Smartphone Technology for Managing Urban and Agricultural Irrigation

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Introduction

Fresh water supplies shortages are increasingly common in the Southeast of United States. The growing population in this region has been suggested as a key component contributing to this water stress (Seagar et al. 2009). Being agriculture a significant user of water supplies, it is essential a better management on irrigation schedule for achieving more efficiency on water resource usage. The main objective of this project is to develop irrigation scheduling applications for strawberry, citrus, and cotton, as well as urban lawns, that will be readily available to users in mobile phones with internet access.

Web tools for irrigation schedule

Currently FAWN provides web irrigation schedule tools for agriculture and urban use, these tools, can be accessed at http://fawn.ifas.ufl.edu/. As common goal, the use of smartphone based apps (iOS and Android) may improve the usability of these tools by producers, allowing them to have access of these informations without the need of a conventional computer.

The screen shot bellow shows the use of FAWN's Strawberry Irrigation Scheduler tool and the results it returns to the user.
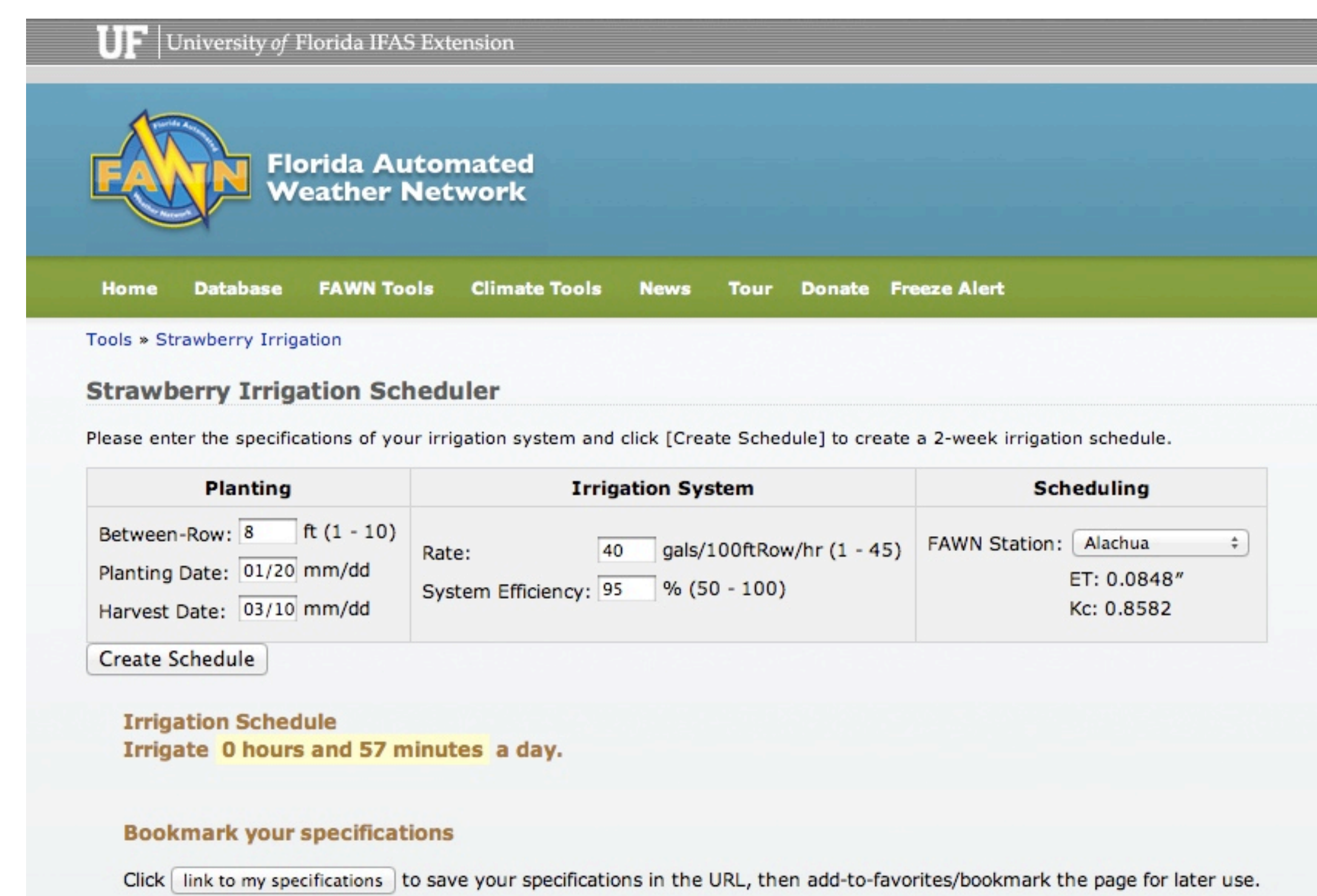
Screen shot of FAWN's Strawberry Irrigation Scheduler tool.

Mobile AgroClimate

AgroClimate (Fraisse et al., 2006) already offers web mobile-based apps for tools like the Strawberry Advisory System, Degree Days and Chill Hours Calculators. These tools have been well received by producers in Florida and indicate that there is an opportunity to expand our mobile-based system. The screen shots bellow are examples of web mobile tools available at www.agroclimate.org/mobile.
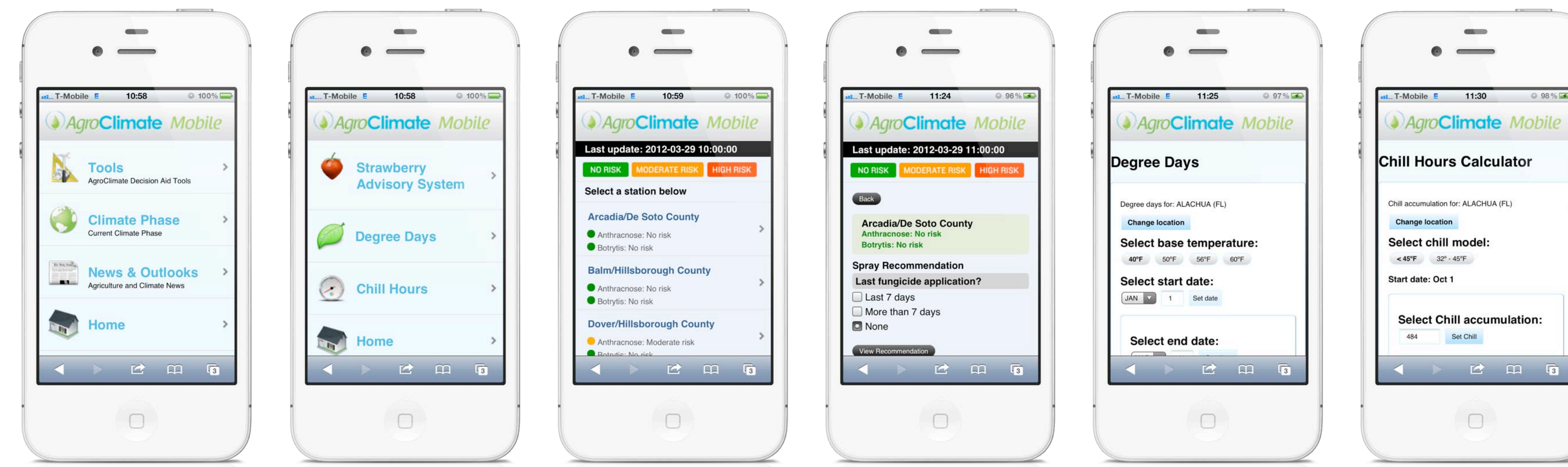
| Home page of AgroClimate web mobile tools. | Tool access menu. | Strawberry Advisory System web mobile tool version. | Strawberry Advisory System user information requests. | Degree Days web mobile tool version. | Chill hours Calculator web mobile tool version. |

This new project aims at developing native applications for devices with operational systems iOS and Android to be made available through their official stores (AppStore and Google Play, respectively). The main purpose of the proposed apps is to help with strawberry, citrus, cotton and urban lawn irrigation management. By building native apps the tools can make use of technology benefits that will improve the user experience and usability. With smartphone apps producers will have easy and anytime access to these tools through their handheld devices. The figure bellow shows a prototype developed for this project and shows an initial layout for displaying and entering information into the system.
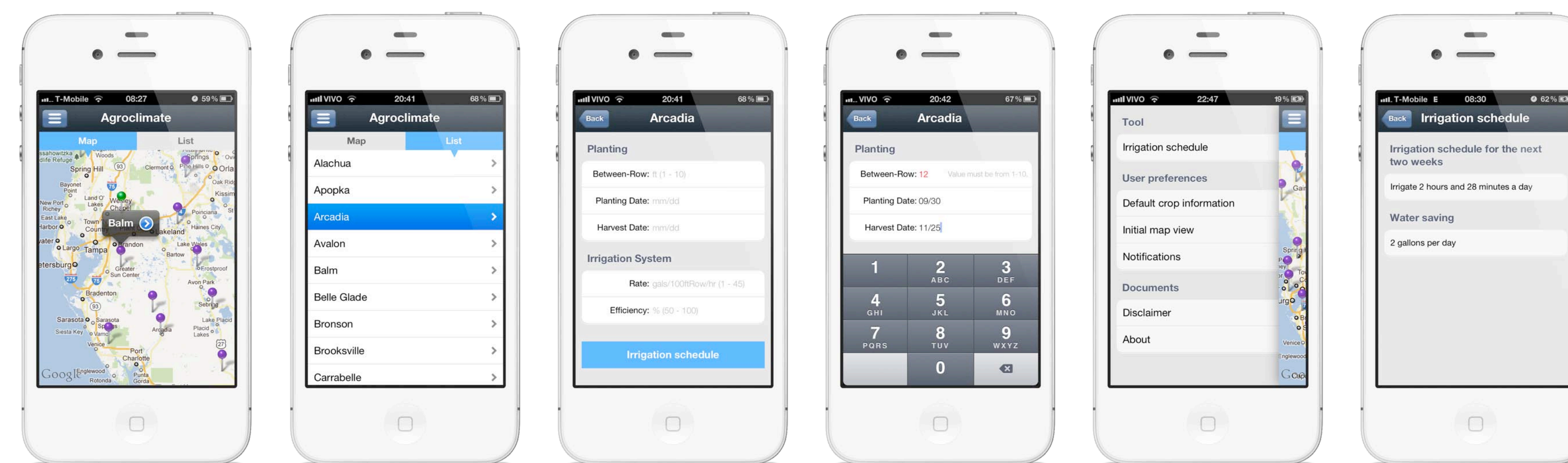
| Map view with geo-located stations presented. | Sorted station list for easy reference. | Input data screen. | Inputing data with real-time validation. | Menu for user preferences and other screen access. | Irrigation schedule results with water saving amount. |

Additional improvements can be done when using the built-in Push Notification System of the smartphones' operational system. These notifications can be customized according to the needs of the producer and since they use just internet connection to be sent, Push Notifications don't have costs, unlike cellular text messages used today.

With Smartphones becoming increasingly popular, it is a natural evolution that agriculture support tools are also becoming available through Smartphones' apps.

Additional Possibilities

With native mobile apps development it is possible to expand their structure to also cover tablets. In this way, one single app can either run on a smartphone or tablet without the need to create two different apps. The figure bellow shows the same prototype now running on an Apple iPad.
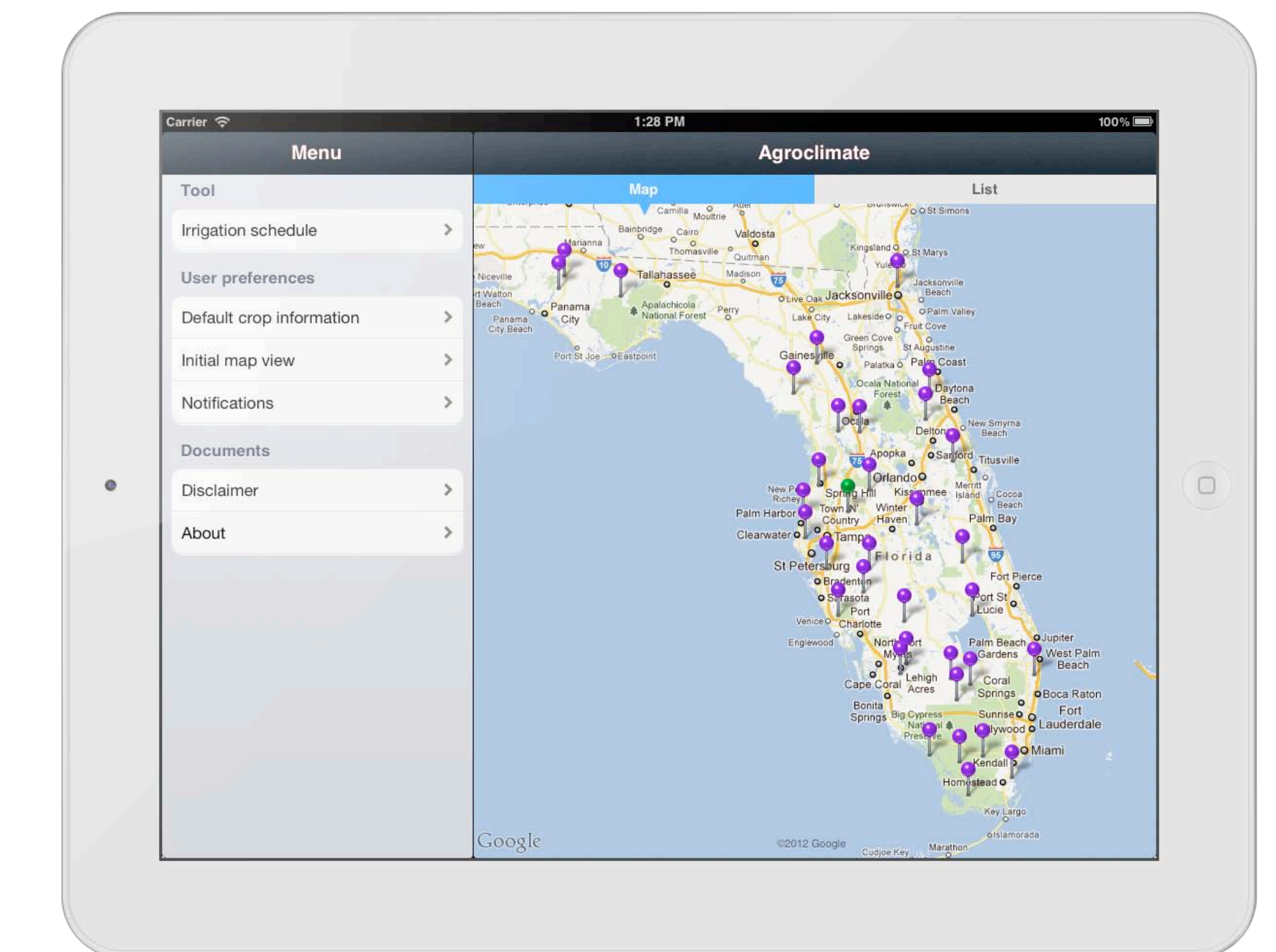
Tablet version of the mobile irrigation tool prototype, structure adjustments were made for better use in larger screens

References

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Fraisse, C.W., Breuer, N.E., Zierden, D., Bellow, J.G., Paz, J., Cabrera, V.E., Garcia y Garcia, A., Ingram, K.T., Hatch, U., Hoogenboom, G., Jones, J.W., and O'Brien, J.J. 2006. AgClimate: A climate forecast information system for agricultural risk management in the southeastern USA. Computers and Electronics in Agriculture 53 (1): 13-27. (ISSN 0168-1699, DOI: 10.1016/j.compag.2006.03.002).

Southeast Climate Consortium

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