

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 145 to 150 days

*Note:* This map unit is on gently sloping plains. The Kimst soil is on side slopes. The Canyon soil is on summits. The native vegetation is mainly grasses.

### **Component Description**

#### **Kimst and similar soils**

*Percent of the map unit:* 45 percent

*Landform:* Plains

*Slope range:* 2 to 5 percent

*Surface layer texture:* Loam

*Depth to restrictive feature:* More than 60 inches

*Drainage class:* Well drained

*Parent material:* Fine-loamy eolian deposits over fine-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 10.5 inches

*Typical profile:*

A—0 to 4 inches; loam

AC—4 to 7 inches; loam

C1—7 to 30 inches; loam

C2—30 to 60 inches; sandy clay loam

#### **Canyon and similar soils**

*Percent of the map unit:* 25 percent

*Landform:* Plains

*Landform element:* Summits

*Slope range:* 2 to 5 percent

*Surface layer texture:* Loam

*Depth to restrictive feature:* Paralithic bedrock at a depth of 10 to 20 inches

*Drainage class:* Well drained

*Parent material:* Loamy, calcareous sandstone derived from residuum

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 1.7 inches

*Typical profile:*

A—0 to 3 inches; loam

AC—3 to 7 inches; gravelly loam

C—7 to 13 inches; gravelly loam

Cr—13 to 17 inches; weathered bedrock

#### **Additional components**

Satanta and similar soils: 10 percent

Stoneham and similar soils: 5 percent

Wiley and similar soils: 5 percent

Rock outcrop: 10 percent

### **Management**

*Major uses:* Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are the depth to bedrock, the hazards of soil blowing and water erosion, low organic matter content, low fertility, and lime-induced chlorosis. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. If the Wiley soil is tilled deep, it is subject to lime-induced chlorosis. The Canyon soil is shallow to bedrock. Tillage may be restricted by the areas of rock outcrop.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the depth to bedrock, the hazard of soil blowing, lime-induced chlorosis, and low precipitation. Planting the trees on the contour helps to conserve moisture. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

## **39—Kimst-Richfield, eroded, complex, 1 to 5 percent slopes**

### **Setting**

*Location:* This map unit occurs south of Bethune, Stratton, and Vona.

*Elevation:* 4,301 to 5,200 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 145 to 152 days

*Note:* This map unit is on nearly level and gently sloping erosional remnants of plains. A thin loess cap is over the Ogallala Formation. The native vegetation is mainly grasses.

### **Component Description**

#### **Kimst and similar soils**

*Percent of the map unit:* 45 percent

*Landform:* Plains

*Slope range:* 1 to 5 percent

*Surface layer texture:* Clay loam

*Depth to restrictive feature:* More than 60 inches

*Drainage class:* Well drained

*Parent material:* Fine-loamy eolian deposits over fine-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 10.7 inches

*Typical profile:*

Ap—0 to 4 inches; clay loam

AC—4 to 12 inches; clay loam

C1—12 to 20 inches; clay loam

C2—20 to 41 inches; clay loam

C3—41 to 60 inches; clay loam

### **Richfield and similar soils**

*Percent of the map unit:* 30 percent

*Landform:* Plains

*Slope range:* 1 to 3 percent

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* More than 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey, calcareous loess

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 10.8 inches

*Typical profile:*

Ap—0 to 5 inches; silty clay loam

Bt—5 to 15 inches; silty clay

Bk—15 to 24 inches; silty clay loam

Ck1—24 to 27 inches; silty clay loam

Ck2—27 to 49 inches; silty clay loam

2C—49 to 60 inches; clay loam

### **Additional components**

Rago and similar soils: 10 percent

Bethune and similar soils: 5 percent

Stoneham and similar soils: 5 percent

Pleasant and similar soils: 2 percent

Rock outcrop: 2 percent

Lodgepole and similar soils: 1 percent

### **Management**

*Major uses:* Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, the hazards of water erosion and soil blowing, and tilling on the Kimst and Richfield soils. The Kimst soil is also limited by low organic matter content, low fertility, and lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage may be more difficult because of the hazard of soil blowing, which results in the loss of the surface layer.

Tillage should be minimized. Minimizing tillage is critical because areas of the Kimst soil are more susceptible to soil blowing than areas of the Richfield soil. A crust that reduces the rate of water infiltration

may form on the Kimst and Richfield soils. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Terraces and contour farming can be used in areas that have smooth slopes. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. Irrigation water should be applied at a rate that ensures optimum production without increasing deep percolation, runoff, and erosion. A tillage pan forms easily if these soils are tilled during wet periods.

The Kimst soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. In the Richfield and Bethune soils, deep tillage may bring the lime closer to the surface. Tillage may be restricted by the areas of rock outcrop.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, lime-induced chlorosis in the Kimst soil, and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

## **40—Kimst-Wages sandy clay loams, 1 to 6 percent slopes**

### **Setting**

*Location:* This map unit occurs throughout the survey area but is dominantly in the western part.

*Elevation:* 4,301 to 5,200 feet

*Mean annual precipitation:* 13 to 17 inches

*Frost-free period:* 145 to 152 days

*Note:* This map unit is on nearly level and gently sloping plains. The Kimst soil is on summits, and the Wages soil is on side slopes. The native vegetation is mainly grasses.

### **Component Description**

#### **Kimst and similar soils**

*Percent of the map unit:* 60 percent

*Landform:* Plains

*Landform element:* Summits

*Slope range:* 1 to 6 percent

*Surface layer texture:* Sandy clay loam

*Landform:* Plains  
*Slope range:* 0 to 2 percent  
*Surface layer texture:* Silt loam  
*Depth to restrictive feature:* More than 60 inches  
*Drainage class:* Well drained  
*Parent material:* Clayey, calcareous loess  
*Native plant cover type:* Rangeland  
*Flooding:* None  
*Available water capacity:* Mainly 10.9 inches  
*Typical profile:*  
 Ap—0 to 5 inches; silt loam  
 Bt—5 to 15 inches; silty clay loam  
 Bk1—15 to 23 inches; silty clay loam  
 Bk2—23 to 37 inches; silt loam  
 C—37 to 60 inches; silt loam  
*Additional components:*  
 Norka and similar soils: 10 percent  
 Pleasant and similar soils: 4 percent  
 Lodgepole and similar soils: 1 percent

### **Management**

*Major uses:* Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. This soil is very productive.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

## **73—Richfield silty clay loam, 0 to 2 percent slopes**

### **Setting**

*Location:* This map unit occurs in the northwestern part of the survey area.

*Elevation:* 4,501 to 5,000 feet

*Mean annual precipitation:* 15 to 17 inches

*Frost-free period:* 148 to 152 days

*Note:* This very deep, well drained soil is on nearly level plains. It formed in loess. The native vegetation is mainly grasses.

### **Component Description**

#### **Richfield and similar soils**

*Percent of the map unit:* 85 percent

*Landform:* Plains

*Slope range:* 0 to 2 percent

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* More than 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey, calcareous loess

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 10.8 inches

*Typical profile:*

Ap—0 to 7 inches; silty clay loam

Bt—7 to 15 inches; silty clay

Btk—15 to 21 inches; silty clay loam

Bk—21 to 27 inches; silty clay loam

C—27 to 60 inches; silt loam

*Additional components:*

Rago and similar soils: 10 percent

Pleasant and similar soils: 4 percent

Lodgepole and similar soils: 1 percent

### **Management**

*Major uses:* Irrigated cropland, nonirrigated cropland, and rangeland

The main limitation affecting irrigated and nonirrigated crops is a tillage pan that forms easily if this soil is tilled during wet periods. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Chiseling or subsoiling breaks up the tillage pan. A crust that reduces the rate of water infiltration can form on the Richfield soil. Returning crop residue to the soil minimizes crusting, reduces the hazard of water erosion, and increases the water intake rate. This soil is very productive.

Controlled livestock management is the major management practice needed on this map unit.

No limitations affect windbreaks and environmental plantings.

## **74—Richfield silty clay loam, dry, 0 to 2 percent slopes, eroded**

### **Setting**

*Location:* This map unit occurs dominantly in the central and western parts of the survey area.

*Elevation:* 4,301 to 5,200 feet

*Mean annual precipitation:* 13 to 15 inches

*Frost-free period:* 145 to 148 days

*Note:* This very deep, well drained soil is on nearly level plains. It formed in loess. The native vegetation is mainly grasses.

### **Component Description**

#### **Richfield and similar soils**

*Percent of the map unit:* 80 percent

*Landform:* Plains

*Slope range:* 0 to 2 percent

*Surface layer texture:* Silty clay loam

*Depth to restrictive feature:* More than 60 inches

*Drainage class:* Well drained

*Parent material:* Clayey, calcareous loess

*Native plant cover type:* Rangeland

*Flooding:* None

*Available water capacity:* Mainly 10.8 inches

*Typical profile:*

Ap—0 to 5 inches; silty clay loam

Bt—5 to 15 inches; silty clay

Bk—15 to 24 inches; silty clay loam

Ck1—24 to 27 inches; silty clay loam

Ck2—27 to 49 inches; silty clay loam

2C—49 to 60 inches; clay loam

*Additional components:*

Colby and similar soils: 5 percent

Norka and similar soils: 5 percent

Pleasant and similar soils: 4 percent

Wiley and similar soils: 3 percent

Weld and similar soils: 2 percent

Lodgepole and similar soils: 1 percent

### **Management**

*Major uses:* Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation and tillth. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. A crust that reduces the rate of water infiltration can form on the Richfield soil. A tillage pan forms easily if this soil is tilled during wet periods. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazard of water erosion, and increases the water intake rate.

In the Richfield and Wiley soils, deep tillage may bring the lime closer to the surface, resulting in lime-induced chlorosis. The Colby soil also is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Because of the restricted permeability, the application of water should be regulated so that water does not stand on the surface and damage the crops.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is low precipitation. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

## **75—Sampson loam, 0 to 2 percent slopes, rarely flooded**

### **Setting**

*Location:* This map unit is dominantly in the western part of the survey area.

*Elevation:* 4,301 to 5,200 feet

*Mean annual precipitation:* 13 to 15 inches

*Frost-free period:* 145 to 148 days

*Note:* This very deep, well drained soil is in narrow, intermittent drainageways. It formed in alluvium. The native vegetation is mainly grasses.

### **Component Description**

#### **Sampson and similar soils**

*Percent of the map unit:* 85 percent

*Landform:* Drainageways

*Slope range:* 0 to 2 percent

*Surface layer texture:* Loam

*Depth to restrictive feature:* More than 60 inches

*Drainage class:* Well drained

*Parent material:* Fine-loamy alluvium

*Native plant cover type:* Rangeland

*Flooding frequency:* Rare

*Available water capacity:* Mainly 9.9 inches

*Typical profile:*

A—0 to 6 inches; loam

BA—6 to 10 inches; clay loam

Bt1—10 to 20 inches; clay loam

Bt2—20 to 29 inches; clay loam

Bt3—29 to 38 inches; clay loam

BC—38 to 60 inches; sandy clay loam

*Additional components:*

Glenberg and similar soils: 5 percent

Satanta and similar soils: 5 percent

Pleasant and similar soils: 4 percent

Lodgepole and similar soils: 1 percent

### **Management**

*Major uses:* Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated crops