

## **Manejo e conservação do solo, 2009 (2º semestre)**

### **Impactos da erosão do solo**

**Imediatos: concentração da enxurrada**

**Degradação do solo: sulcos e laminar**

**Ambientais: deposição de sedimentos**

## A erosão do solo: **Formas**

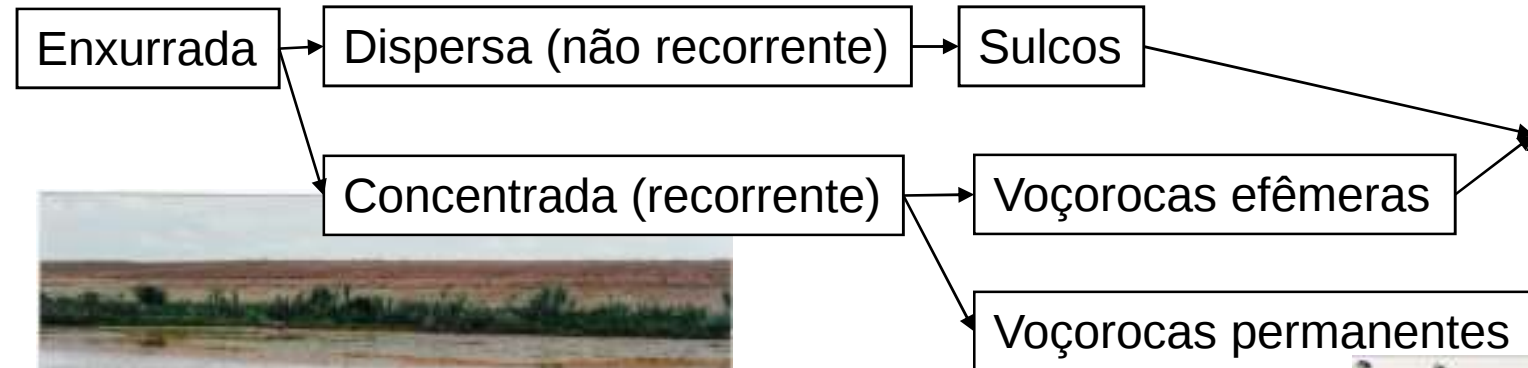
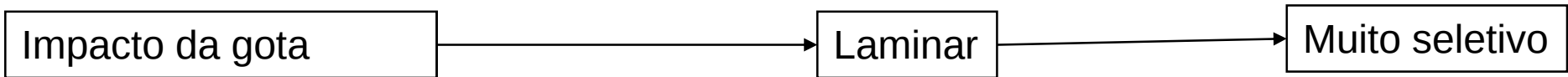
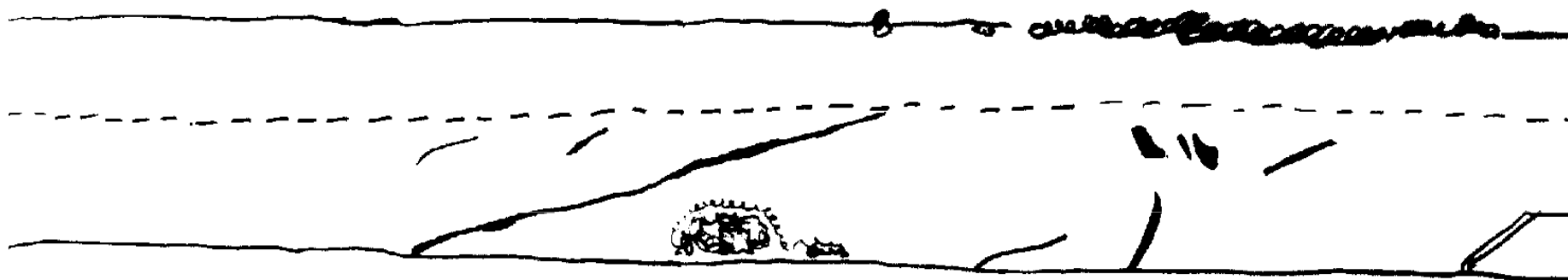








Foto: Sparovek (1996)



**Área afetada pelas voçorocas = 2,8%**





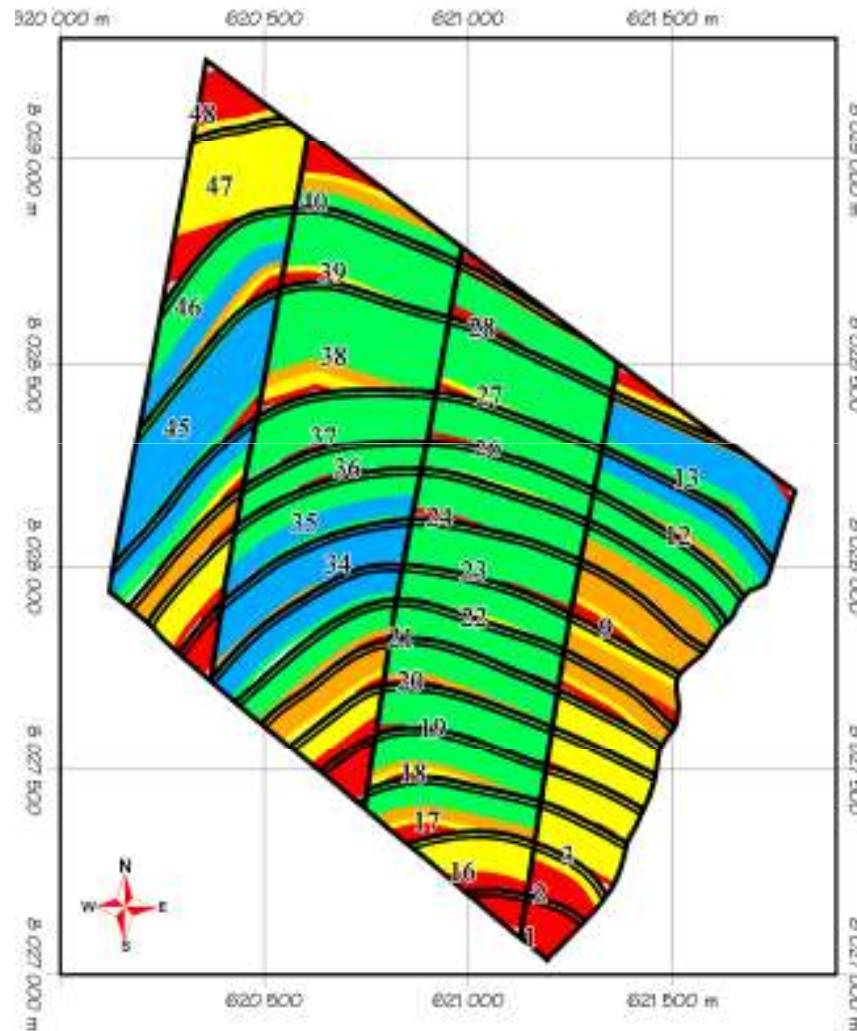
# QUADRO COMPARATIVO

FAZENDA: SANTA LAURA  
PRODUTOR: ANTONIO CARLOS DA CRUZ  
SAFRA 2006/2007

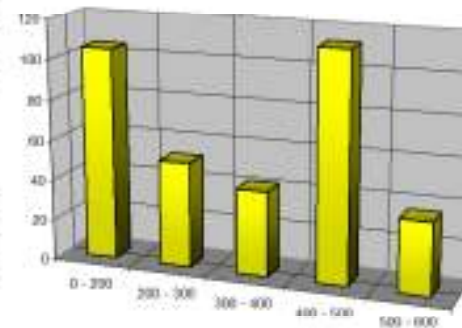
ACCSL

PROJETO DE ADEQUAÇÃO - SULCAÇÃO

CANA DE AÇÚCAR



Número de Sulcos / Classe de Tamanho



Comprimento de Sulco (m)

- 0 a 200
- 200 a 300
- 300 a 400
- 400 a 500
- 500 a 600

| Tabela | Número de Sulcos | Área (ha) | Comprimento (m) |
|--------|------------------|-----------|-----------------|
| 1      | 82               | 1,33      | 0,10            |
| 2      | 85               | 1,83      | 0,98            |
| 3      | 86               | 2,05      | 1,13            |
| 4      | 62               | 2,08      | 1,01            |
| 5      | 63               | 2,22      | 1,11            |
| 6      | 91               | 2,15      | 1,07            |
| 7      | 62               | 2,32      | 1,07            |
| 8      | 71               | 2,65      | 1,38            |
| 9      | 81               | 3,17      | 1,90            |
| 10     | 62               | 3,62      | 1,92            |
| 11     | 41               | 3,88      | 1,28            |
| 12     | 71               | 4,25      | 2,19            |
| 13     | 122              | 6,96      | 4,19            |
| 14     | 81               | 5,89      | 0,48            |
| 15     | 63               | 5,78      | 0,33            |
| 16     | 50               | 3,14      | 1,70            |
| 17     | 122              | 4,68      | 2,16            |
| 18     | 81               | 6,18      | 2,43            |
| 19     | 71               | 4,14      | 2,18            |
| 20     | 71               | 4,15      | 2,25            |
| 21     | 71               | 3,51      | 1,61            |
| 22     | 62               | 3,70      | 1,91            |
| 23     | 81               | 4,98      | 2,71            |
| 24     | 81               | 4,30      | 2,28            |
| 25     | 51               | 3,11      | 1,55            |
| 26     | 71               | 3,81      | 2,81            |
| 27     | 112              | 6,48      | 3,16            |
| 28     | 81               | 4,19      | 2,45            |
| 29     | 81               | 1,37      | 0,80            |
| 30     | 61               | 2,05      | 1,05            |
| 31     | 63               | 2,62      | 1,35            |
| 32     | 62               | 3,58      | 1,75            |
| 33     | 51               | 4,40      | 2,04            |
| 34     | 71               | 5,38      | 2,97            |
| 35     | 81               | 4,02      | 2,40            |
| 36     | 51               | 3,32      | 1,59            |
| 37     | 92               | 5,81      | 3,38            |
| 38     | 112              | 8,91      | 5,98            |
| 39     | 122              | 6,61      | 3,66            |
| 40     | 112              | 3,71      | 2,31            |
| 41     | 61               | 0,79      | 0,33            |
| 42     | 71               | 2,46      | 1,23            |
| 43     | 41               | 2,00      | 0,79            |
| 44     | 71               | 4,32      | 2,22            |
| 45     | 182              | 8,33      | 5,88            |
| 46     | 122              | 3,17      | 1,20            |
| 47     | 221              | 7,29      | 4,45            |
| 48     | 182              | 1,81      | 1,10            |
|        | 3844             | 186,38    | 130,94          |

| USO DO SOLO            | Área (ha) | Porcentagem (%) |
|------------------------|-----------|-----------------|
| ESTRADAS E CARREADORES | 12,61     | 6,71            |
| ÁREA COM TERRAÇOS      | 0,83      | 0,42            |
| ÁREA ÚTIL PLANTIO      | 186,51    | 93,28           |
|                        | 199,95    | 100,00          |

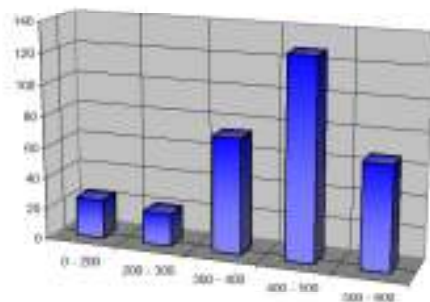
# QUADRO COMPARATIVO

FAZENDA: SANTA LAURA  
PRODUTOR: ANTONIO CARLOS DA CRUZ  
SAFRA 2006/2007

ACCSL

PROJETO DE ADEQUAÇÃO - SULCAÇÃO  
CANA DE AÇÚCAR

Número de Sulcos / Classe de Tamanho

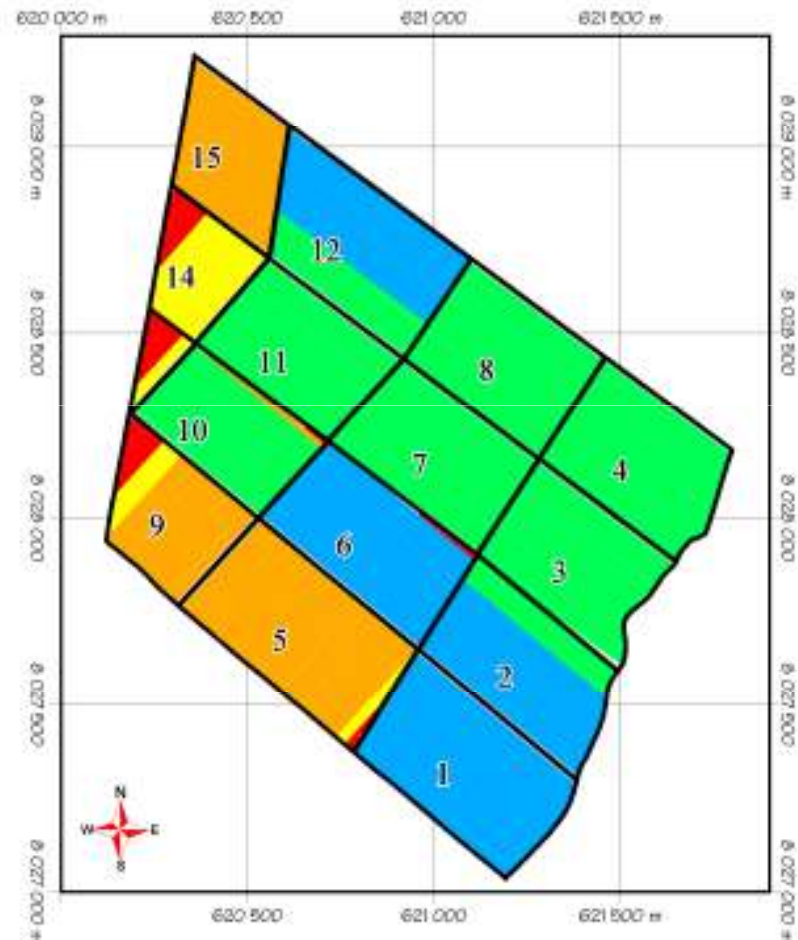


Comprimento de Sulcos (m)

- 0 a 200
- 200 a 300
- 300 a 400
- 400 a 500
- 500 a 600

| Tamanho | Número de Sulcos | Comprimento (m) | Área (ha) |
|---------|------------------|-----------------|-----------|
| 1       | 211              | 11,56           | 21,62     |
| 2       | 191              | 9,79            | 18,63     |
| 3       | 201              | 9,40            | 18,98     |
| 4       | 211              | 9,49            | 19,64     |
| 5       | 401              | 12,09           | 16,37     |
| 6       | 191              | 9,90            | 14,78     |
| 7       | 191              | 9,98            | 14,07     |
| 8       | 211              | 9,21            | 14,23     |
| 9       | 201              | 8,94            | 18,48     |
| 10      | 181              | 7,44            | 11,48     |
| 11      | 181              | 8,32            | 13,84     |
| 12      | 211              | 10,96           | 18,58     |
| 13      | 91               | 1,13            | 1,88      |
| 14      | 201              | 4,53            | 7,68      |
| 15      | 201              | 6,29            | 9,87      |
| TOTAL   | 3143             | 129,44          | 199,29    |

| USO DO SOLO            | Área (ha) | Porcentagem (%) |
|------------------------|-----------|-----------------|
| ESTRADAS E CARREADORES | 6,76      | 3,38            |
| ÁREA ÚTIL PLANTIO      | 193,20    | 96,62           |
|                        | 199,96    | 100,00          |



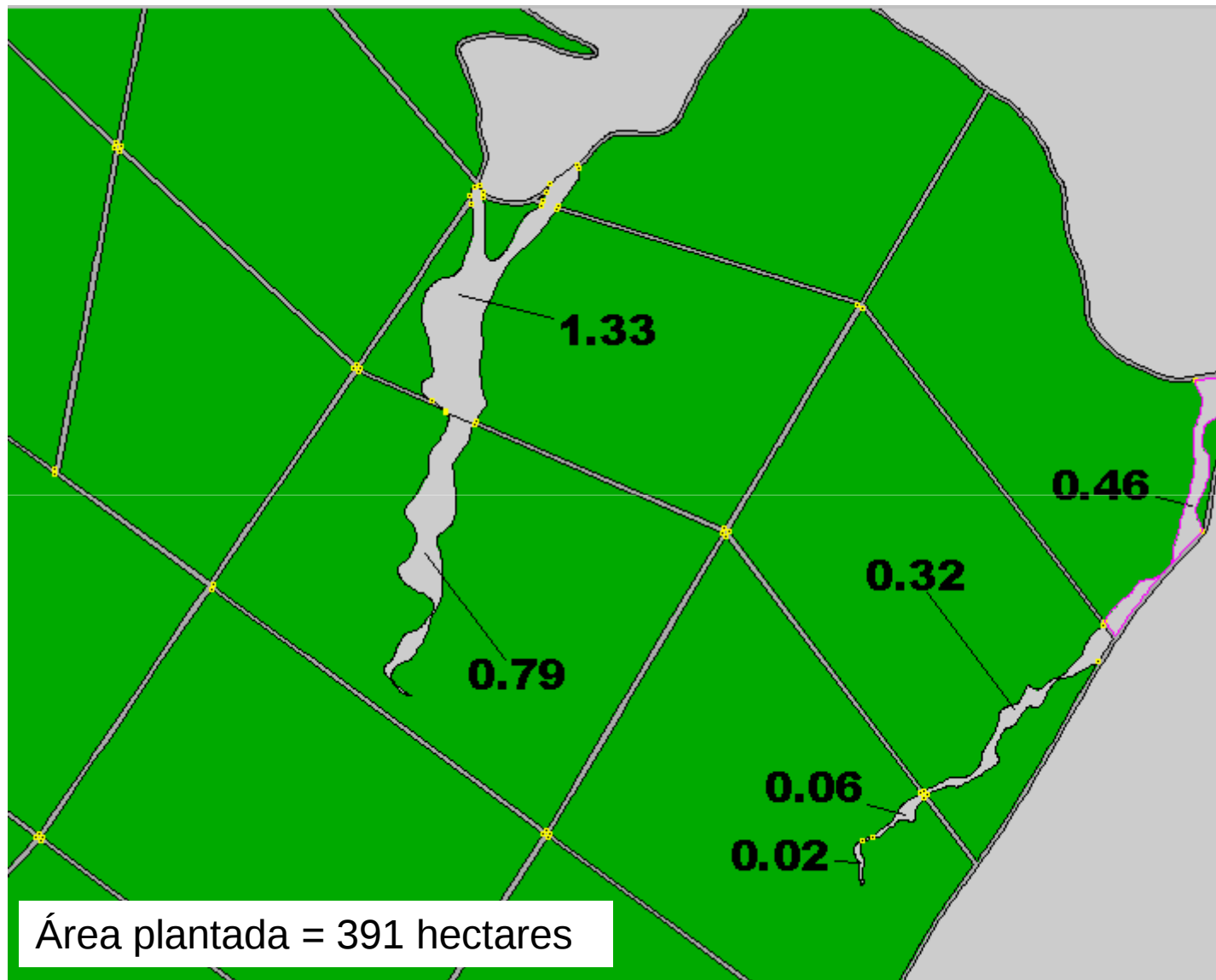
03/02/2007



03/02/2007



Área com erosão = 2,98 ha (0,76% da área plantada)



## **Manejo e conservação do solo, 2008 (2º semestre)**

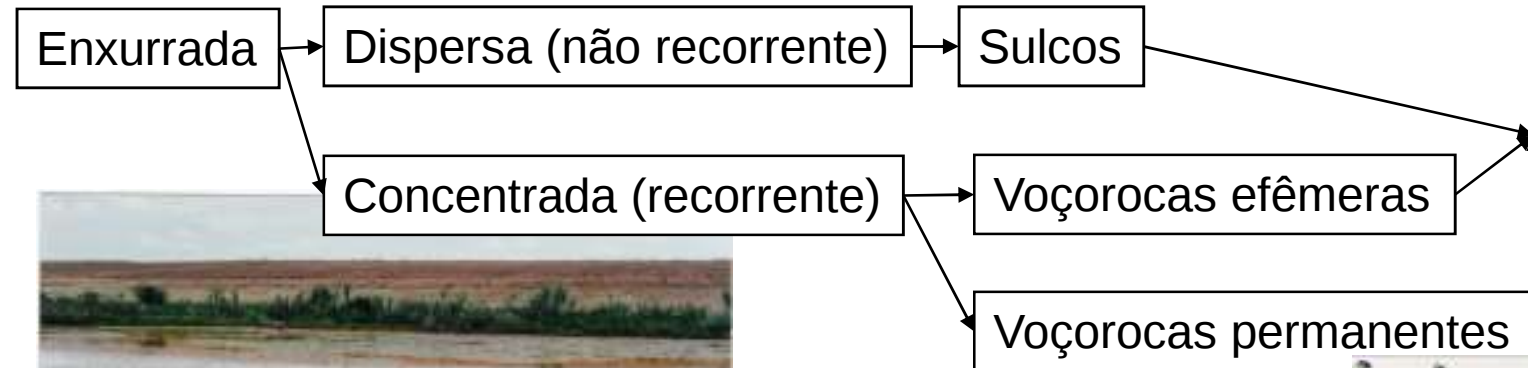
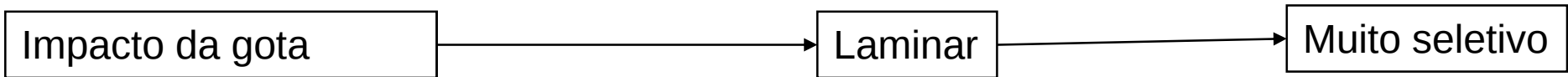
### **Impactos da erosão do solo**

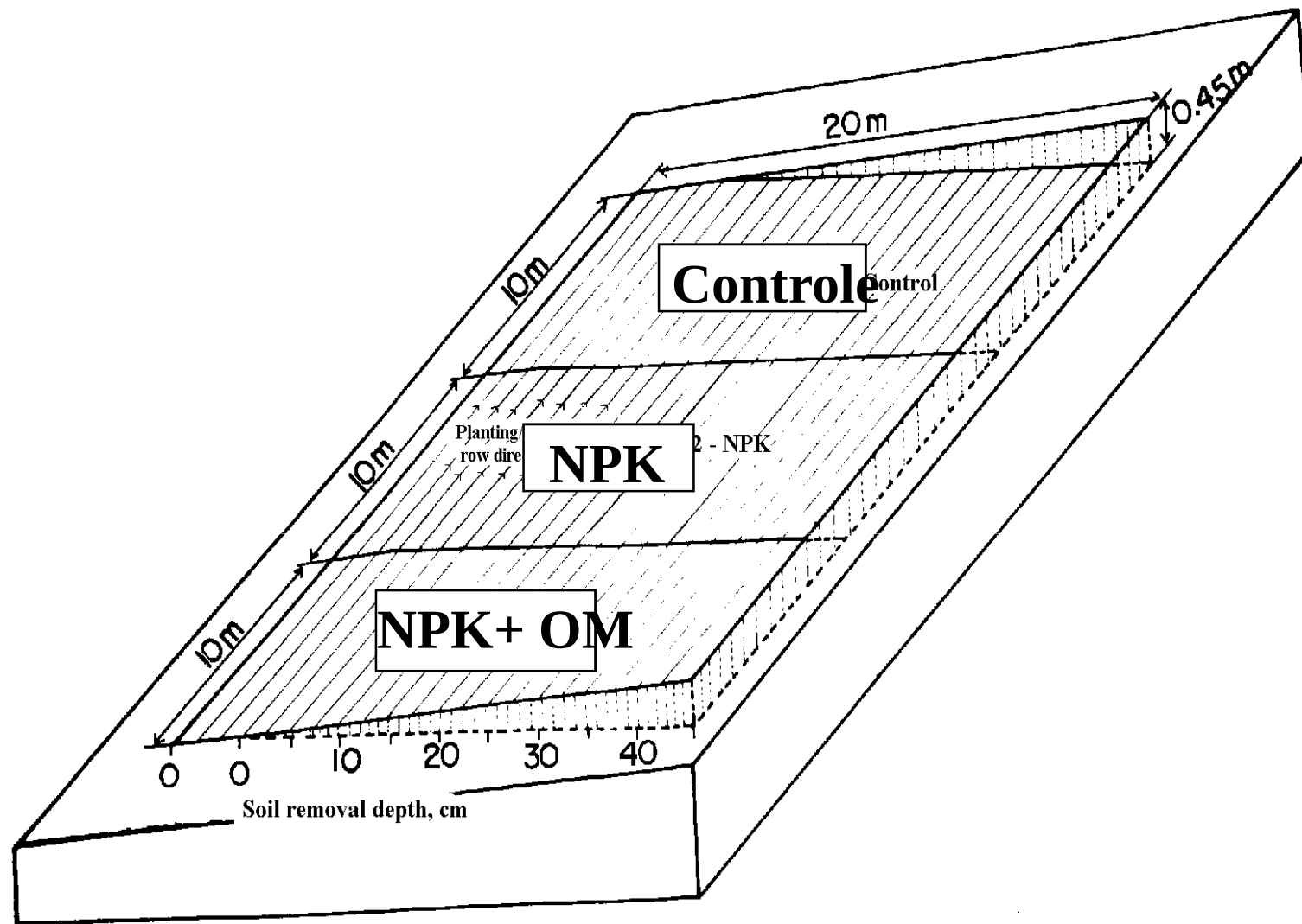
**Imediatos: concentração da enxurrada**

**Degradação do solo: sulcos e laminar**

**Ambientais: deposição de sedimentos**

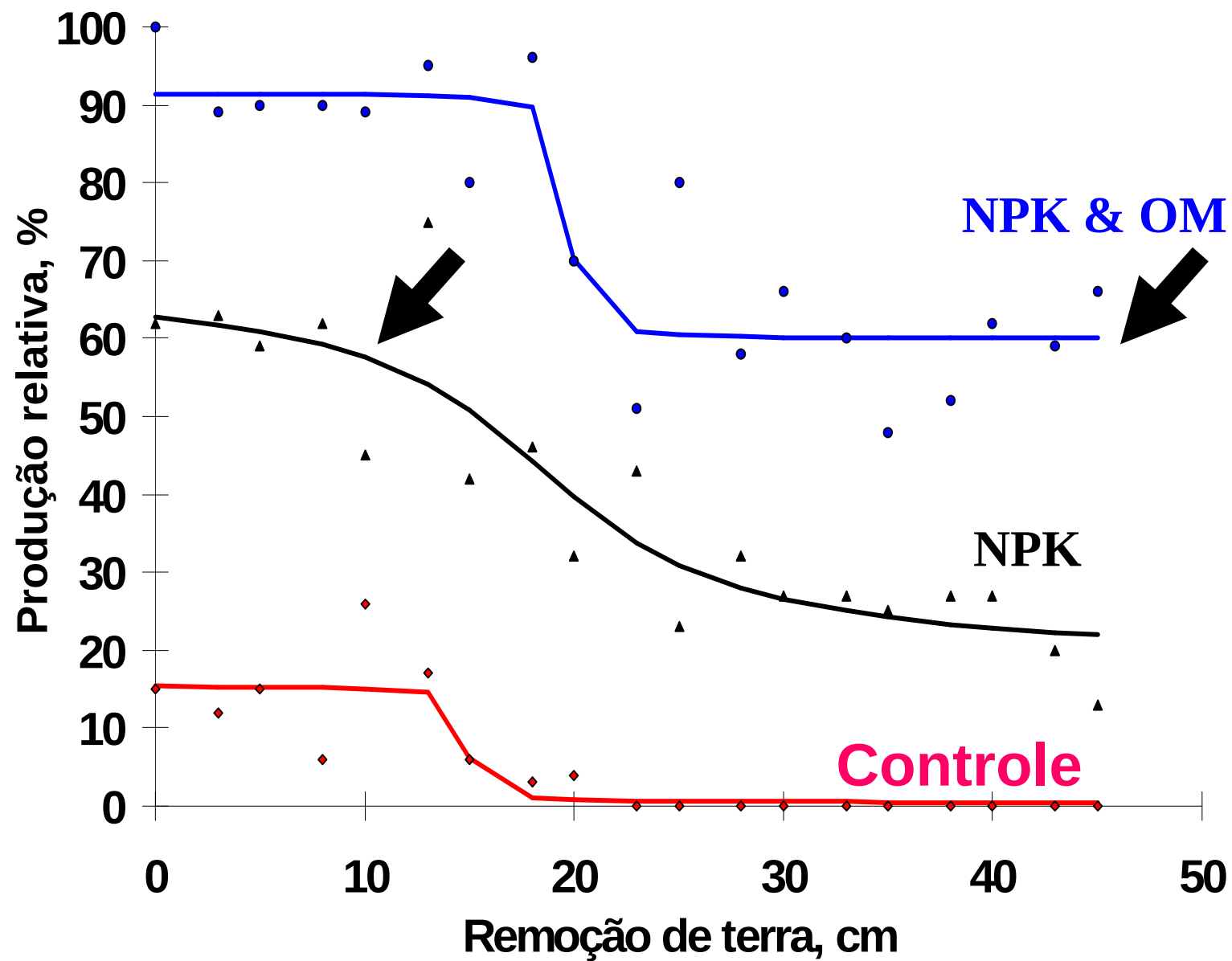
## A erosão do solo: **Formas**



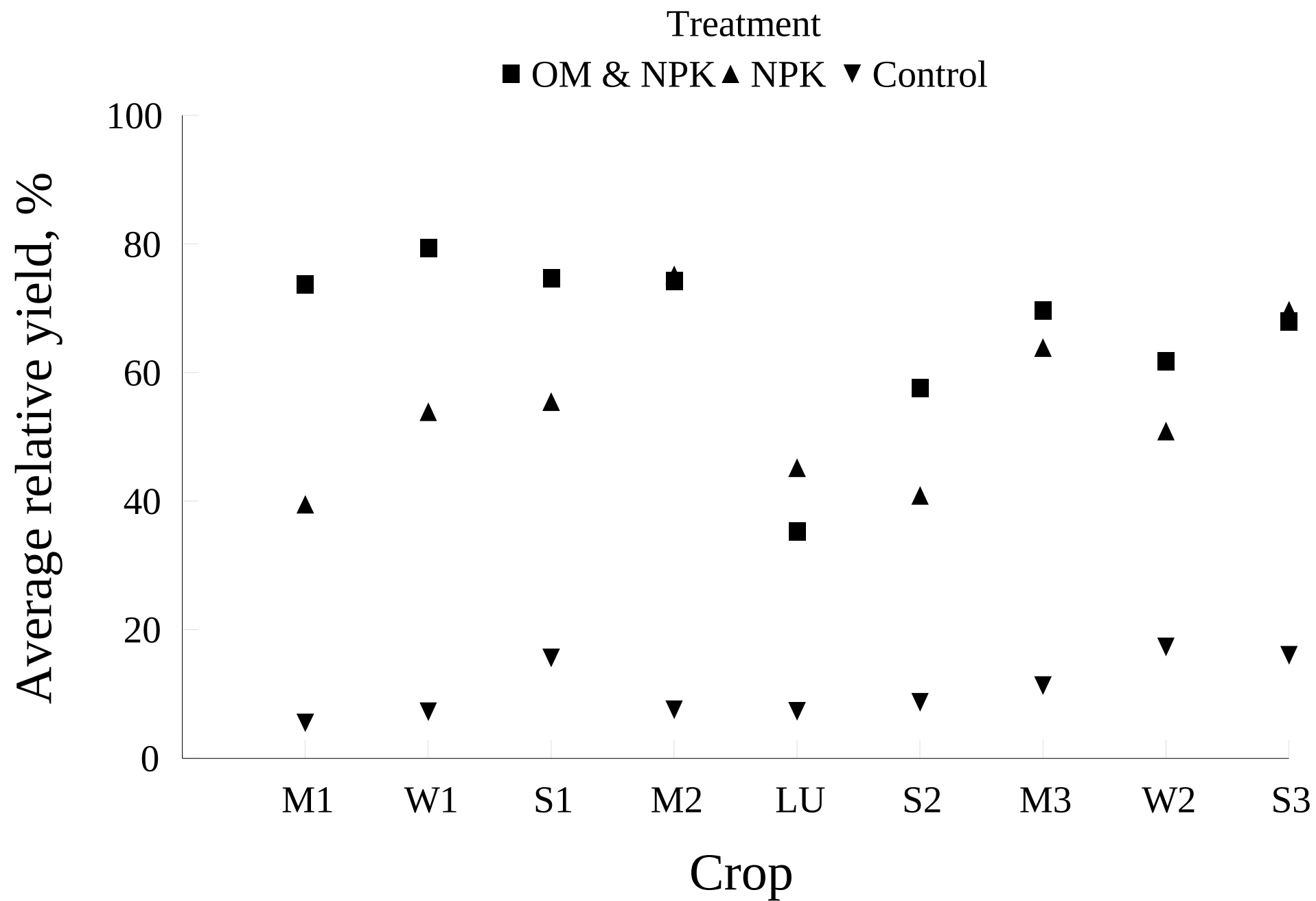




## Erosão simulada vs. produtividade do milho (89/90)









Sulcos de erosão



## Produtividade de *Crotalaria juncea* vs espessura solo

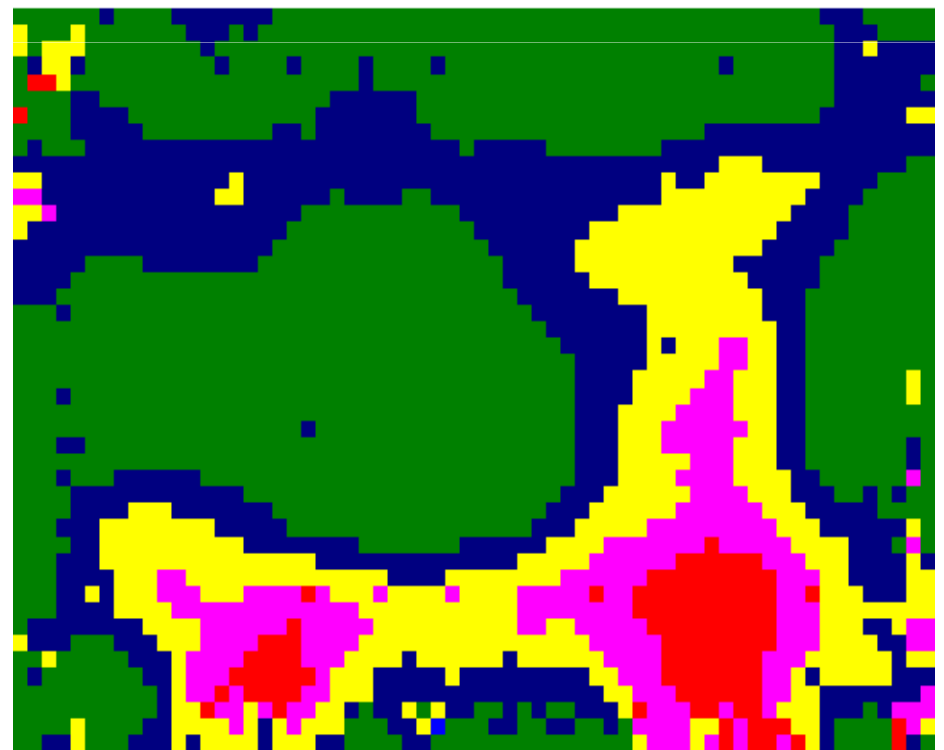
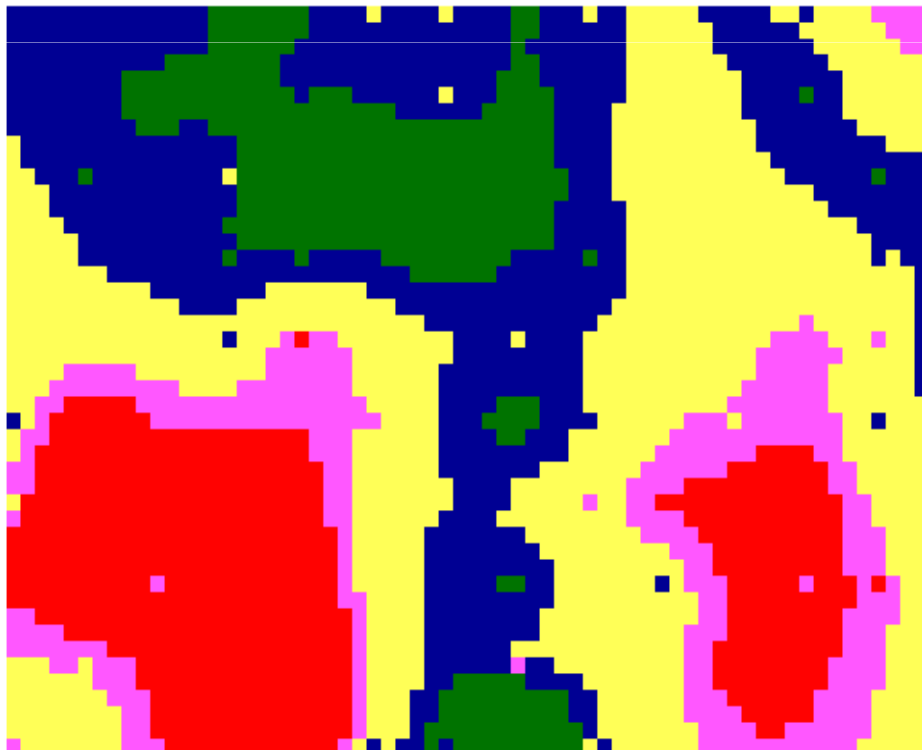
|  |           |         |
|--|-----------|---------|
|  | > 11,3    | > 80    |
|  | 9,3-11,3  | 60 - 80 |
|  | 7,1-9,3   | 40 - 60 |
|  | 6,0 - 7,1 | 20 - 40 |
|  | < 6,0     | < 20    |

Produtividade, Mg (MS) / ha

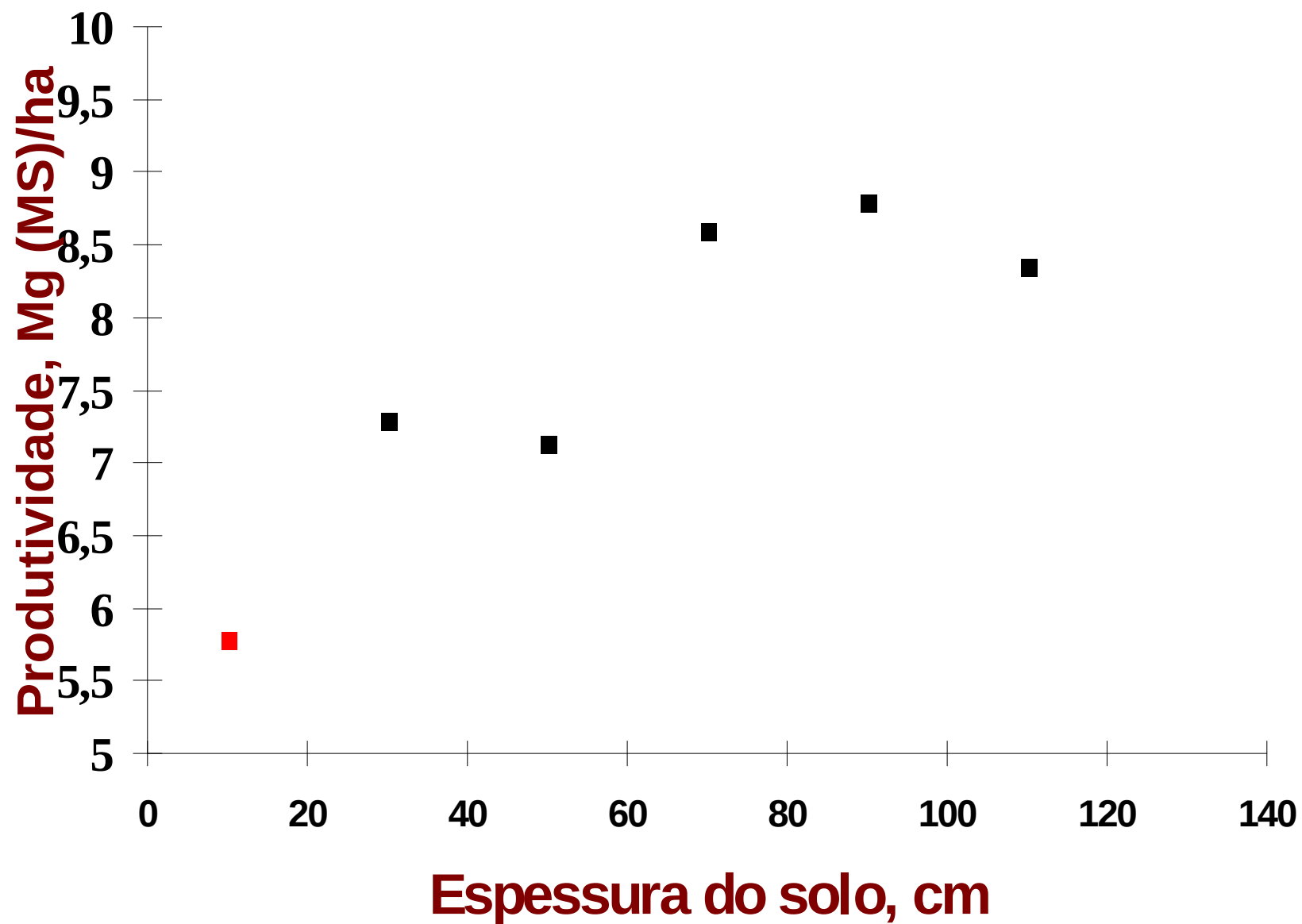
Espessura do solo, cm

50m

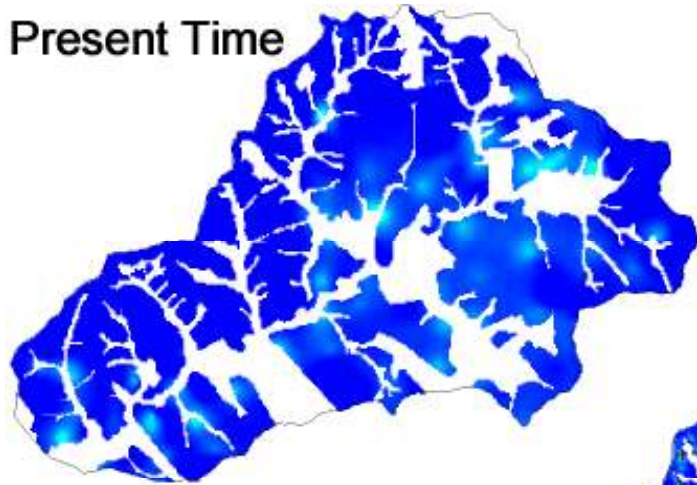
70m



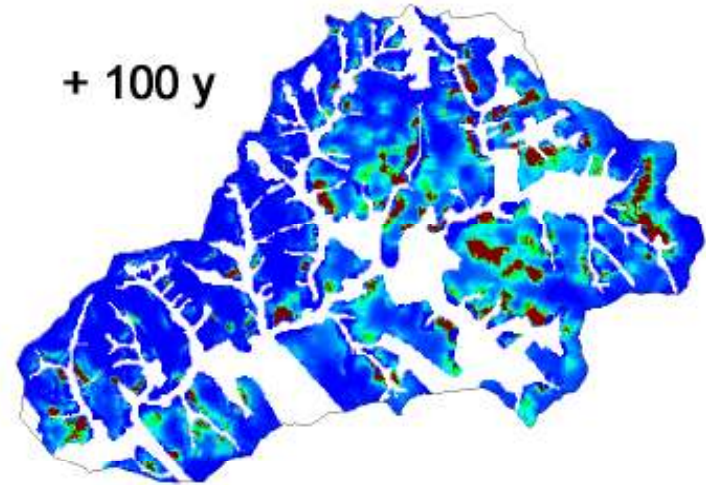
## Produtividade da Crotalária vs espessura do solo



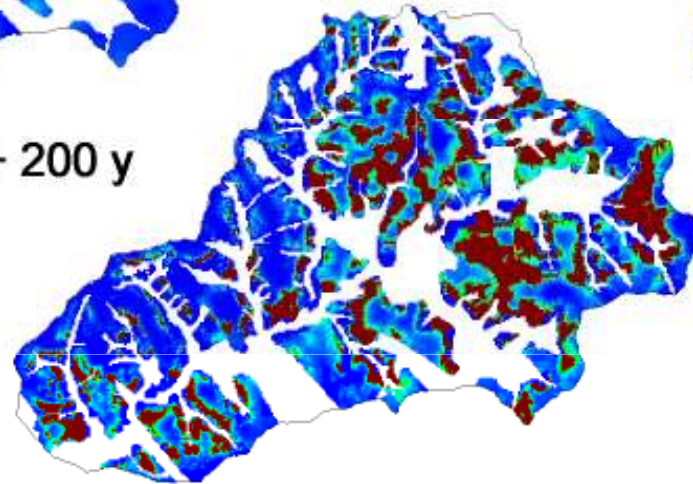
Present Time



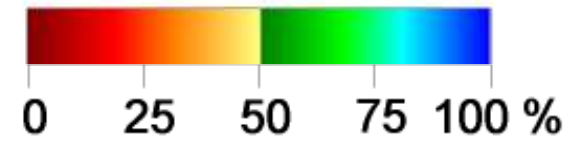
+ 100 y



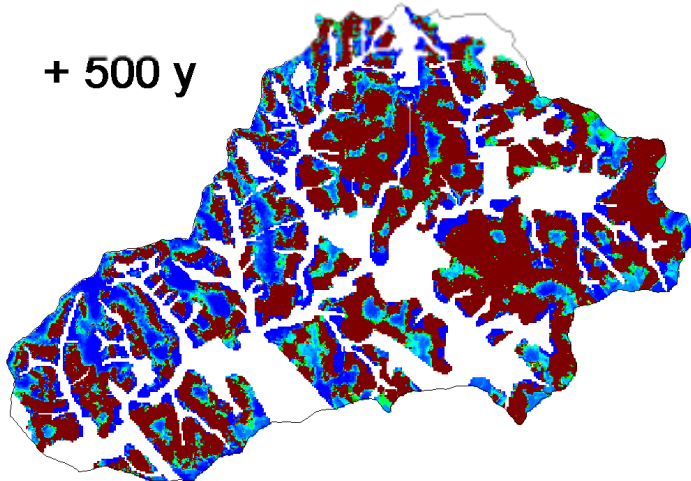
+ 200 y



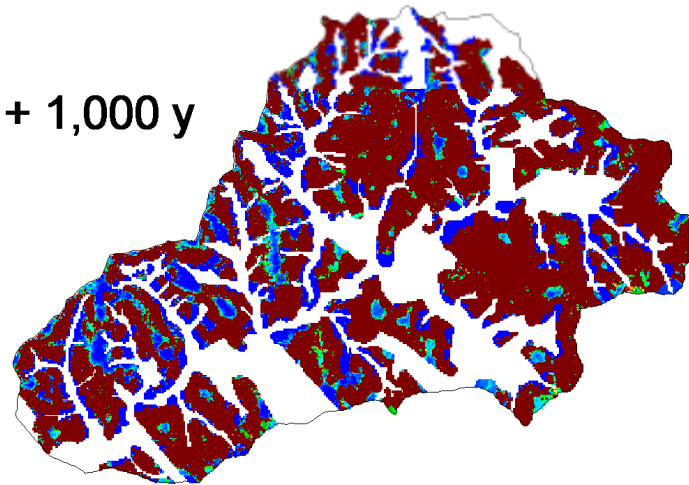
Relative yield



+ 500 y



+ 1,000 y



| Land Use                       | Area<br>ha 10 <sup>6</sup> | Proportion of:         |           |
|--------------------------------|----------------------------|------------------------|-----------|
|                                |                            | Agricultural land<br>% | Territory |
| Cultivated pasture             | 99.7                       | 43.0                   | 11.6      |
| Rangeland (natural pasture)    | 78.0                       | 33.7                   | 9.1       |
| Soybeans                       | 16.4                       | 7.1                    | 1.9       |
| Corn                           | 12.3                       | 5.3                    | 1.4       |
| Sugarcane                      | 5.2                        | 2.2                    | 0.6       |
| Beans ( <i>Phaseolus sp.</i> ) | 4.3                        | 1.9                    | 0.5       |
| Rice                           | 3.2                        | 1.4                    | 0.4       |
| Coffee                         | 2.4                        | 1.0                    | 0.3       |
| Wheat                          | 2.2                        | 0.9                    | 0.3       |
| Cassava                        | 1.7                        | 0.8                    | 0.2       |
| Orange tree                    | 0.8                        | 0.4                    | 0.1       |
| Cotton                         | 0.8                        | 0.3                    | 0.1       |
| Other agricultural land use    | 4.7                        | 2.0                    | 0.5       |
| Total                          | 231.7                      | 100.0                  | 26.9      |

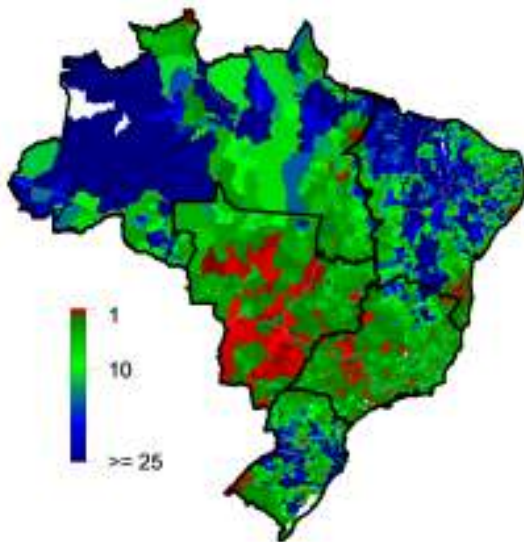
<sup>1</sup> Source: 1995/96 Census of agriculture (IBGE, 1998).<sup>2</sup> Source: Municipal agriculture production (IBGE, 2002).

# Family and industrial agriculture in Brazil

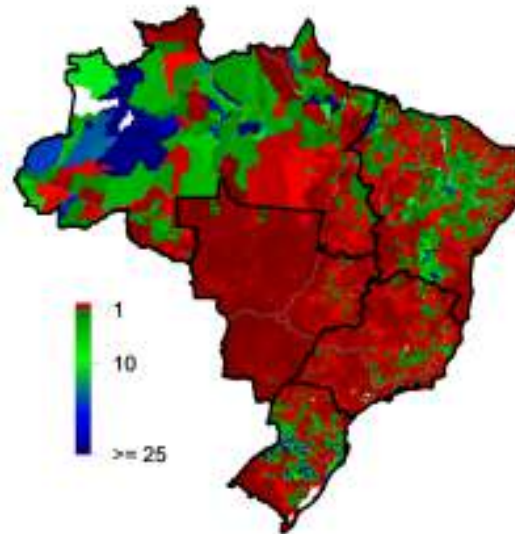
|                       | Unit                 | Family    | Industrial | Ratio<br>(larger/smaller) |
|-----------------------|----------------------|-----------|------------|---------------------------|
| Farms                 | #                    | 4,291,300 | 568,564    | 7.5                       |
| Area                  | 10 <sup>6</sup> ha   | 110       | 244        | 2.2                       |
| Part of the territory | %                    | 12.9      | 28.7       | total = 41.6              |
| Area per farm         | ha                   | 26        | 429        | 16.8                      |
| Production value      | 10 <sup>9</sup> R\$  | 18        | 29         | 1.6                       |
| Productivity          | R\$ ha <sup>-1</sup> | 168       | 121        | 1.4                       |

Source: 1995/96 Census of agriculture (IBGE, 1998)

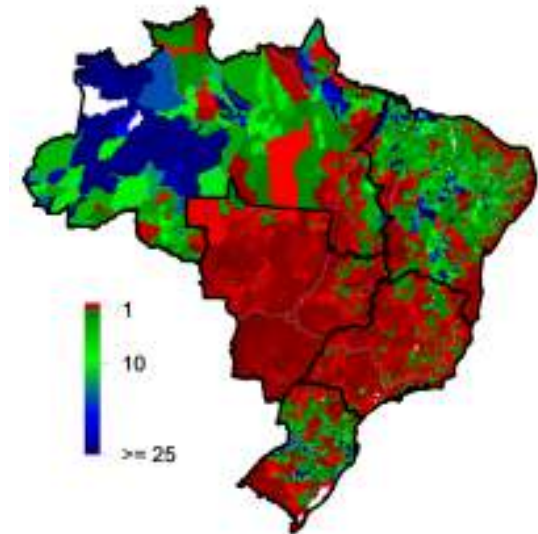
Ratio: Familiar/Commercial  
Farm Number



Ratio: Familiar/Commercial  
Total Farm Area



Ratio: Familiar/Commercial  
Production Value



## **GDP of agricultural production: 9.3%**

GDP of Family Agriculture = 3.6%

GDP of Industrial Agriculture = 5.7%

(39% Family and e 61% Industrial)

3.6% = R\$ 55,6 billions

## **GDP of agribusiness: 30.6%**

10.1% Family e 20.5% Industrial (33% Family e 67% Industrial)

Source: Guilhoto et al. 2005













 Adição

 Perda

