# HAZARD INDEX FOR SOILS

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# Nutrient TAC Report

- ***http://www.swrcb.ca.gov/nps/docs/tac_nutrient.doc***
- Recommended Hazard Index for:
  - Soils
  - Crops
  - Irrigation System

# Scale

- Nutrient TAC Report
  - Scale for Soil of 1, 2, and 3
- After Analysis and Discussion
  - Scale for Soil of 1 through 5

# Methodology

- USDA Soil Descriptions Accessed
  - Listed Irrigated Soils by State
  - Listed Non-Irrigated Soils

# Methodology Cont.

- Three Persons Independently
  - Reviewed Soil Descriptions
  - Selected Hazard Index Number
- Compiled HI Numbers
  - Approximately 80% agreement
  - Committee Reviewed soils with non-agreement and came to a consensus for HI

# Methodology Cont.

- Proposed HI lists Sent Out for Review
  - USDA Soil Scientists
  - State Cooperative Extension Advisors
- These Results Compiled
- Final HI Number Based upon the Greatest Agreement

# Methodology Cont.

- When there was a tie (say between 1 an 2)
- The final HI based upon consensus of the OUTSIDE EXPERTS

# USDA Soil Descriptions

- Website
  - http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi
- Main Portions Used
  - Typical Pedon
  - Range in Characteristics
  - Drainage and Permeability

# USDA Soil Descriptions

- Typical Pedon
  - Texture
  - Restrictive Layers
  - Evidence of Mottles

# Example

**HANFORD SERIES**

**TYPICAL PEDON:** Hanford fine sandy loam, pasture. (Colors are for dry soil unless otherwise noted.)

**A1--**0 to 12 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots in the upper few inches; many fine interstitial pores; slightly acid; gradual smooth boundary. (6 to 14 inches thick)

**C1--**12 to 36 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine interstitial pores; neutral; diffuse boundary. (10 to 24 inches thick)

**C2--**36 to 60 inches; light yellowish brown (10YR 6/4) fine sandy loam and sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; slightly alkaline.

# USDA Descriptions

- Range in Characteristics
  - Color Changes
  - Depth to Duripan or other restriction
  - Degree of Hardness or Cementation
  - Evidence of Chemical Reduction
  - Organic Matter Content

**RANGE IN CHARACTERISTICS:** Depth to duripan ranges from 14 to 36 model inches but is typically about 24 inches. The soils are dry for 60 consecutive days or more. Soil mantle alone is mixed.

Example

The A horizons range in color (10YR and 2.5Y hues) from grayish brown, light grayish brown, light gray to very pale brown; in texture from sandy loam to loam; in reaction from moderately to very strongly alkaline and usually calcareous; structure is massive but there may be a thin (inch) vesicular or platy crust on the surface. Dark brown irregular and spotty stains, indicative of an alkali condition, commonly occur at the surface and in the soil.

The B2t horizons range in color(10YR and 2.5Y hues) from light grayish brown to dark grayish brown with occasional light olive brown to olive brown, in texture from light clay loam, clay loam to sandy clay loam; in reaction from moderately to very strongly alkaline and in structure from moderate to strong angular blocky.

The hardpan is variable in degree of hardness but usually is strongly cemented.

# USDA Descriptions

- Drainage and Permeability

  Example Statement:

  Moderately well drained. Surface runoff and permeability are very slow; small pools of water commonly persist during wet winters.

# Soil HI Examples

- **HANFORD SERIES**
  - **Well drained**
  - **60 inches of sandy loam or fine sandy loam**
  - **OM less than 1%**
  - **Moderately rapid permeability**
  - **No mottles or restrictive layers**

**HI = 5**

# Soil HI Examples

- **CASTRO**
  - **Poorly Drained Soil**
  - **Strong Prominent Mottles**
  - **Clay**
  - **Slow to Very Slow Permeability**
  - **Lime Hardpan at 38 inches**

HI = 1

# Soil HI Examples

- **CROPLEY**
  - **Moderately Well Drained**
  - **Clay to Clay Loam**
  - **Light Mottles & Iron Deposits**
  - **Slow Permeability**

HI = 2

# Soil HI Examples

- **BOLFAR**
  - **Poorly Drained**
  - **Clay Loam to Loam**
  - **Grayish Green Color with Iron**
  - **Moderately Slow Permeability**
  - **Perched Water Table 3 to 5 feet**

HI = 2

# Soil HI Examples

- **HOLTVILLE**
  - **Well Drained**
  - **Silty Clay**
  - **No Evidence of Mottles**
  - **Cracks and Tubular Pores**
  - **Slow Permeability**

HI = 3

# Soil HI Examples

- YOLO
  - **Well Drained**
  - **Silt Loam**
  - **No Evidence of Mottles**
  - **Moderate Permeability**

HI = 3

# Soil HI Examples

- **BRYMAN**
  - **Well Drained Soil**
  - **(A) Loamy Sand, (B) Sandy Clay Loam**
  - **(C) Sand**
  - **Moderate Permeability**

HI = 4

# Soil HI Examples

- GUEST
  - Well Drained
  - 60 Inches of Clay, Cracks 1 cm wide
  - No Mottles
  - Very Slow Permeability
  - OM 1 to 3 %

HI = 1

# Soil HI Examples

- **GEPFORD**
  - **There is a subsoil variant that has rapidly permeable sand below the clay.**

HI = 4

# Deep Ripping

We must mention that when a soil has been deep ripped the grower or consultant should do a reevaluation of the HI.

Compact or Cemented Layers Destroyed