

Report: Development of High-Quality Spanish Extension Publications for Diagnosis and Management of Strawberry Diseases (2023)

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Extension Objectives

1. To conduct focus group meetings with extension professionals to identify priority needs and discuss the development of high-quality Extension Publications for Spanish-speaking audiences.
2. To develop a minimum of 10 Extension Publications in Spanish with high-quality color photographs of symptoms and pathogen structures associated with strawberry diseases for Spanish-speaking audiences.

Justification and Description

In the Southeastern region of the United States (SE-USA), a total area of 11,645 acres is used for strawberry winter production generating an income higher than \$300 million annually, which makes the region one of the biggest producers of strawberries in the USA after California (USDA-NASS, 2020). However, biotic factors such as fungal pathogens, nematodes, and weeds limit strawberry production in the SE-USA (Louws & Cline, 2022).

There are already high-quality English extension publications for the diagnosis and management of strawberry diseases in multiple programs in the SE-USA (Louws & Cline, 2019); however, a significant portion of the workforce involved in strawberry production is made up of Spanish speakers. The most common ethnic group for farmworkers is White (53.2%), followed by Hispanic or Latino (37.6%) (Flores, 2020). Moreover, Spanish-speaking farmers are emerging as an important component of small fruit production in the southeast and seek small fruit publications in their language. The

Spanish-speaking audiences, therefore, perform fundamental activities to produce small fruits and are the first to deal with problems caused by pests as well as their management. Therefore, materials that reduce language barriers, and increase efficacy and safety in the management of these pests are necessary (Menger, Rosecrance, Stallones, & Roman-Muniz, 2016).

The need to develop extension materials in Spanish is essential to educate this important group that is part of the fruit industry. However, there is a lack of appropriate materials for Spanish-speaking audiences. Providing this information in the native language will allow access to research-based resources and their adoption in the production processes on the farm.

Translating material into English using translators is not ideal as it can lead to confusion and difficulty in interpretation (Martinez-Espinoza, Fonseca, & Chance, 2003). For materials to be effective, they need to be developed with the Hispanic audiences in mind. Native Spanish speakers who understand pest management and farming are best suited for this purpose. In addition, high-quality color photographs of symptoms and pathogen structures associated with strawberry diseases for Spanish-speaking audiences will help teach farmers and workers about identification and management. Producing these materials will require more time and resources. Time is needed to identify and establish what the priority areas are and to work with experts in the area who can help develop these materials. However, the quality of the extension tools produced to secure a higher audience engagement will ultimately result in a more effective knowledge transfer.

Results accomplished

Manuscripts in English were taken as templates for the development of extension publication materials in Spanish (<https://diagnosis.ces.ncsu.edu/strawberry/>). After obtaining feedback from NC Extension, we prioritized 11 Extension Publications for Spanish-speaking audiences (<https://andres-sanabria-1990.quarto.pub/enfermedades-de-la-fresa/>)



1. Angular spot - Mancha Angular (<https://andres-sanabria-1990.quarto.pub/mancha-angular-de-la-fresa/>)
2. Crown Anthracnose - Antracnosis de la corona (<https://andres-sanabria-1990.quarto.pub/antracnosc Corona/>)
3. Fruit Anthracnose - Podredumbre de la fruta por antracnosis (<https://andres-sanabria-1990.quarto.pub/antracnosisfruta/>)
4. Black root rot - Pudrición de la raíz negra de la fresa (<https://andres-sanabria-1990.quarto.pub/raiznegra/>)

5. Grey Mold - Moho gris en fresa (<https://andres-sanabria-1990.quarto.pub/mohogris/>)
6. Gnomonia foliar spot - Mancha de la hoja de Gnomonia (<https://andres-sanabria-1990.quarto.pub/gnomonia/>)
7. Leather rot - Pudrición de cuero de la fresa (<https://andres-sanabria-1990.quarto.pub/cuero/>)
8. Phomopsis blight - Tizón de la hoja por Phomopsis (<https://andres-sanabria-1990.quarto.pub/phomopsis/>)
9. Phytophthora crown rot - Pudrición de la corona por Phytophthora (<https://andres-sanabria-1990.quarto.pub/phytophthora/>)
10. Crown grey mold - Moho gris de la corona de fresa (<https://andres-sanabria-1990.quarto.pub/mohogriscorona/>)
11. Anaerobic soil disinfestation - Desinfestacion anaerobica del suelo (<https://andres-sanabria-1990.quarto.pub/das/>)

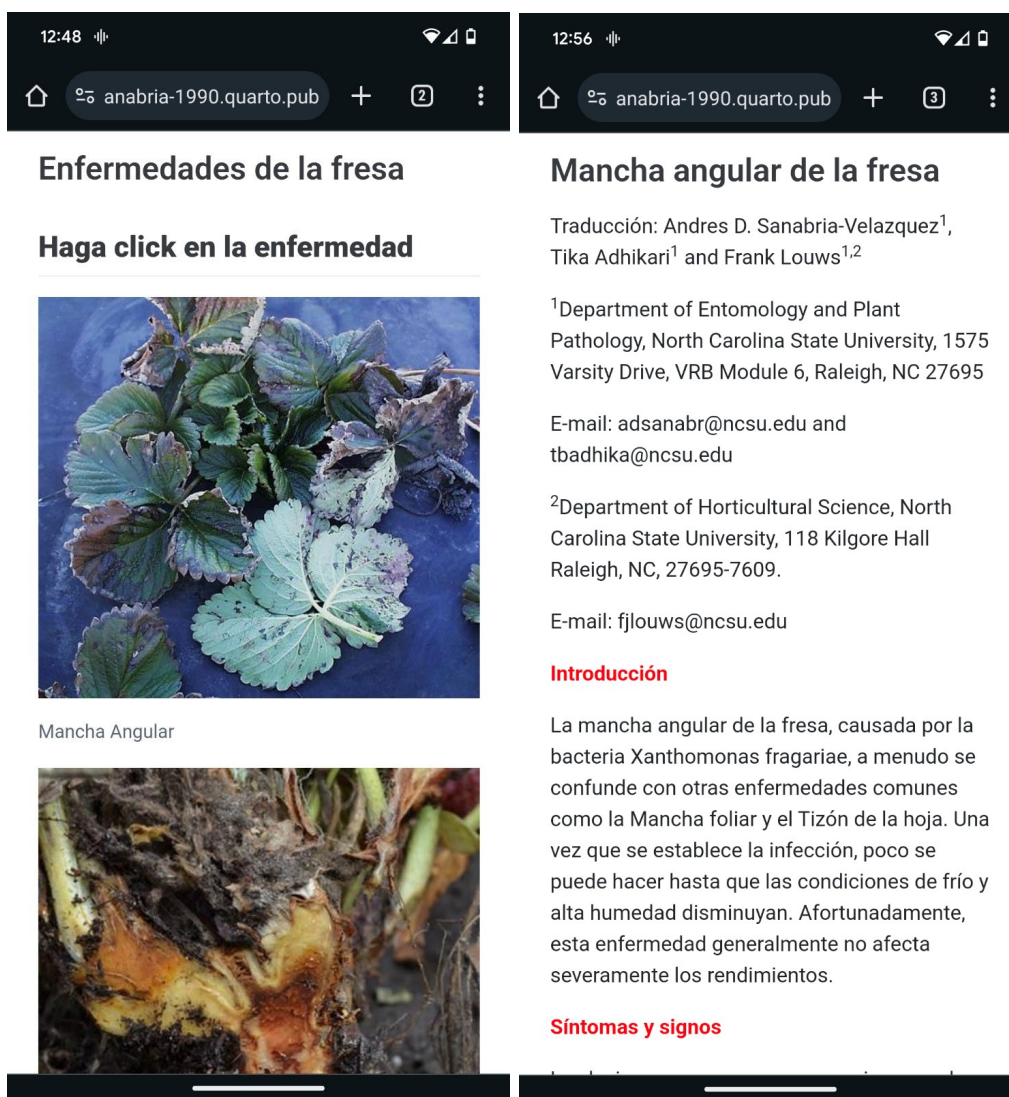


Figure 1. Screenshot of factsheet as visualized in mobile phones.

Additional Work

The factsheets will be integrated into the NC State University extension portal (<https://diagnosis.ces.ncsu.edu/strawberry/>). We also plan to share the results at upcoming professional (e.g., Southern Regional Conferences) and grower meetings (e.g., NC Strawberry Expo) to promote the availability of the documents.

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