this soil in mapping are small areas of Egbert silty clay loam and Sacramento clay.

The water table in this poorly drained soil has been lowered to about 3 to 4 feet by using drainage ditches and by pumping. Runoff is very slow, and erosion is a slight hazard.

This soil is used mostly for irrigated corn, sugar beets, tomatoes, and grain sorghum. It is also used for barley, wheat, safflower, wildlife habitat, and recreation. Capability unit IIIw–2 (16); not placed in a range site.

Sacramento Series

The Sacramento series consists of nearly level, poorly drained soils in basins. These soils formed in mixed alluvium. Where these soils are not cultivated, the vegetation is annual grasses and forbs. The average annual temperature is 58° to 60° F., the average annual rainfall is 16 to 18 inches, and the frost-free season is 250 to 270 days. Elevation ranges from sea level to 10 feet.

In a representative profile, the surface layer is mottled, gray and dark-gray clay 27 inches thick. The substratum is mottled, light-gray to black, stratified loam to clay that extends to a depth of more than 60 inches.

Permeability is slow. Effective rooting depth is more than 60 inches where these soils are drained. The water table is at a depth of 36 to 48 inches and restricts the roots of most plants.

Sacramento soils are used for irrigated row crops, field crops, dryfarmed field crops, wildlife habitat, and recreation.

Following is a representative profile of Sacramento clay:

Ap—0 to 15 inches, gray (10YR 5/1) clay that has few, fine, faint, pale-brown (10YR 6/3) mottles, very dark gray (10YR 3/1) and has few, fine, faint, brown (7.5YR 5/4) mottles when moist; moderate, fine, medium and coarse, granular structure; extremely hard, firm, sticky, plastic; many medium roots; many very fine interstitial pores; moderately alkaline; clear, smooth boundary.

A11—15 to 24 inches, gray (10YR 5/1) clay that has common, fine, prominent, light yellowish-brown (10YR 6/4) mottles, black (10YR 2/1) and has common, fine, prominent, dark yellowish-brown (10YR 4/4) mottles and common, medium, prominent, yellowish-red (5YR 5/6) concretions when moist; moderate, coarse, prismatic structure; extremely hard, firm, sticky, plastic; common fine roots; many very fine tubular pores and many very fine interstitial pores; moderately alkaline; abrupt, smooth boundary.

A12—24 to 27 inches, dark-gray (10YR 4/1) clay that has many, fine, prominent, light-gray (10YR 6/1) and reddish-brown (2.5YR 5/4) mottles, black (10YR 2/1) and has many, fine, prominent, gray (10YR 5/1) and dark reddish-brown (2.5YR 3/4) mottles when moist; moderate, coarse, prismatic structure; extremely hard, firm, sticky, plastic; few very fine roots; common very fine tubular pores; moderately alkaline; abrupt, smooth boundary.

C—27 to 60 inches, light-gray (5Y 6/1, 10YR 7/2) to black (10YR 2/1), highly stratified loam to clay that has many, fine to medium, prominent, reddish-yellow (7.5YR 6/6), reddish-brown (5YR 5/4), and light olive-gray (5Y 6/2) mottles, gray (5Y 5/1) and grayish brown (10YR 5/2) to black (10YR 2/1) and has many, fine to medium, prominent, strong-brown (7.5YR 5/6), reddish-brown (5YR 4/3), and olive-gray (5Y 5/2) mottles when moist; mostly massive; roots and pores decrease gradually as depth increases; moderately alkaline.

The A horizon ranges from gray to dark gray or grayish brown in color. Mottles are few, fine, faint to many, medium, prominent. Texture is clay or silty clay, reaction is slightly acid to moderately alkaline, and thickness is 10 to 30 inches. Some areas are made up of as much as 20 inches of clay loam overwash material. The C horizon ranges from black, dark gray, or light gray to greenish gray in color and has common to many, medium to large, prominent mottles. The texture is dominantly clay stratified with lenses of loam that is high in content of organic matter. The C horizon is calcareous in places.

Sacramento silty clay loam (Sa).—This soil has a profile similar to the one described as representative for the series, except that it has grayish-brown silty clay loam overwash material on the surface. This material is as much as 20 inches thick. Included with this soil in mapping are small areas of Sacramento clay and Egbert silty clay loam.

The drainage of this poorly drained soil has been improved by use of open drainage ditches and levees so that the water table remains below a depth of 36 inches. Runoff is slow, and erosion is a slight hazard. The available water capacity is 9 to 11 inches.

This soil is used mostly for irrigated sugar beets, tomatoes, beans, and grain sorghum. It is also used for dryfarmed small grain and safflower, wildlife habitat, and recreation. Capability unit IIIw–3 (17); not placed in a range site.

Sacramento silty clay loam, occasionally flooded (Sc).—This soil has a profile similar to the one described as representative for the series, except that it has grayish-brown silty clay loam overwash material on the surface. This material is as much as 20 inches thick. This soil is subject to flooding at least 1 year in 3, and the flooding lasts more than 48 hours. Included with this soil in mapping are small areas of Egbert silty clay loam, flooded.

The drainage of this poorly drained soil has been improved by use of open drainage ditches and levees so that the water table remains below a depth of 36 inches. Runoff is very slow, and erosion is a slight hazard. The available water capacity is 9 to 11 inches.

This soil is used mostly for irrigated beans, tomatoes, grain sorghum, and sugar beets. It is also used for dryfarmed safflower and small grain, wildlife habitat, and recreation. Capability unit IVw–3 (17); not placed in a range site.

Sacramento clay (Sd).—This soil has the profile described as representative for the series. Included with this soil in mapping are small areas of Clear Lake clay, Egbert silty clay loam, and Ryde clay loam.

The drainage of this poorly drained soil has been improved by use of open drainage ditches and levees so that the water table remains below a depth of 36 inches. Runoff is very slow, and erosion is a slight hazard. The available water capacity is 8 to 10 inches.

This soil is used mostly for irrigated tomatoes, sugar beets, and grain sorghum. It is also used for dryfarmed small grain and safflower, wildlife habitat, and recreation. Capability unit IIIw–5 (17); not placed in a range site.

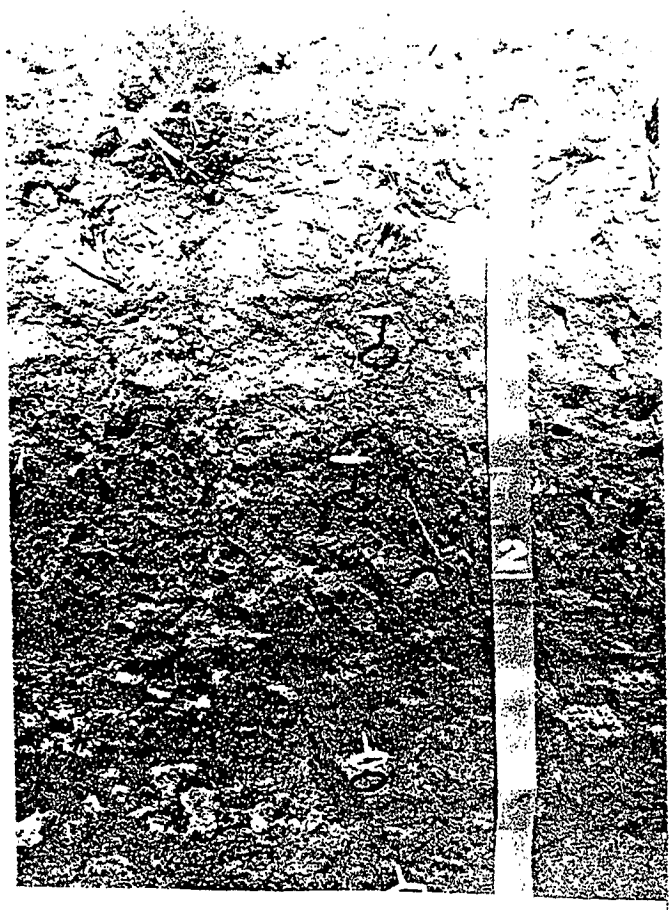
Ryde Series

The Ryde series consists of poorly drained, nearly level soils in delta areas. These soils are high in con- URVEY

tent of organic matter. They formed in mixed alluvial and organic materials. The average annual temperature is 58° to 60° F., the average annual rainfall is 16 to 18 inches, and the frost-free season is 250 to 270 days. Elevation ranges from 10 feet below sea level to sea level.

In a representative profile (fig. 9), the surface layer is gray and dark-gray, mottled clay loam about 15 inches thick. Below this is very dark gray, mottled mucky loam 16 inches thick. The substratum is stratified gray or black, gleyed, mucky loam to clay that extends to a depth of more than 60 inches.

Permeability is moderate. The available water capacity is 15 to 18 inches, and in places roots extend to a depth of 60 inches where these soils are drained. The water table, which has been lowered to a depth of 36 to 48 inches, limits root penetration for mos plants.



this soil in mapping are small areas of Egbert silty clay loam and Sacramento clay.

The water table in this poorly drained soil has been lowered to about 3 to 4 feet by using drainage ditches and by pumping. Runoff is very slow, and erosion is a slight hazard.

This soil is used mostly for irrigated corn, sugar beets, tomatoes, and grain sorghum. It is also used for barley, wheat, safflower, wildlife habitat, and recreation. Capability unit IIIw–2 (16); not placed in a range site.

Ryde soils are used for irrigated row crops, forag crops, dryfarmed small grain, wildlife, and recreatio

Following is a representative profile of Ryde cla loam:

Ap1—0 to 8 inches, gray (10YR 5/1) clay loam that ha few, fine, prominent, pink (7.5YR 7/4) mottle very dark gray (10YR 3/1) when moist; moderat fine and medium, granular structure; hard, fria ble, sticky, plastic; common very fine and fin roots; many very fine interstitial pores; strongl acid; 5 to 10 percent organic matter; clea smooth boundary.

Ap2—8 to 15 inches, dark-gray (10YR 4/1) clay loam tha has few, fine, prominent, reddish-yellow (7.5YI 7/6) mottles, very dark gray (10YR 3/1) and ha few, fine, prominent, reddish-yellow (7.5YR 6/6 mottles when moist; weak, coarse, prismatic struc ture; extremely hard, firm, sticky, plastic; com mon very fine roots; many very fine tubular an interstitial pores; strongly acid; 5 to 10 percer organic matter; abrupt, wavy boundary.

A1—15 to 31 inches, very dark gray (10YR 3/1) muck loam that has few, fine, prominent, red (2.5Y 5/6) mottles, black (10YR 2/1) and has commo fine, prominent, dark-red (2.5YR 3/6) mottle when moist; moderate, coarse, prismatic structur parting to moderate, fine and medium, granula structure; slightly hard, friable, slightly stick nonplastic; few very fine roots; common very fir tubular pores and many very fine vesicular pores slightly acid; 15 to 20 percent organic matter; al rupt, wavy boundary.

C1—31 to 38 inches, mottled dark-gray (10YR 4/1), yello (10YR 7/6), and grayish-brown (2.5Y 5/2) cla mottled very dark grayish brown (10YR 3/2 ar 2.5Y 3/2) and light olive brown (2.5Y 5/4) whe moist; moderate, coarse, prismatic structure (i reversible vertical cracking); extremely hard, fir sticky, plastic; very few very fine roots; commo very fine tubular pores; slightly acid; 5 percer organic matter; abrupt, wavy boundary.

C2—38 to 41 inches, mottled very dark gray (10 YR 3/1 and very dark brown (10YR 2/2) mucky loam tha has strong-brown (7.5YR 5/6) organic fibers, ver dark brown (10YR 2/2) and has brown (7.5Y 4/4) organic fibers when moist; moderate, coars prismatic structure (irreversible vertical crac ing); hard, firm, nonsticky, nonplastic; no roots common very fine tubular pores; slightly acid; 1 to 30 percent organic matter; abrupt, wavy boun ary.

C3—41 to 44 inches, gray (5Y 5/1) mucky loam, black (5 2/1) when moist; moderate, coarse, prismat structure (irreversible vertical cracking); har firm, nonsticky, nonplastic; no roots; common ver fine tubular pores; slightly acid; 10 to 15 percer (estimated) organic matter.

C4—44 to 72 inches, stratified gleyed material that less than 5 to 40 percent organic matter; irreve sible vertical cracking extends into this horizon.

The A horizon ranges from very dark gray or gray grayish brown in color, from clay loam or silty clay loa to mucky loam in texture, from strongly acid to neutral reaction, and from 15 to 31 inches in thickness. The C ho rizon ranges from black, very dark gray, dark gray, gray to very dark brown in color; from mucky loam mucky silty clay loam to clay in texture; and from slight acid to mildly alkaline in reaction. Organic-matter conte ranges from 10 to 30 percent by weight, and it can be much as 40 percent in the lower part of the C horizo This soil is slightly saline in places.

Ryde clay loam (Ry).—This soil has the profile d scribed as representative for the series. Included wit

They have an effective rooting depth of 30 to 40 inches and an available water capacity of 5 to 7 inches. Runoff is medium, and erosion is a moderate hazard.

These soils are used for dryfarmed pasture and range. They are also used for dryfarmed small grain, wildlife habitat, and recreation. Capability unit IVe–3 (15); Fine Loamy range site.

Dibble-Los Osos clay loams, 30 to 50 percent slopes, eroded (DlF2).—This complex is about 60 percent Dibble clay loam and about 30 percent Los Osos clay loam. The remaining 10 percent is included small areas of Millsholm loam and Los Gatos loam. The Dibble soil is on ridge crests and on south-facing slopes, and the Los Osos soil is on north-facing slopes.

Both soils have the profile that is described as representative for their respective series. They are 25 to 40 inches deep. Available water capacity is 4 to 7 inches. Runoff is rapid, and erosion is a high hazard.

These soils are used for range, wildlife habitat, recreation, and watershed. Capability unit VIe–1 (15); Fine Loamy range site.

Egbert Series

The Egbert series consists of level to nearly level, poorly drained soils in basins. These soils formed in alluvium derived from mixed sources. Where these soils are not cultivated, the vegetation is annual grasses and forbs. The average annual temperature is 60° to 62° F., the average annual rainfall is 16 to 18 inches, and the frost-free season is 260 to 280 days. Elevation ranges from 5 feet below sea level to 10 feet above sea level.

In a representative profile, the surface layer is gray silty clay loam 31 inches thick. The subsoil is mottled, gray silty clay loam 14 inches thick. The substratum is mottled, gray silty clay loam that extends to a depth of more than 60 inches.

Permeability is moderately slow in the subsoil. Effective rooting depth is more than 60 inches. Available water capacity is 10 to 12 inches where these soils are drained. The water table is maintained at a depth of 48 to 60 inches.

Egbert soils are used for irrigated row crops, field crops, dryfarmed grain, wildlife habitat, and recreation.

Following is a representative profile of Egbert silty clay loam:

Ap—0 to 6 inches, gray (10YR 5/1) silty clay loam; few, fine, distinct, yellowish-brown (10YR 5/4) mottles; very dark gray (10YR 3/1) when moist; moderate, medium and coarse, granular structure; very hard, firm, sticky, plastic; many very fine and fine roots; common very fine tubular pores and many very fine interstitial pores; slightly acid; clear, smooth boundary.

A1—6 to 31 inches, gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) when moist; strong, very coarse, prismatic structure; very hard, firm, sticky, plastic; many very fine roots; common very fine and fine tubular pores; medium acid; gradual, wavy boundary.

B2g—31 to 45 inches, gray (10YR 6/1) silty clay loam that has common, fine, prominent, brown (7.5YR 5/4) and grayish-brown (2.5Y 5/2) mottles; very dark gray (10YR 3/1) and has common, fine, prominent, dark-brown (7.5YR 4/4) and dark grayish-brown (2.5Y 4/2) mottles when moist; moderate, very coarse, prismatic structure; very hard, very firm, sticky, plastic; many very fine and fine pores and few medium pores; medium acid; diffuse, smooth boundary.

Cg—45 to 60 inches, gray (5Y 6/1) silty clay loam that has many, large, prominent, reddish-yellow (7.5YR 6/6) mottles; dark gray (5Y 4/1) and has many, large, prominent, dark-brown (7.5YR 4/4) mottles when moist; moderate, very coarse, prismatic structure; very hard, firm, sticky, plastic; many very fine roots; common very fine and fine tubular pores; medium acid.

The A horizon ranges from gray to dark gray in color and from silty clay loam to heavy clay loam in texture. The A horizon is 8 to 31 inches thick. The B2g horizon ranges from gray to light gray in color and from silty clay loam to heavy clay loam in texture. Reaction is slightly acid to medium acid. Thickness is 12 to 20 inches. The C horizon ranges from gray to light gray in color and from silty clay loam to heavy clay loam in texture. Reaction is slightly acid to medium acid.

Egbert silty clay loam (Eb).—This nearly level soil is in basins. It has the profile described as representative for the series. Included with this soil in mapping are small areas of Sacramento clay, Ryde clay loam, and Omni silty clay.

The naturally poor drainage of this soil has been improved by leveling, using open drains, and pumping so that the water table remains at a depth of 4 to 5 feet. Runoff is very slow, and erosion is not a hazard.

This soil is used mostly for irrigated sugar beets, tomatoes, corn, alfalfa, and grain sorghum. It is also used for dryfarmed barley, safflower, wildlife habitat, and recreation. Capability unit IIw–2 (17); not placed in a range site.

Egbert silty clay loam, occasionally flooded (Ec).—This soil has a profile similar to the one described as representative for the series, except that it is subject to flooding. Flooding occurs on the average at least 1 year in 3 and lasts more than 48 hours. Included with this soil in mapping are small areas of Sacramento silty clay loam, occasionally flooded, and of Sycamore complex, occasionally flooded.

Runoff is very slow, and erosion is a slight hazard.

This soil is used principally for irrigated grain sorghum, tomatoes, sugar beets, and corn. It is also used for dryfarmed safflower, wildlife habitat, and recreation. Capability unit IVw–2 (17); not placed in a range site.

Gaviota Series

The Gaviota series consists of well-drained soils that are underlain by sandstone at a depth of 8 to 15 inches. These soils are on mountainous uplands. Slopes are 30 to 75 percent. The vegetation is annual grasses and forbs. The average annual temperature is 58° to 60° F., the average annual rainfall is 20 to 30 inches, and the frost-free season is about 230 to 250 days. Elevation ranges from 300 to 600 feet.

In a representative profile, the surface layer is brown sandy loam 12 inches thick. The substratum is mottled pale-brown and yellow sandstone.

the available water capacity is 10 to 12 inches and the effective rooting depth is more than 60 inches. The water table is at a depth of 36 to 48 inches.

This soil is used for irrigated row crops and field crops and for dryfarmed grain. Corn, tomatoes, grain sorghum, small grain, safflower, and sugar beets are the main crops grown.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Proper tillage minimizes soil compaction. Returning all crop residue to the soil helps to maintain tilth and to improve water intake. Proper management of irrigation water requires careful planning to prevent the leaching of nutrients, waterlogging the soil, and raising the water table. Sprinkler irrigation is suitable for this soil. Open drains or tile drains are needed to keep the water table below the root zone for most crops (fig. 19).

Crops respond to lime and to nitrogen and phosphorus fertilizers.

CAPABILITY UNIT IIIw-3(17)

Sacramento silty clay loam is the only soil in this unit. This is a poorly drained soil that formed in alluvium from mixed sources and was deposited over buried clay in basins. Slopes are 0 to 1 percent. Average annual rainfall is 16 to 18 inches, and the frost-free season is 250 to 270 days. Permeability is slow, runoff is slow, and erosion is a slight hazard. Where this soil is drained, the available water capacity is 9 to 11 inches and the effective rooting depth is 60 inches. The water table is at a depth of 36 to 48 inches.

This soil is used for irrigated row crops and field crops and for dryfarmed grain. Tomatoes, sugar beets, corn, and barley are the main crops.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Proper tillage minimizes soil compaction. Returning crop residue to the soil helps to maintain tilth and improves water intake. Open drains and tile drains are needed to control the water table and

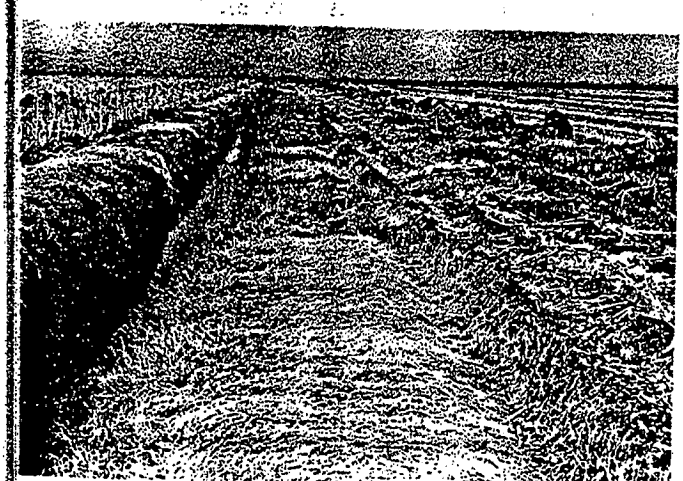


Figure 19.—Drainage ditch on Ryde clay loam.

thereby maintain a favorable condition in the rooting zone. Drainage is needed to remove excess surface water. Leveling is easily accomplished and aids in good management of irrigation water. Careful management of irrigation water is necessary to conserve water, to prevent waterlogging, and to keep the water table from rising.

Crops respond to nitrogen and phosphorus fertilizers.

CAPABILITY UNIT IIIw-5(17)

This unit consists of poorly drained clays and silty clays. These soils formed in basins in alluvium from mixed sources. Slopes are 0 to 1 percent. Average annual rainfall is 16 to 22 inches, and the frost-free season is 250 to 290 days. Permeability is slow, runoff is very slow, and erosion is a slight hazard. Where these soils are drained, the available water capacity is 7 to 10 inches and the effective rooting depth is more than 60 inches. The water table is at a depth of 20 to 60 inches.

These soils are used for irrigated row crops and field crops and for dryfarmed grain. The main crops are sugar beets, tomatoes, corn, grain sorghum, and barley.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Proper tillage minimizes soil compaction (fig. 20). Returning crop residue to the soil helps to maintain tilth and improves water intake. Drainage is needed to keep the water table at a suitable depth and to remove excess surface water. Leveling for irrigation and for surface drainage is not difficult, and it aids in good management of irrigation water. Management of irrigation water should be carefully planned to prevent waterlogging and to keep the water table from rising. These soils form large, hard clods if worked when too dry, and they seal over if worked when too wet.

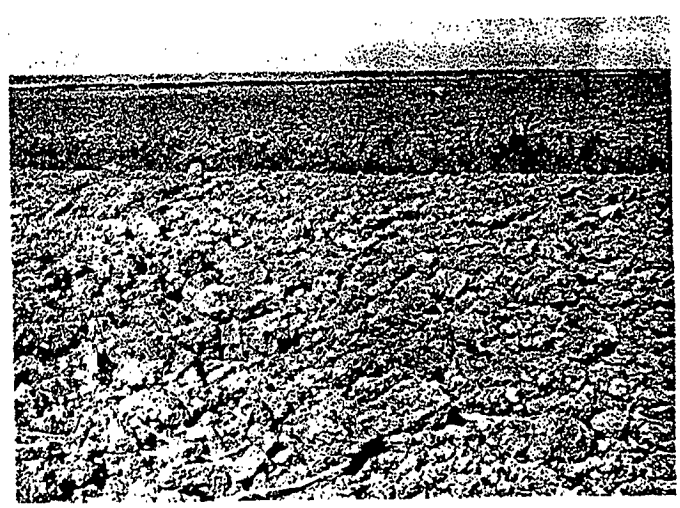


Figure 20.—Sacramento clay fall plowed and left rough during winter has a favorable water-intake rate.

CAPABILITY UNIT IIw-2(17)

This unit consists of somewhat poorly drained to poorly drained fine sandy loams to silty clay loams and of normally well-drained clay loams and loams that now have a fluctuating water table. All the soils formed in alluvium from mixed sources and are on alluvial fans. Slopes are 0 to 2 percent. Average annual rainfall is 16 to 25 inches, and the frost-free season is 250 to 290 days. Permeability is moderately rapid to moderately slow. Runoff is slow to very slow. Erosion is a slight hazard. Available water capacity is 7.5 to 12.0 inches. The water table is at a depth of 36 to 60 inches.

The soils in this unit are suited to irrigated row crops, hay crops, and orchards, and to dryfarmed small grain. Sugar beets, tomatoes, alfalfa, pears, prunes, and barley are the main crops grown. Long-lived, deep-rooted, deciduous fruit and nut trees are not well suited to the soils in this unit.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Returning crop residue to the soil helps to maintain tilth. Proper tillage minimizes soil compaction (fig. 18). In orchards, soil tilth and water intake can be improved by growing cover crops and green-manure crops, and mulching, or by using a program for controlling weeds that does not include tillage. Leveling is easily accomplished and is essential for good irrigation water management. Excess surface water must be removed. Good management of irrigation water prevents waterlogging of the soil and keeps the high water table from rising higher. Open drains and tile drains help to maintain the water table at a fairly uniform depth.

Crops respond to nitrogen and phosphorus fertilizers.

CAPABILITY UNIT IIIs-3(17)

This unit consists of moderately well drained loams and fine sandy loams that have a clay or heavy clay loam subsoil. These soils formed on low terraces in alluvium washed from soils derived from sedimentary rocks. Slopes are 0 to 2 percent. Average annual rainfall is 16 to 22 inches, and the frost-free season is 250 to 280 days. Permeability is very slow, runoff is very slow, and erosion is not a hazard. The available water capacity is 4 to 6 inches. The effective rooting depth is 20 to 30 inches.

These soils are used for shallow-rooted, irrigated row crops, irrigated pasture, and dryfarmed grain. The main crops are sugar beets, grain sorghum, and barley.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Proper tillage minimizes soil compaction. Returning crop residue to the soil helps to maintain tilth and improves water intake. Leveling should be done carefully to avoid exposure of the clayey subsoil. Good management of irrigation water is essential to prevent temporary waterlogging of the soil and to prevent the formation of a perched water table.

Crops respond to nitrogen and phosphorus fertilizers.

CAPABILITY UNIT IIIs-4(17)

Tujunga fine sand is the only soil in this unit. This is an excessively drained soil that formed from mixed deposits dredged from the Sacramento River. Slopes are 0 to 3 percent. Average annual rainfall is 16 to 18 inches, and the frost-free season is 250 to 270 days. Permeability is rapid, runoff is very slow, and erosion is a slight hazard. The available water capacity is 3.5 to 4.5 inches. The effective rooting depth is more than 60 inches.

This soil is used for limited dryland pasture and irrigated orchard.

A suitable conservation system includes legumes and crops that produce a large amount of residue. Returning crop residue to the surface layer helps to control soil blowing, improves tilth, and maintains fertility. In orchards, soil tilth and water intake can be improved by growing cover crops and green-manure crops, and mulching, or by using a program for controlling weeds that does not include tillage. Proper management of irrigation water requires careful planning to prevent the leaching of nutrients and the wasting of water. Sprinkler irrigation is suitable for this soil.

Crops respond to a complete fertilizer containing nitrogen, phosphorus, and potassium.

CAPABILITY UNIT IIIw-2(16)

Ryde clay loam is the only soil in this unit. This is a poorly drained soil that contains 10 to 30 percent organic matter. It formed from mixed alluvium and hydrophytic plant remains in delta areas. Slopes are 0 to 1 percent. The average annual rainfall is 16 to 18 inches, and the frost-free season is 250 to 270 days. Permeability is moderate, runoff is very slow, and erosion is a slight hazard. Where this soil is drained, the available water capacity is 10 to 12 inches and the effective rooting depth is more than 60 inches. The water table is at a depth of 36 to 48 inches.

This soil is used for irrigated row crops and field crops and for dryfarmed grain. Corn, tomatoes, grain sorghum, small grain, safflower, and sugar beets are the main crops grown.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Proper tillage minimizes soil compaction. Returning all crop residue to the soil helps to maintain tilth and to improve water intake. Proper management of irrigation water requires careful planning to prevent the leaching of nutrients, waterlogging the soil, and raising the water table. Sprinkler irrigation is suitable for this soil. Open drains or tile drains are needed to keep the water table below the root zone for most crops (fig. 19).

Crops respond to lime and to nitrogen and phosphorus fertilizers.

CAPABILITY UNIT IIIw-3(17)

Sacramento silty clay loam is the only soil in this unit. This is a poorly drained soil that formed in alluvium from mixed sources and was deposited over buried clay in basins. Slopes are 0 to 1 percent. Average annual rainfall is 16 to 18 inches, and the frost-free season is 250 to 270 days. Permeability is slow, runoff is slow, and erosion is a slight hazard. Where this soil is drained, the available water capacity is 9 to 11 inches and the effective rooting depth is 60 inches. The water table is at a depth of 36 to 48 inches.

This soil is used for irrigated row crops and field crops and for dryfarmed grain. Tomatoes, sugar beets, corn, and barley are the main crops.

A suitable conservation cropping system includes legumes and crops that produce a large amount of residue. Proper tillage minimizes soil compaction. Returning crop residue to the soil helps to maintain tilth and improves water intake. Open drains and tile drains are needed to control the water table and

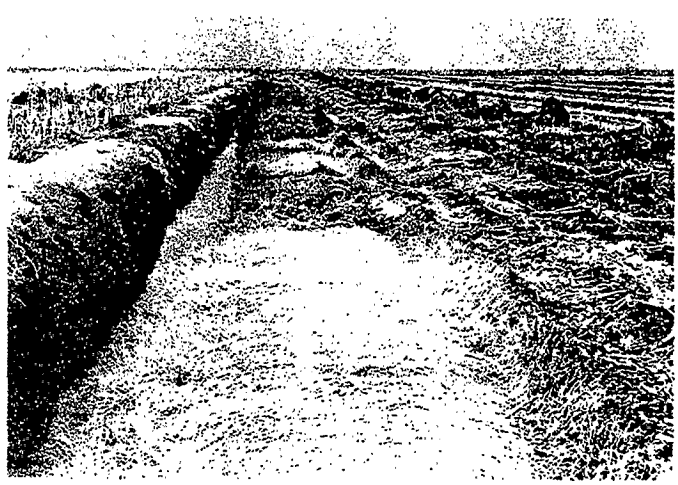


Figure 19.—**Drainage ditch on Ryde clay loam.**