The Survey of Sugarcane Soil and Fertilizer Management (1992)

Preecha Prammanee et al.

By interview 500 cane growers in every cane growing area

- Chemical fertilizer is a major sugarcane production cost (8-12%)
- Thailand currently imports more than 30,000 million baths worth of chemical fertilizer
- Most of farmer (94%) lack of the basic knowledge of fertilizer use
- Low efficiency of fertilizer use

More than 50% apply fertilizer on top of the soil without cover

Only few growers cover the fertilizer

Use walking tractor

small tractor

Burning the cane also causes low efficiency use of fertilizer

Hard plowing

Soil surface compaction

The common questions from the farmers and sugar mills

1. What kind of fertilizer for this soil ?, How much ?

2. My farm soil is sandy (What? How much?)

3. I am using this kind of fertilizer. Is it suitable?

4. Do I use more or less fertilizer? Is it a good economic consideration?

5. My sugar mill is preparing the budget for fertilizer for the next growing season. How can I estimate?

Dicision Support System for fertilizer management (CaneFert 1.0)

How CaneFert 1.0 was developted

The development of CaneFert1.0 comprises of 11 experimental procedures

What type of soil and its property?

1. Cane soil identification (Canesoil 1.0)

2. Field survey to confirm the identification

3. Survey of sugarcane yield , soil identification and its location using global positioning system (GPS)

⊞ **Correlation between soil properties**

 and sugarcane yield

   4. Correlation between soil chemical

      properties and sugarcane yield

   5. Comparison between laboratory analysis

      and field analysis by test kit

What kind of fertilizer is required in each soil series

6. Nutrient requirement for sugarcane in each soil series.

7. Comparison of actual sugarcane yield and simulated yield by(CANEGRO 3.5) with water and nitrogen responses.

Economic consideration

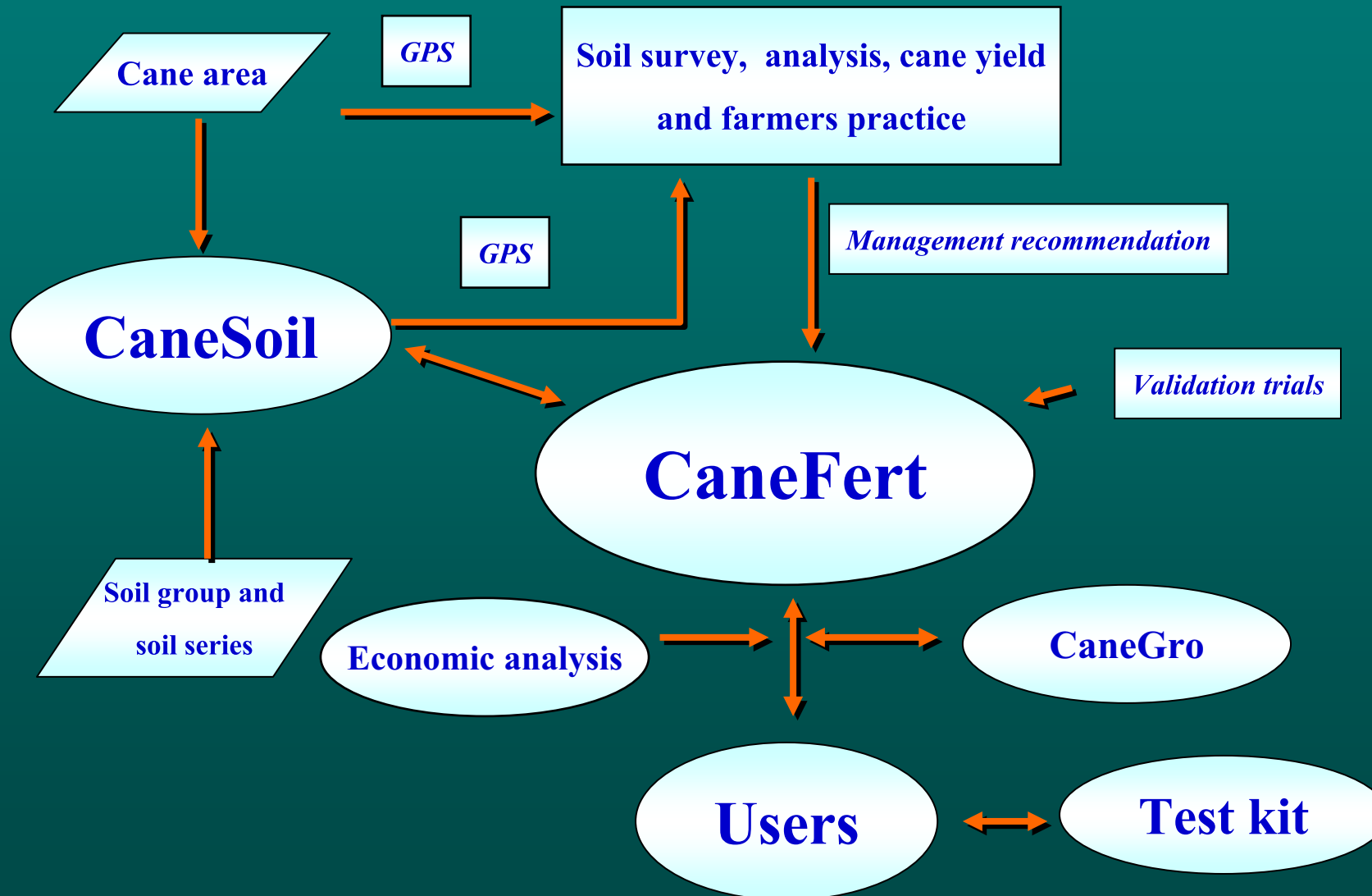8. Economic analysis for chemical

   fertilizer recommendation.

9. Soil data base for sugarcane simulation

Evaluation and technology transfer

10. The fertilizer trial to confirm the recommendation by CaneFert 1.0 and validation

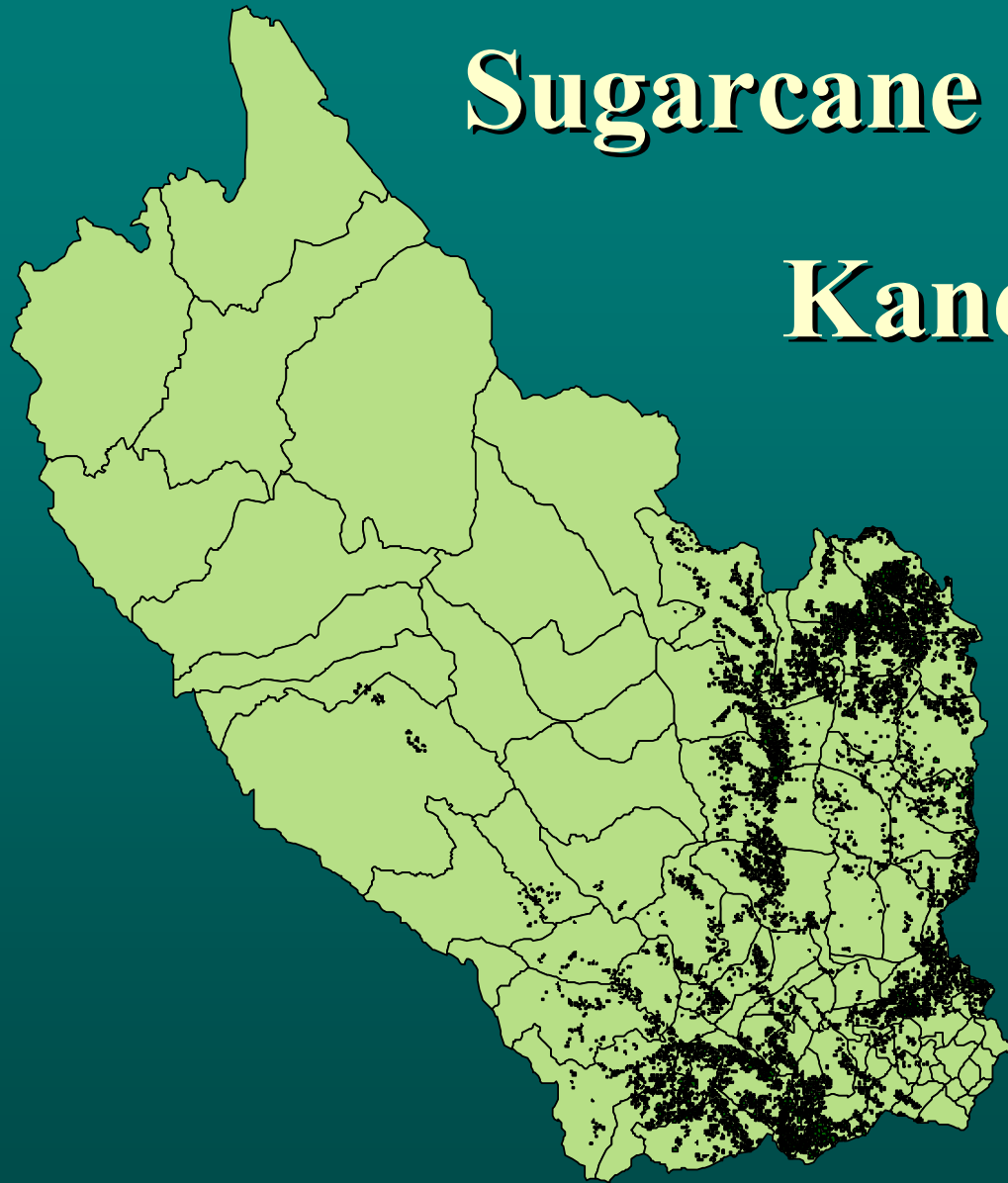11. Training course for growers and sugar mills extension officers

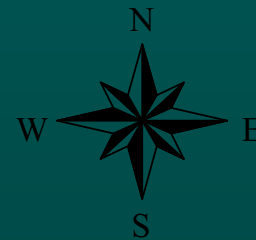# File structure for the CaneFert1.0 Software

Cane soil identification (CaneSoil 1.0)

Digital satellite images (LANDSAT 5^{tm}) of sugarcane planting areas were overplayed with a soil group map
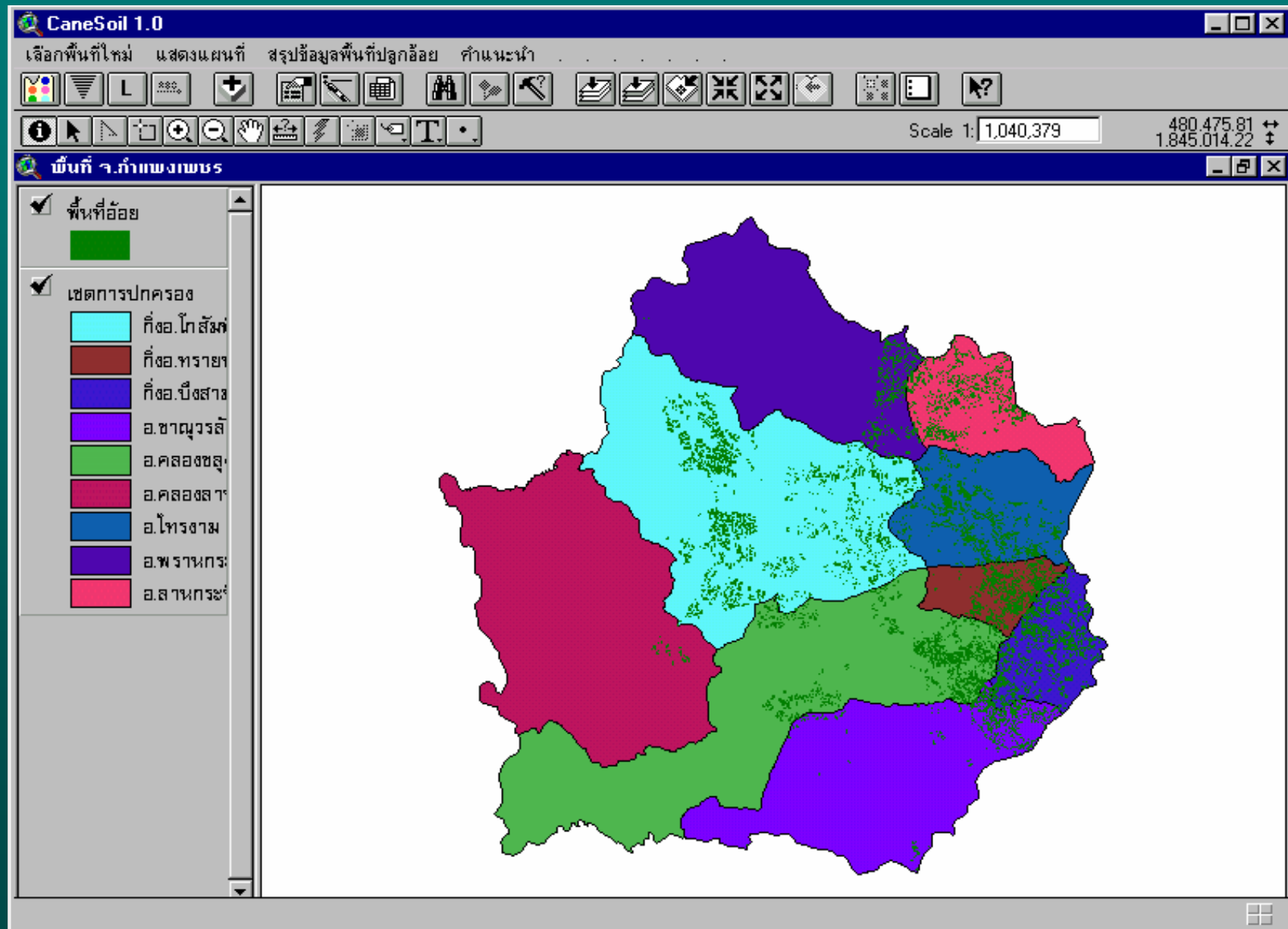
Sugarcane planting area in Kanchanaburi

Sugarcane planting area in Kampangpet

Soil group map in Kampangpet

สรุปพื้นที่ปลูกอ้อยตามกลุ่มชุดดินใน จ.กำแพงเพชร

พื้นที่(ไร่)	กลุ่มชุดดิน
35.6600	
52117.6800	กลุ่มชุดดินที่_15
1419.6400	กลุ่มชุดดินที่_15/16
4570.2700	กลุ่มชุดดินที่_15/21
1360.5000	กลุ่มชุดดินที่_15/33
1554.0700	กลุ่มชุดดินที่_16
391.7000	กลุ่มชุดดินที่_16/17
518.0900	กลุ่มชุดดินที่_16/18
1169.9000	กลุ่มชุดดินที่_17
432.3500	กลุ่มชุดดินที่_17/18
243.0800	กลุ่มชุดดินที่_17/21
1116.0900	กลุ่มชุดดินที่_18
831.8900	กลุ่มชุดดินที่_18/18d3
354.2300	กลุ่มชุดดินที่_18/21
1406.9500	กลุ่มชุดดินที่_21
120.6900	กลุ่มชุดดินที่_21/22
498.3100	กลุ่มชุดดินที่_22
342.5300	กลุ่มชุดดินที่_24
344.4700	กลุ่มชุดดินที่_25
3753.1100	กลุ่มชุดดินที่_3
717.3300	กลุ่มชุดดินที่_3/5
339.9800	กลุ่มชุดดินที่_3/59
296.4700	กลุ่มชุดดินที่_31B
1304.5400	กลุ่มชุดดินที่_31B/26B
138.1200	กลุ่มชุดดินที่_31B/46B
35873.7500	กลุ่มชุดดินที่_33
43.1000	กลุ่มชุดดินที่_33/33B

major soil series in central sugarcane production area classified by CaneSoil 1.0

Central					
Kanchanaburi		Suphanburi		Nakonpatom	
series	area (ha)	series	area (ha)	series	area (ha)
Kampangsean (Ks)	14,184	Kampangsean (Ks)	14,411	Kampangsean(Ks)	6,860
Yasothon (Yt)	11,523	Nakornpatom (Np)	12,155	Saraburi (Sb)	1,128
Sanpatong (Sp)	11,050	Donchedi (Dc)	5,909	Nakornpatom (Np)	236
Sikhiu (Si)	9,890	Saraburi (Sb)	3,800	Tamaung (Tm)	173

major soil series in northeastern sugarcane production area classified by CaneSoil 1.0

Northeast					
Udonthani		Nakonrachasima		Kalasin	
series	area (ha)	series	area (ha)	series	area (ha)
Yangtalat (Yl)	31,647	Yangtalat (Yl)	3,096	Yangtalat (Yl)	19,478
Korat (Kt)	15,254	Banphi (Bp)	16,935	Khambong (Kg)	8,569
Roiet (Re)	8,176	Korat (Kt)	3,284	Korat (Kt)	2,275
Phonpisai (Pp)	6,843	Sikhiu (Si)	1,953	Sithon (St)	2,098

Field survey to confirm the identification

Simple soil survey and classification methods were used

Soil harizon arrangement, colour texture, harizon depth and topography were used to identify

Area of soil survey and identification

- **Northeast**

Udonthani Kalasin Khon Kean

Nakonrachasima

52 samples

- **Central and West**

Rachaburi Saraburi Lobburi

Nakonsawan Uthaitani

Pracheub Kiri Khan

and Kanchanaburi

24 samples

Undisturbed cores

soil profile description

GPS: B: 48P 0209682
1740200

Date: 9/03/2544

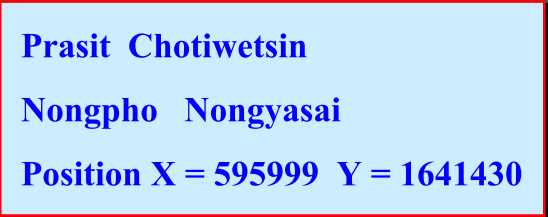| Site#	Location	ต.แก้ง สนามนาง	อ.แก้ง สนาม นาง	จ.นคร ราชสีมา	Land use	
# 30	Landform	Undulate	Slope	2-3% W to E; N to S		
Horizon	Depth (cm)	Texture (USDA)	Soil color	Mottles	Hardness (mm)	
Ap	0-20	S	5YR 5/4	-	12.5	
AE	20-32	LS	5YR 6/6	5YR 5/4 pachy	15.8	
E1	32-80	SL	5YR 7/8	5YR 5/8 few fine	18.0	
Bt1	80-90	SL-SCL	7.5YR 6/4	7.5YR 6/4	24.3	
Bt2	90-110+	Clay	5YR 6/8	7.5 YR 5/8	23.5	

Survey of sugarcane yield, soil identification and its location using global positioning system (GPS)

Sugarcane yield was sampled from the 45 cane farms. The harvested plots at each site were replicated four times the sampling plot comprised of four rows ten meters long.

Soil map and position of survey spot in Suphanburi

Prasit Chotiwetsin

Nongpho   Nongyasai

Position X = 595999 Y = 1641430

Mongkolchai   Mratsri

196 Plubplachai   Uthong

Position   X = 592834

Y = 1606702

Pranee   Jaitrong

75 Tongkok Songpinong

Position   X = 596706

Y = 1565881

Trimble Geoeplorer 3C

UP		PAGE
DOWN		POWER
ENTER		LCD DISPLAY