

Facilitation of Coexistence: Alfalfa Isolation Management Map & Alfalfa Seed Stewardship Program

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Interactive information can be found through the CCIA

Web site: <http://ccia.ucdavis.edu>

Click on “Members Only - Crop Isolation Mapping”.

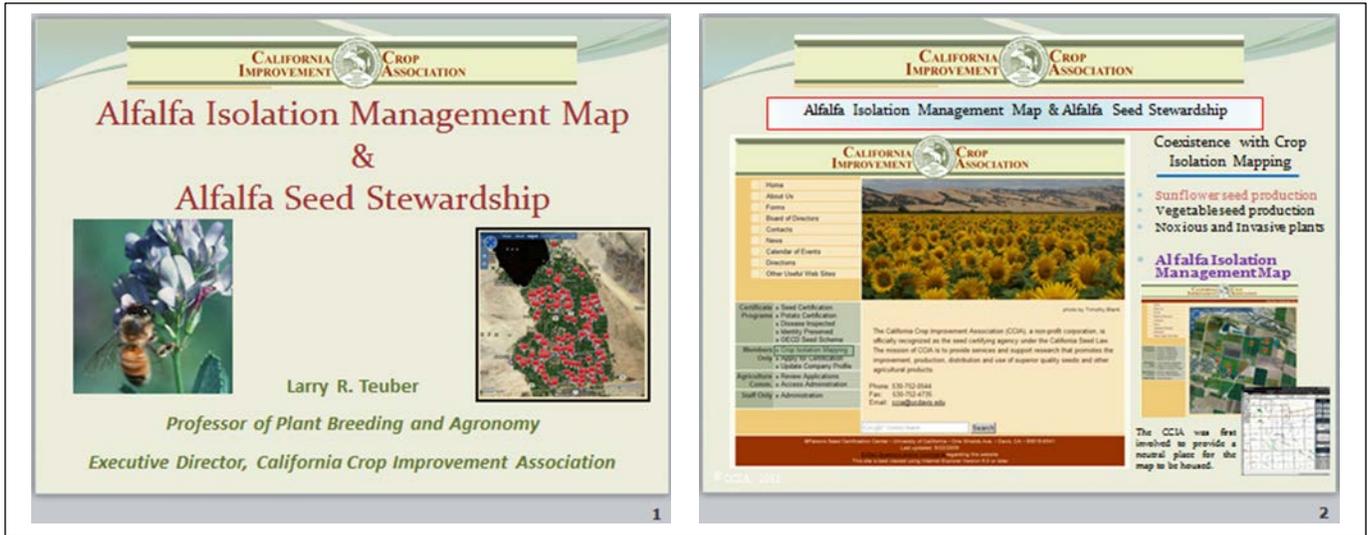
Then click on the link to “Crop Isolation Pinning Map”.

View the tutorial or use the demonstration map.

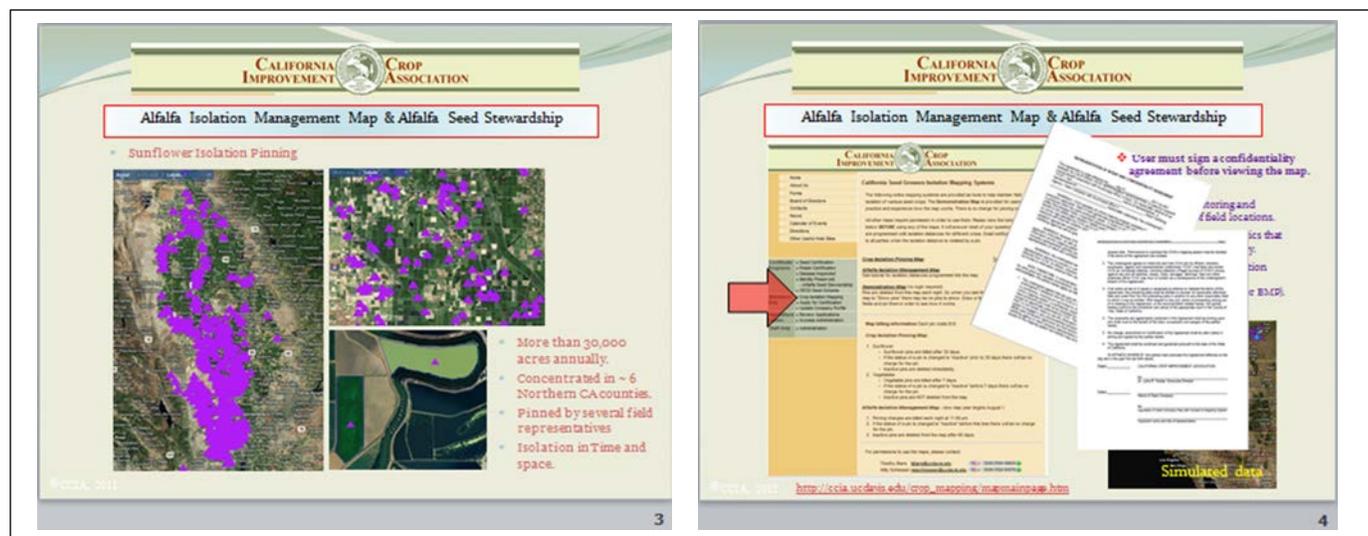
The concept and use of crop isolation mapping was initiated in California in the early 1980's to provide a tool for sunflower production companies to cooperatively monitor isolation requirements for seed certification. In the early years a large paper map of California was housed in the Parsons Seed Certification Center [California Crop Improvement Association (CCIA)]. Representatives from the various sunflower production companies would come together in February of each year and physically place pins in the map to indicate where they intended to plant sunflower seed fields. The industry representatives cooperated in planning their production in order to maximize land availability by achieving isolation by either spatial or temporal separation.

The CCIA developed a computerized map to serve this function in the early 2000's and the “pins” were placed online using a map marked with township, range, and section identifiers. This map had the advantage of being able to be viewed online by everyone at any time. However, those responsible for planning production continued to meet less formally on an annual basis to discuss common needs and concerns and keep up-to-date on changes in the capability of what had become known as the “Pinning Map”. Over time, other parts of the agronomic and vegetable seed industry became interested in the mapping capability and could see utility in managing isolation in their own crops. While the Pinning Map had a great deal of utility it also had shortcomings. Among the shortcomings was that pins were mapped - not actual fields, distances were calculated between pins placed at the approximate center of fields

rather than edges of fields, and there was no way to display selected information about the pinned field.

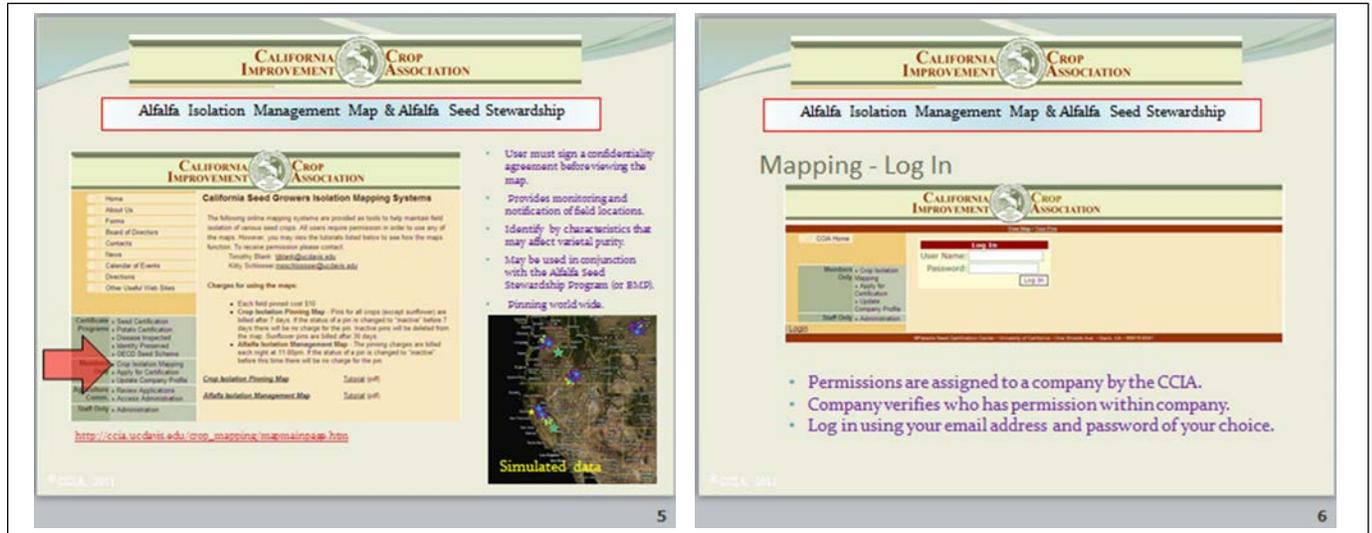


In 2006, the CCIA converted to an internet based system for making applications to produce certified seed. A central core of this data based application process was the use of Microsoft Maps (now Microsoft Bing Maps) to locate and outline actual fields. Microsoft Bing Maps provides a current aerial photo that is automatically updated by Microsoft every few years. This makes it easy to locate an exact field. The perimeter of a specific field can then be circumscribed on the aerial photo and the GPS coordinates associated with that polygon stored in the data base and referenced by computer applications that calculate field size or isolation distance. Between 2006 and 2011, the CCIA continued to develop and expand the capability of its internet based certification software.



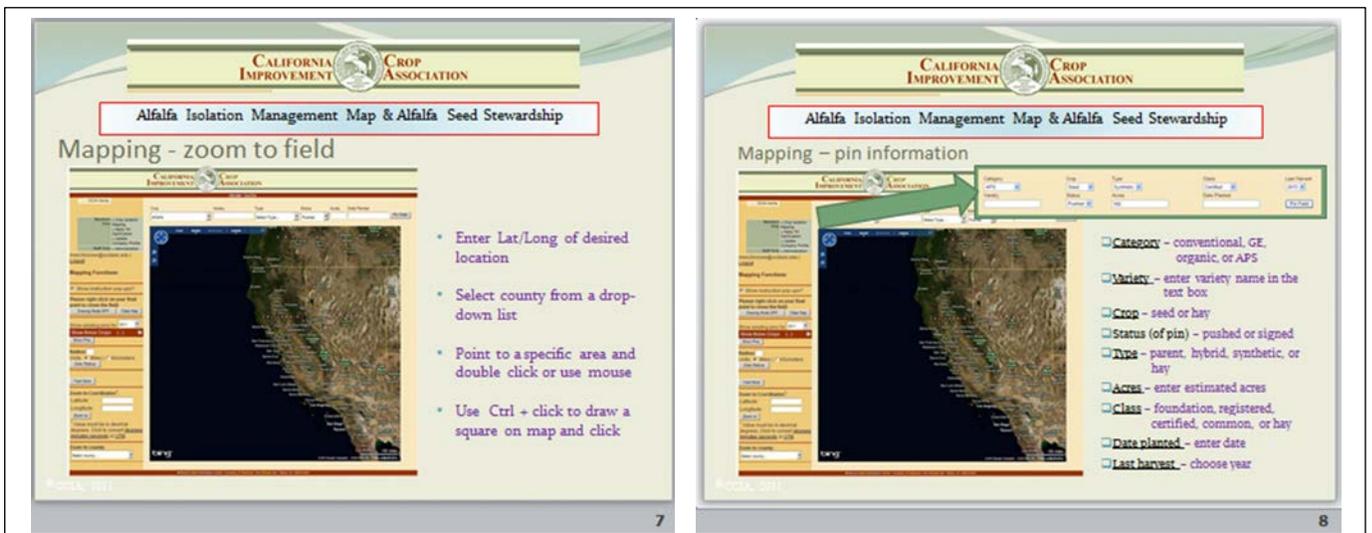
In 2011 the CCIA introduced a new, more powerful, user friendly isolation mapping capability utilizing Microsoft Bing Maps. This addition to our online suite of certification tools restricts user permissions and is made viewable on an individual user basis. Individual crop maps are layered so that, depending on permissions, only one species or multiple species can be viewed at

the same time. An important new attribute was the development of the Alfalfa Isolation Management Map (AIMM). Due to the sensitive nature of the information used in AIMM, access is limited to those who have signed a Confidentiality Agreement that sets forth the

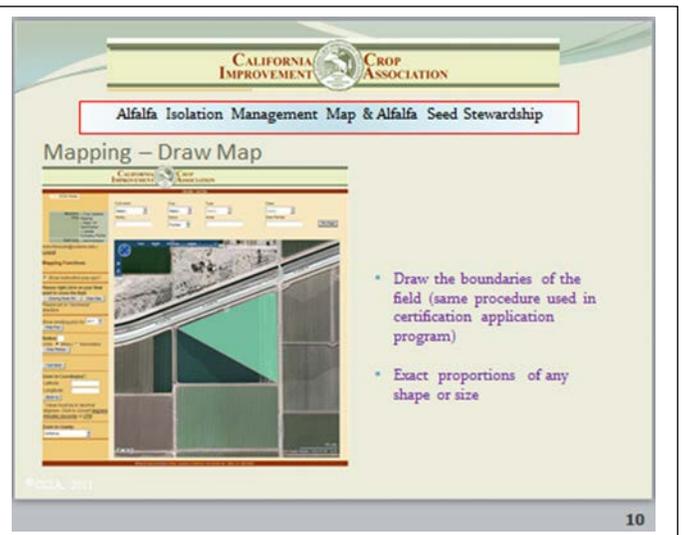


appropriate uses of the map – Using the map for non-competitive purposes will not be tolerated. Permission to use AIMM is verified by the CCIA and is by password only – passwords are individually assigned and may not be shared.

There are multiple ways to begin viewing the pinning map. One can: enter the latitude and longitude if it is known and the program will zoom to that location, select a county (In California only at this time), double click on a portion of the map, to name a few. To begin “pinning” a field one enters specific information regarding planting stock and type of seed that will be produced. This information is used by the AIMM to determine criteria with respect to how the pin will be identified and displayed. Most of the information provided is confidential and is only available to the owner of the pin (shared information is discussed later). Information provided includes: Category of Production (eg. Organic, APS, GE, and Conventional); Variety; Type; Acres: Class of Seed; Date Planted; Date of anticipated Last Harvest. One may at this or a later

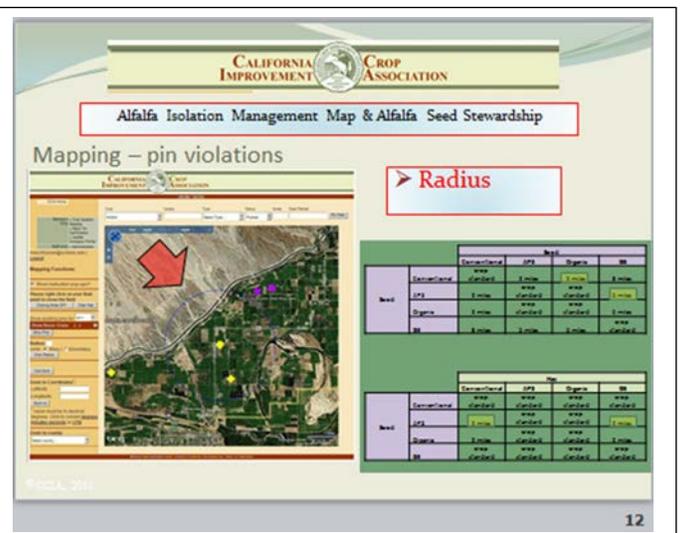
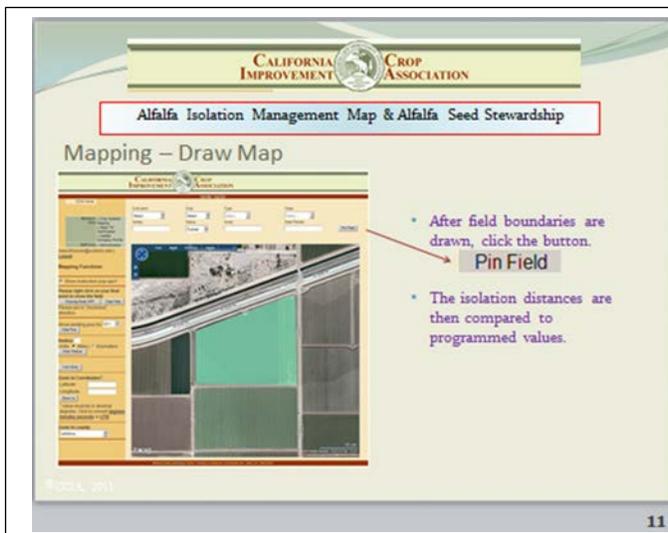


time also enter specific confidential notes. The AIMM displays pinned fields and designated production areas and zones (NAFA). Information that is entered in the confidential “box” will be available to the owner of the pin in the “mouse over” pop-up (discussed later), but not to other map users. To map a field one navigates to the field that is to be mapped (higher magnification is better for accurate mapping). The drawing mode is turned on [there are also on-screen pop-up instructions that can either be toggled (on/off)]. One clicks on the boarder of the field to start tracing the perimeter and continues tracing and clicking to circumscribe the outer edge of the field. By going short distances and clicking one can trace field edges that are very irregular. To close the polygon right click.

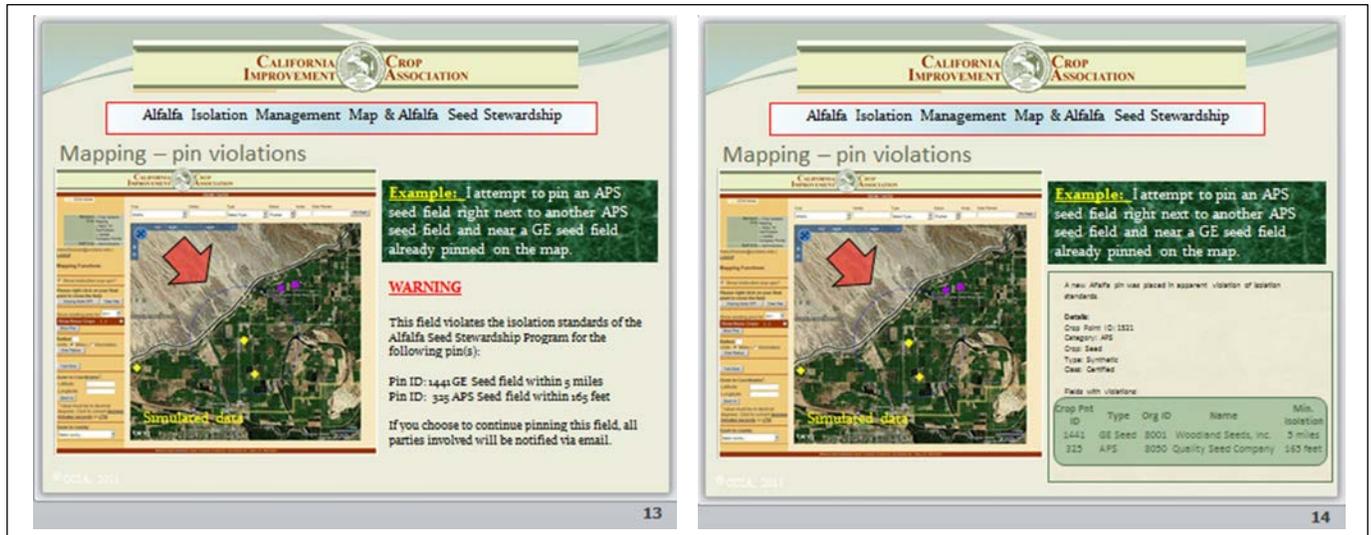


To finish the mapping process it is necessary to click on the “PIN FIELD” button. This button is located in the upper portion in the lower right corner of the field where all the pin information was entered. Once the field is pinned it is displayed and the computer checks the characteristics of the pin, as provided by the user, against the programmed standards for the newly pinned field.

The computer then checks that information against all other neighboring fields and the specific

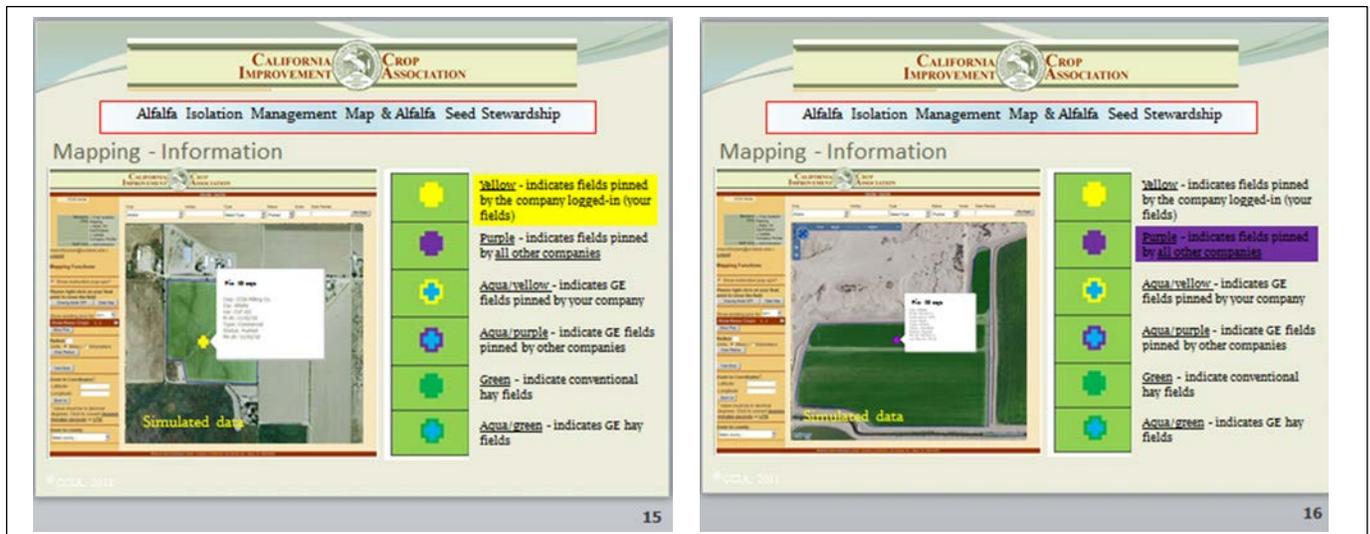


isolation requirements of that field. If there are no violations the pin is accepted. If the new pin violates the isolation requirements of another existing pin the computer displays a warning of the violation and an indication of what pins are in conflict and the basis of the violation (pin identification will be discussed later). At this point, the user can either choose to delete the new pin or continue. If the choice is to continue, the AIMM accepts the pin and sends an e-mail to the user placing the pin, the owner(s) of all pins that are in violated by the new pin, and the CCIA. The computer generated e-mail indicates that a new pin has been placed in violation, the

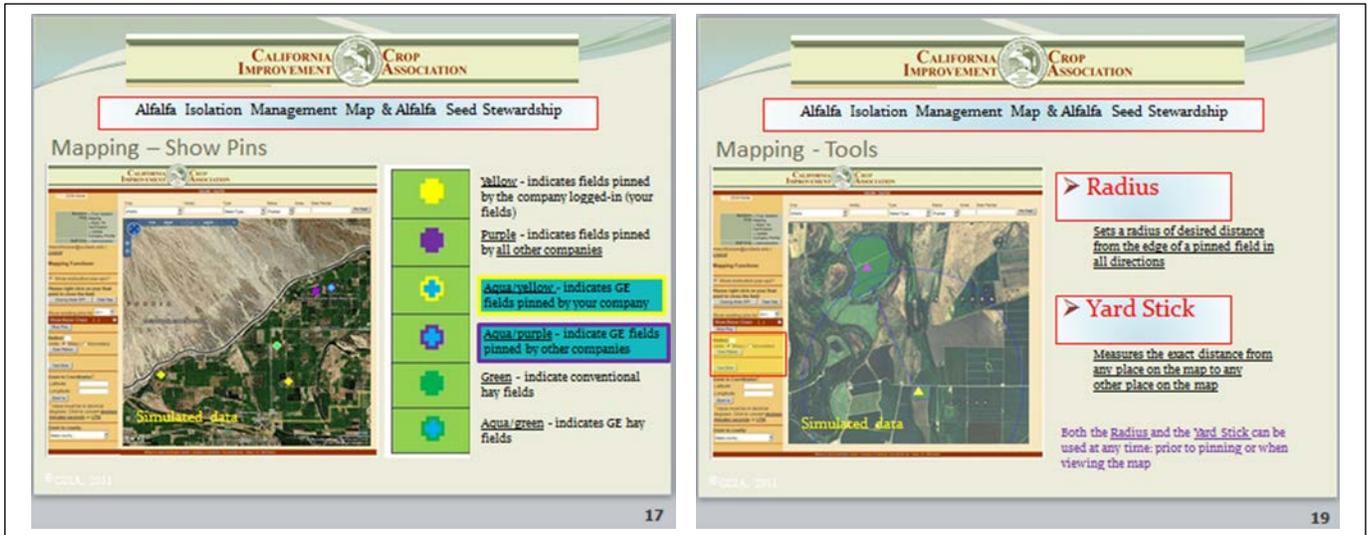


category of the new pin, the pins that are in conflict and the owner of each of the pins that are in conflict. It is incumbent upon the AIMM pin owners to communicate and resolve the pin conflict. The California Crop Improvement Association bears no responsibility for conflict resolution. However, unresolved isolation infringement will result in the seed produced by both parties being ineligible for either certification or Identity Preserved Certificates under the Alfalfa Seed Stewardship Program.

All pins are identified with a unique numeral. This identifier is associated with all actions taken regarding that pin. One can search for a specific field by pin number. Mapped field are

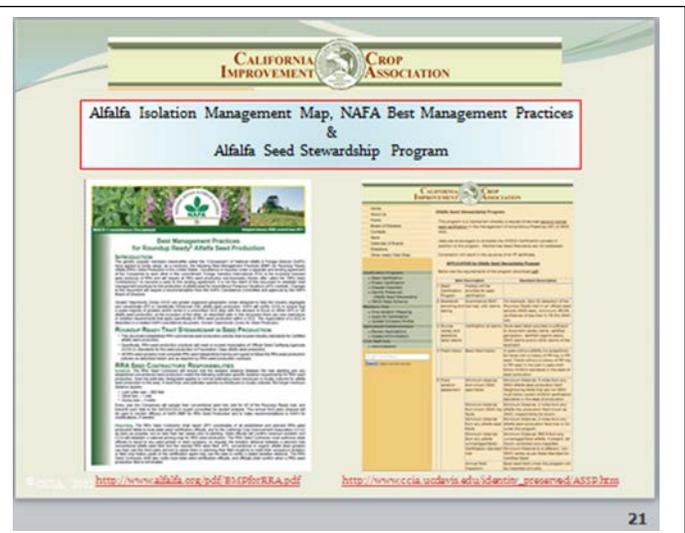
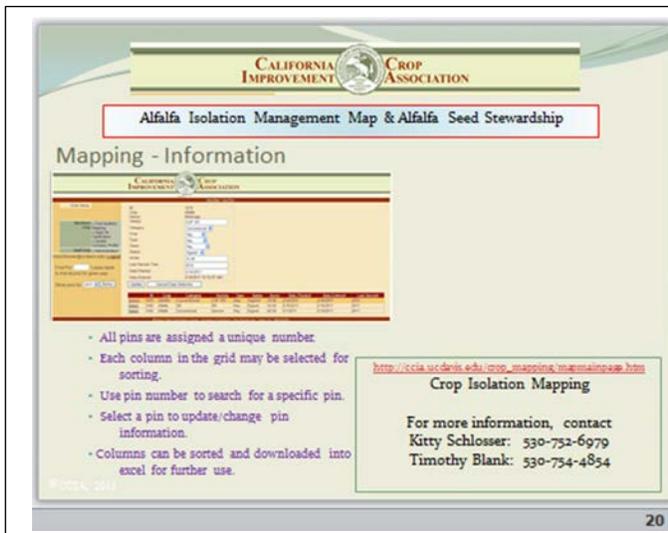


associated with species specific shape and are color coded pins. All alfalfa pins (for those able to view maps for more than one species) are crosses. When viewing that map one may display only pins that they own or they may display all pins. Pins that belong to you are yellow and pins that do not belong to you are purple. By “mousing over” a pin a pop-up appears with information about the pin. If the pin belongs to you, the pop-up information will display the owner of the pin, the Variety Name, Category of Production, Planting Date, Last Harvest Date, and any confidential notes you may have entered. If the pin does not belong to you (the pin is purple), the pop-up will provide Category of Production, Planting Date, and Last Harvest Date it will not



provide the name of the Owner, Cultivar Name, or other confidential information.

Genetically engineered seed or hay pins are aqua in color. Hay fields are crosses with a green boarder. Pins for GE seed fields are bordered by either a yellow or purple to indicate if the pin is yours or belongs to someone else. The AIMM is also programmed with measuring tools that can be utilized to determine the exact distance by which fields or other objects are separated. A radius tool allows one to set a radius around a central point and determine if there are potential



isolation issues at that distance in a 360° circle around the point. The yard stick tool allows one to determine point to point distances. Both of these tools can be used easily and with a great deal of accuracy in exploring potential field locations without the necessity of either pinning the field or physically going to the field to take measurements. The owner of multiple pins can also obtain a report of all the pins from within the AIMM program. Reports can be generated for specific years and sorted for each type of information provided in the application. Reports can also be copied and downloaded into excel for further manipulation.

The California Crop Improvement Association is working continuously with the seed industry to improve and expand the capabilities of the AIMM. We are coordinating with North American Alfalfa and Forage Alliance (NAFA) to map Grower Opportunity Zones, and Non-GE Production Areas and to developing programing to respond to specific isolation requirements throughout the Western United States. We are also coordinating with the Association of Official Seed Certifying Agencies (AOSCA) to continue to set programming decision rules that reflect the needs of the Alfalfa Seed Stewardship Program. In the future applications with the CCIA for certified seed production and applications for the ASSP will be completely linked with the Alfalfa Isolation Management Map. When that capability is implemented applicants for seed certification who wish to also use the AIMM, or conversely, users of the AIMM who wish to apply for either certification or the ASSP will simply access the desired program and enter either their application number or their pin number and the majority of the remaining portions of the application will be populated from existing information in the data base.

