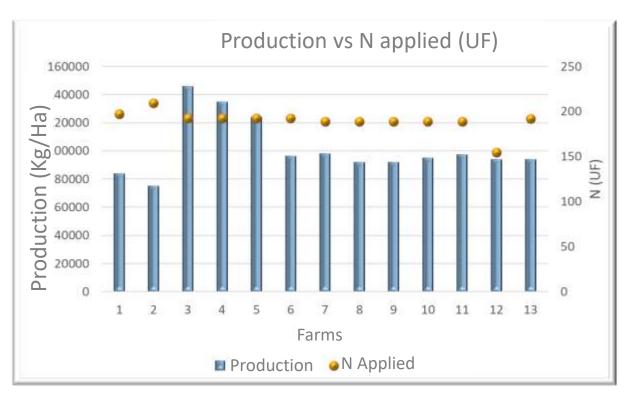






There was no relationship between production and the amount of N applied.



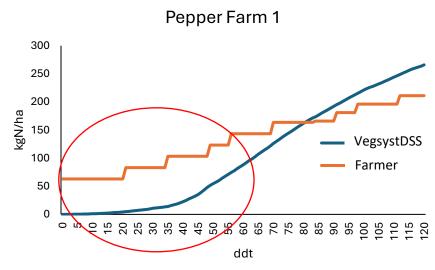


#### Test plot data 2023

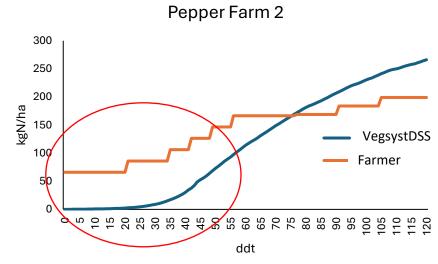


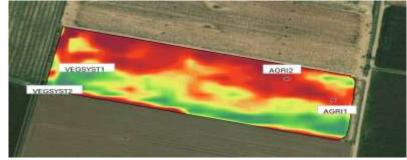






The VegsystDSS System indicates less fertiliser application in the early stages of the crop due to lower biomass. The farmer reduces fertilisation at the time of highest biomass content.











The results obtained in the 2022 plots highlight the importance of nitrogen fertilization to achieve high yields, but also the need to adjust fertilizer application to crop conditions to avoid excess fertilizer application without increasing yield or quality. In the case of both industrial tomatoes and peppers, maximum yields were obtained with nitrogen applications lower than 30% of the usual practices.

In 2023 the data showed that the adoption of VegSyst-DSS for the development and monitoring of the fertiliser plan in industrial tomato would result in a 32% reduction in N application compared to current practices on the commercial farms under study.

In pepper, when farmers received lower doses of fertilizer, they did not follow the recommendations and continued their usual practice for fear of reducing yields and stopped giving us the contributions. It is important to continue with a greater transfer of the benefits of nitrogen reduction.

IN ALL CASES. The Vegsyst-DSS model made it possible to reduce fertiliser application by adjusting the doses according to the analysis of the different nitrogen sources, without reducing crop productivity

# Thank you for your attention

Este trabajo forma parte del, Proyecto PDC2022-133936-100, Proyecto TED2021-131237B-C22 y Proyecto Sectorial AGROS 2022, financiados por los Fondos Europeos de Desarrollo Regional

https://vegsystdss.es/web/



VegsystUP project









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