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### Farm Water Quality Planning

A Water Quality and Technical Assistance Program for California Agriculture http://waterquality.ucanr.org

This Reference Sheet is part of the Farm Water Quality Planning (FWQP) series, developed for a short course that provides training for growers of irrigated crops who are interested in implementing water quality protection practices. The short course teaches the basic concepts of watersheds, nonpoint source pollution (NPS), self-assessment techniques, and evaluation techniques. Management goals and practices are presented for a variety of cropping systems.



## Reference:

# **Developing a Farm Map**

**MERILARK PADGETT-JOHNSON** is Viticulture Program Coordinator, Allan Hancock College, Santa Maria, California.

Maps play a useful role in the development and presentation of a farm plan. Much of the farm inventory can be shown on maps. Maps can graphically show the natural and cultural features present on the farm and their spatial relationships.

To develop a farm map, begin with a base map. Aerial, topographic, GIS, or even hand-drawn maps can serve as base maps. Aerial maps show features such as roads, fences, waterways, and vegetation. A common way to add information to a GIS base map is to add transparent layers that show additional features not shown on the base map. GIS is a computer system capable of assembling, storing, manipulating, and displaying geographical information in layers. Following is a list of farm inventory information that can be included in various maps and overlays:

#### **BASE MAP**

Begin by including an information block showing the name and location of the farm, names of the owner and manager, name of the person who developed the map, date of map preparation, and map scale.

A map legend should be included to explain symbols and color schemes used on the map. Conventional map symbols used by USDA Natural Resources Conservation Service are shown in Figure 1.

Property, field, and block boundaries may be shown on the base map or as an overlay.

#### **OVERLAYS**

- The *Boundary Overlay* shows property lines, fence lines, roads, and other features at the discretion of the mapmaker.
- The *Hydrology and Natural Feature Overlay* shows streams, rivers, lakes marshes, estuaries, wetlands, and other water bodies on or adjacent to your farm. This overlay may also include other important natural features such as ridge tops, cliffs, valleys, wildlife habitats or refuges, and other natural features.
- A *Cultural Features Overlay* may include roads, homes, farm headquarters, barns, equipment storage buildings, pesticide storage sheds, irrigation and drainage structures, and any other desired feature.
- A *Planting Overlay* with field number, crop type, acreages, and irrigation setup information is extremely valuable.
- Soils Overlays are helpful for replanting and redevelopment decisions.
- *Monitoring Overlays* show the location of monitoring points used to document conditions and projects on the farm or ranch.
- *Planning Overlays* may be developed to show the locations of planned treatments, cultivation practices, irrigation applications, and future redevelopment.

#### **BOUNDARIES, MARKS**

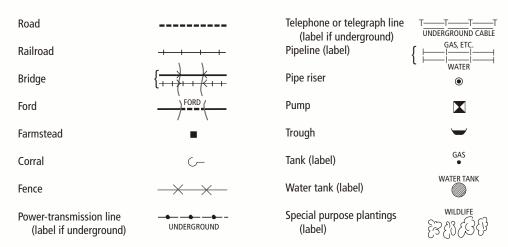
Watershed boundary Soil boundary

Farm or ranch boundary Field number

2

Field or land-use Field acreage 320 ac.

#### **WORKS AND STRUCTURES**



#### **HYDROGRAPHIC FEATURES**

Streambank protection

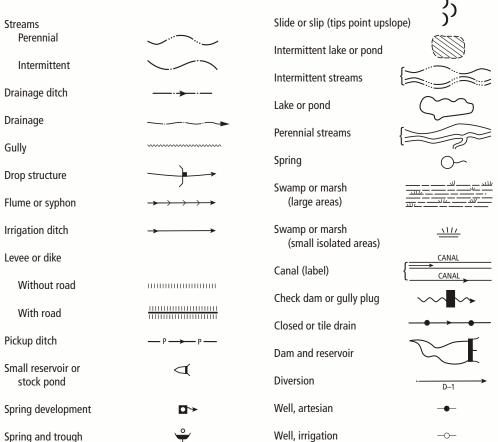


Figure 1. Conventional mapping symbols for conservation plan maps.
(SOURCE: Conventional Mapping Symbols for Conservation Plan Maps USDA—SCS Portland, Oregon.

1965. Publication # M-3534)

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### **DEVELOPING OVERLAYS**

Overlays are easy to develop for hardcopy maps. Sheets of acetate or other transparent material are placed over the base map. Tick marks are placed on the overlay, marking the corners or other locations on the base map so that the overlay can always be returned to its proper geographic location. It is helpful to tape the base map and overlay to your work surface. Be sure to use tape that will come off easily without damaging the overlay or map. Once the overlay sheet is "geo-located" you are ready to start drawing features on the overlay. Initially, you may want to use erasable ink pens so that you can easily correct any errors. Once you are satisfied with the overlay, you can redo it using permanent ink.

You can also use computers to make maps and incorporate overlay information. With the use of Global Positioning Systems (GPS) and GIS software, computers can do the overlay work described above. Private consulting firms that have GPS and GIS technology can provide these services for the individual grower.

#### **ESTIMATING AREA**

You may need to estimate the area in a block, several blocks, or your entire farm. A common means of estimating area is to use an acreage-calculating dot grid. To use a dot grid, first you determine the number of dots in a known area (for example, 25 dots = 5 acres). Then you count the dots in an area of unknown size and use the number of dots to calculate the number of acres. If you know the scale of your map, you can also use the tables that often accompany dot grids.

#### **REFERENCE**

George, M. R. 1996. Rangeland watershed program water quality planning guide No. 3: Developing a ranch map. Davis: University of California, Department of Agronomy and Range Science.

#### FOR MORE INFORMATION

You'll find detailed information on many aspects of field crop production and resource conservation in these titles and in other publications, slide sets, CD-ROMs, and videos from UC ANR:

Nutrients and Water Quality, slide set 90/104 Protecting Groundwater Quality in Citrus Production, publication 21521 Sediments and Water Quality, slide set 91/102

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University of California Agriculture and Natural Resources Communication Services 6701 San Pablo Avenue, 2nd Floor Oakland, California 94608-1239

Telephone: (800) 994-8849 or (510) 642-2431

FAX: (510) 643-5470

E-mail inquiries: danrcs@ucdavis.edu

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