July 24, 1977

SUMMARY OF MAIZE YIELD REGRESSION:

1) ORIGINAL DATA SET: 224 cases

2) CULLING THE DATA SET:

a) INVALID DATA:

- field areas less than 1 hectare
- questionable data due to noted contradictions or vagueness in colonist response
- cases where soil sample did not come from location of field but from a similar nearby location with the same history
- cases with incomplete data for any of the regression variables: pH, planting density, interplanted rice density and interplanted manioc density

b) EXCLUDED CATEGORIES OF VALID DATA:

- cases reporting rat damage of intensity 3 or 4 in any stage of the life cycle
- cases with poor germination noted
- cases with disease noted

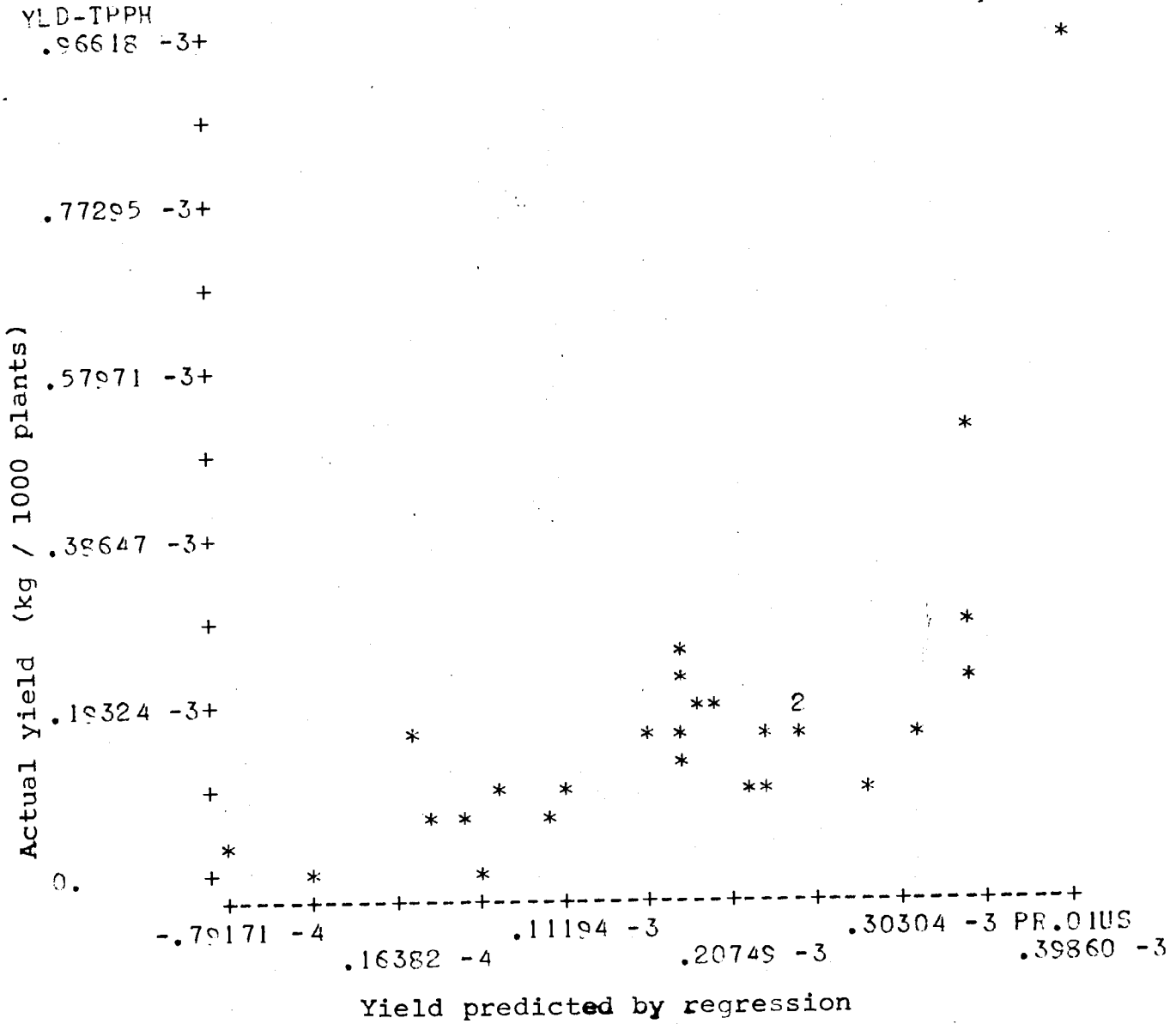
3) MAIZE YIELD REGRESSION:

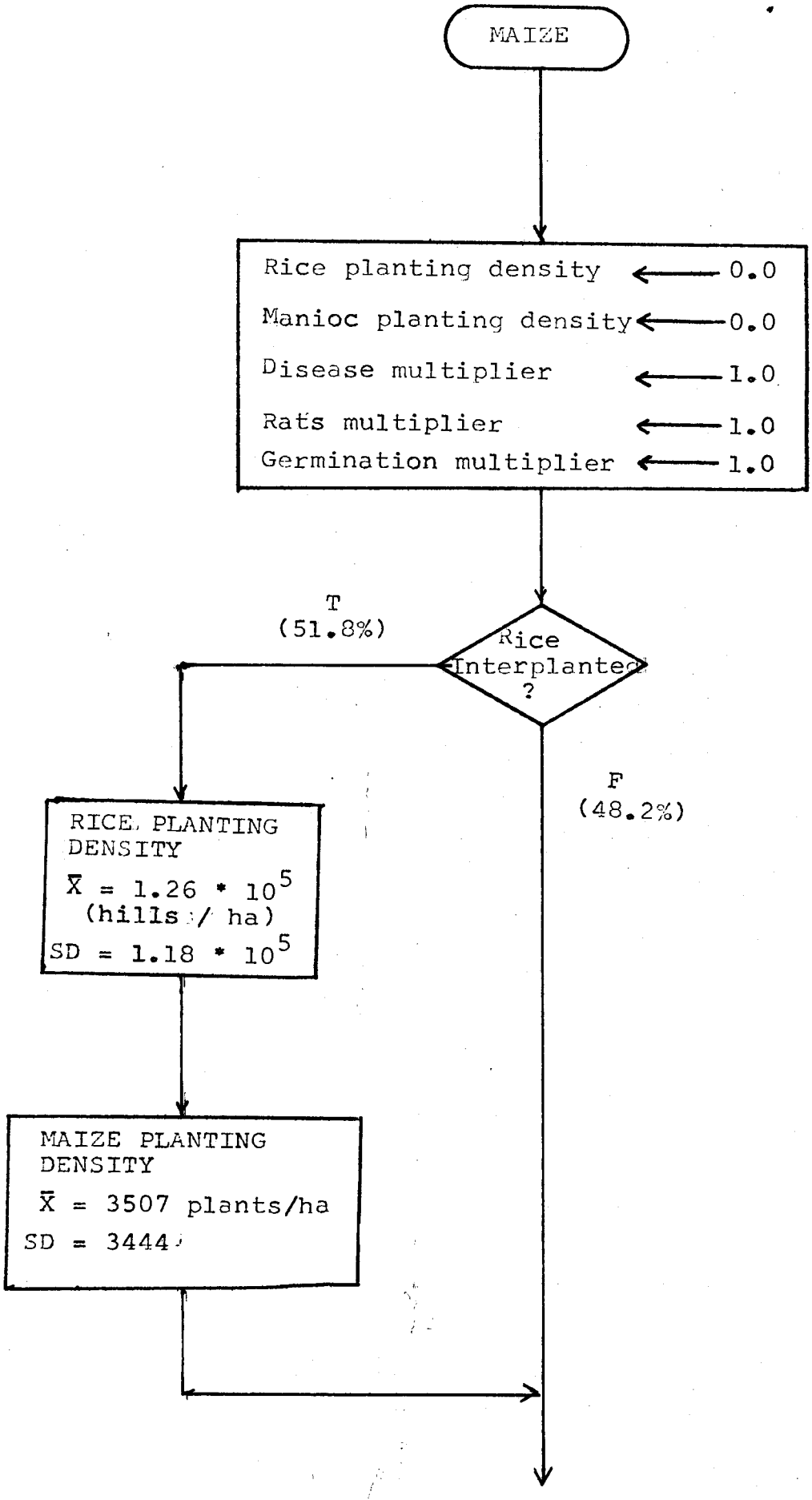
$$\text{Maize yield (kg/1000 plants)} = 1.25 * 10^{-4} * \text{pH (adjusted to 6.0)} - 2.92 * 10^{-8} * \text{Maize density (plants / Ha)} - 2.22 * 10^{-8} * \text{Manioc density (plants / ha)} - 8.16 * 10^{-10} * \text{Rice density (hills/ha)} + 3.30 * 10^{-4}$$

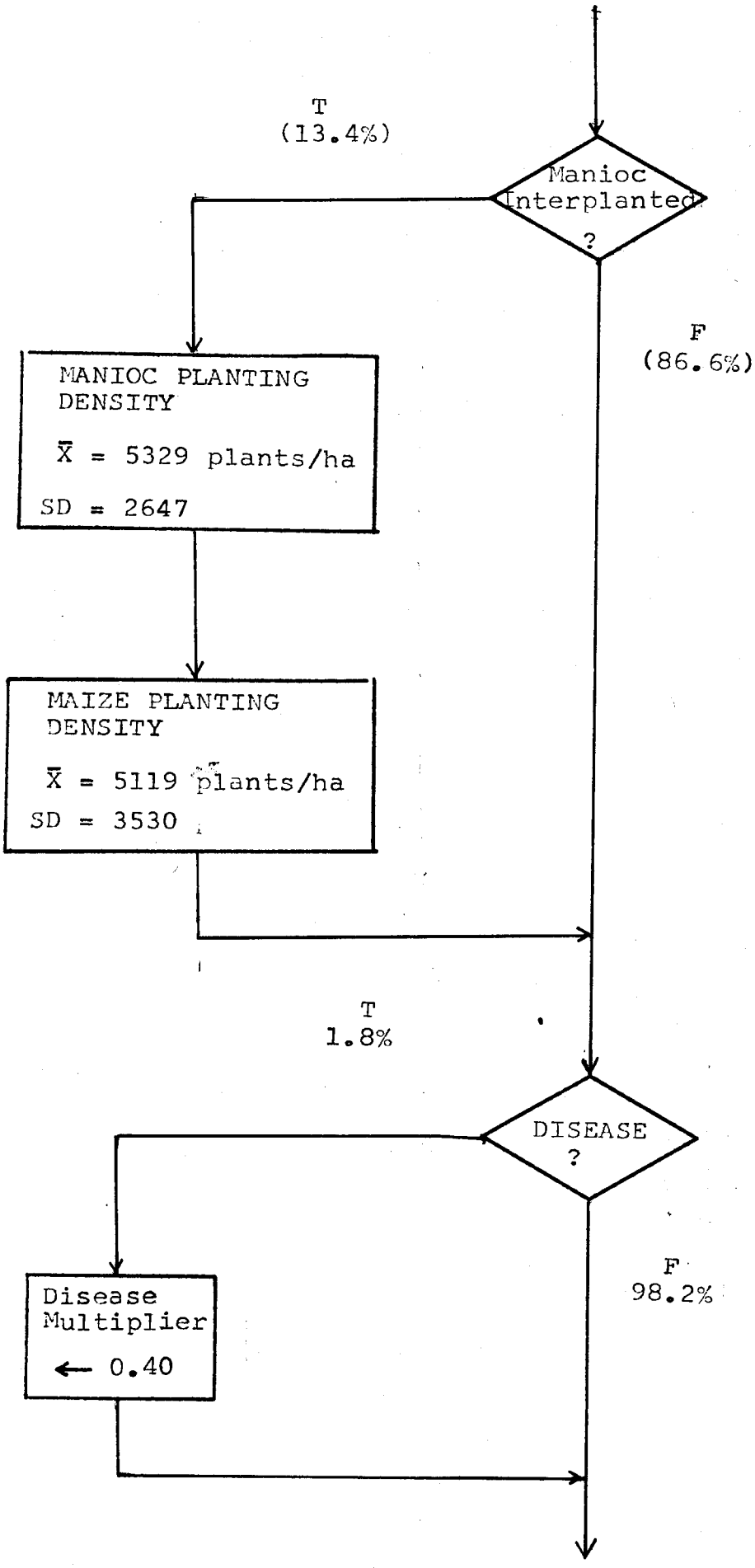
$p = 0.0109$
$r = 0.6487$
$r^2 = 0.4208$
$SE = 1.5069 * 10^{-4}$
$N = 28$

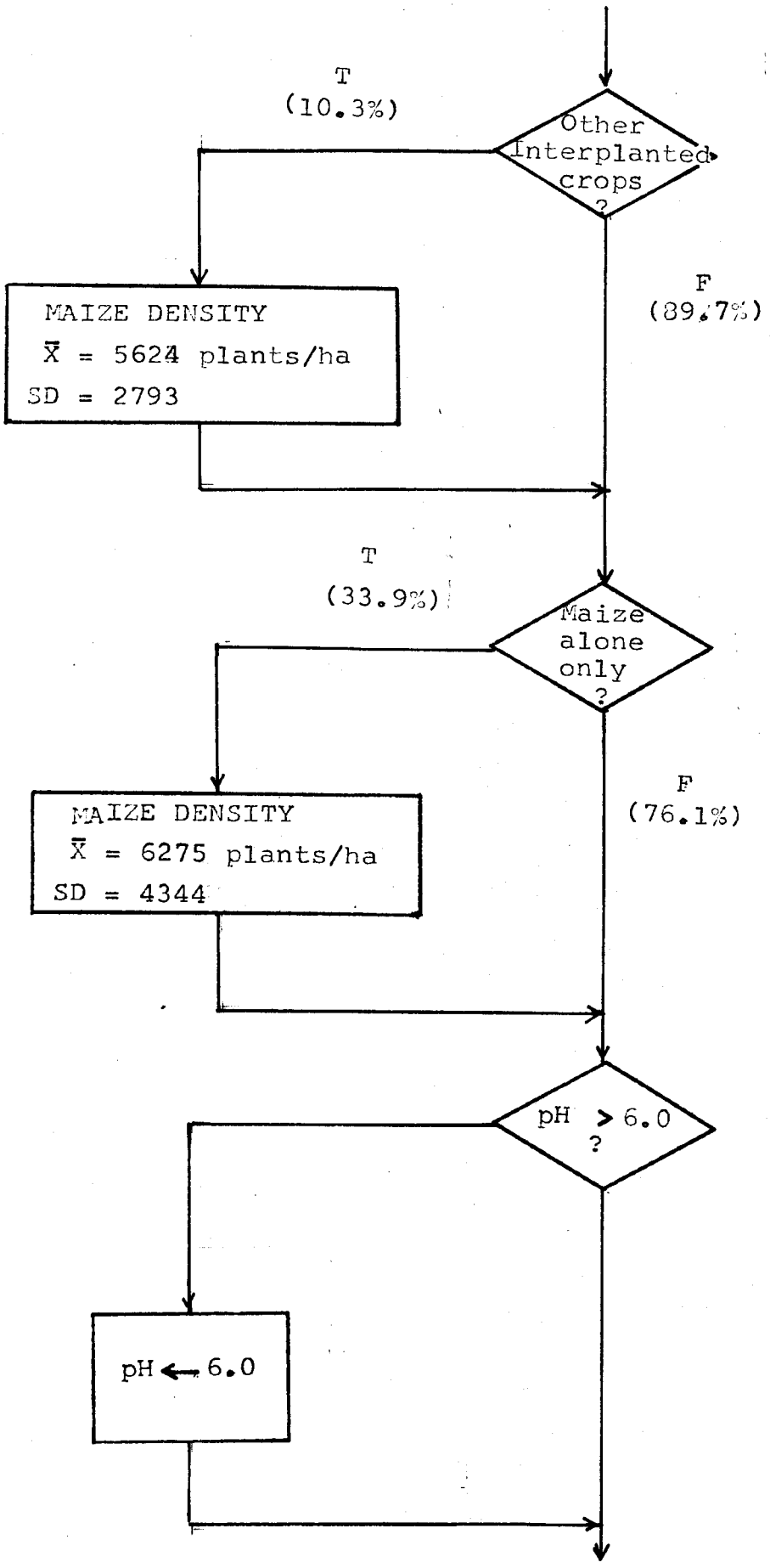
SCATTER PLØT MAIZE ACTUAL YIELDS IN KG PER THØUSAND PLANTS VS PREDICTED YIELDS FRØM REGRESSIØN ØN PH (AD.IUSTED TØ 6.0) PLANTING DENSITY - INTERPLANTED RICE DENSITY AND INTERPLANTED MANIØC DENSITY

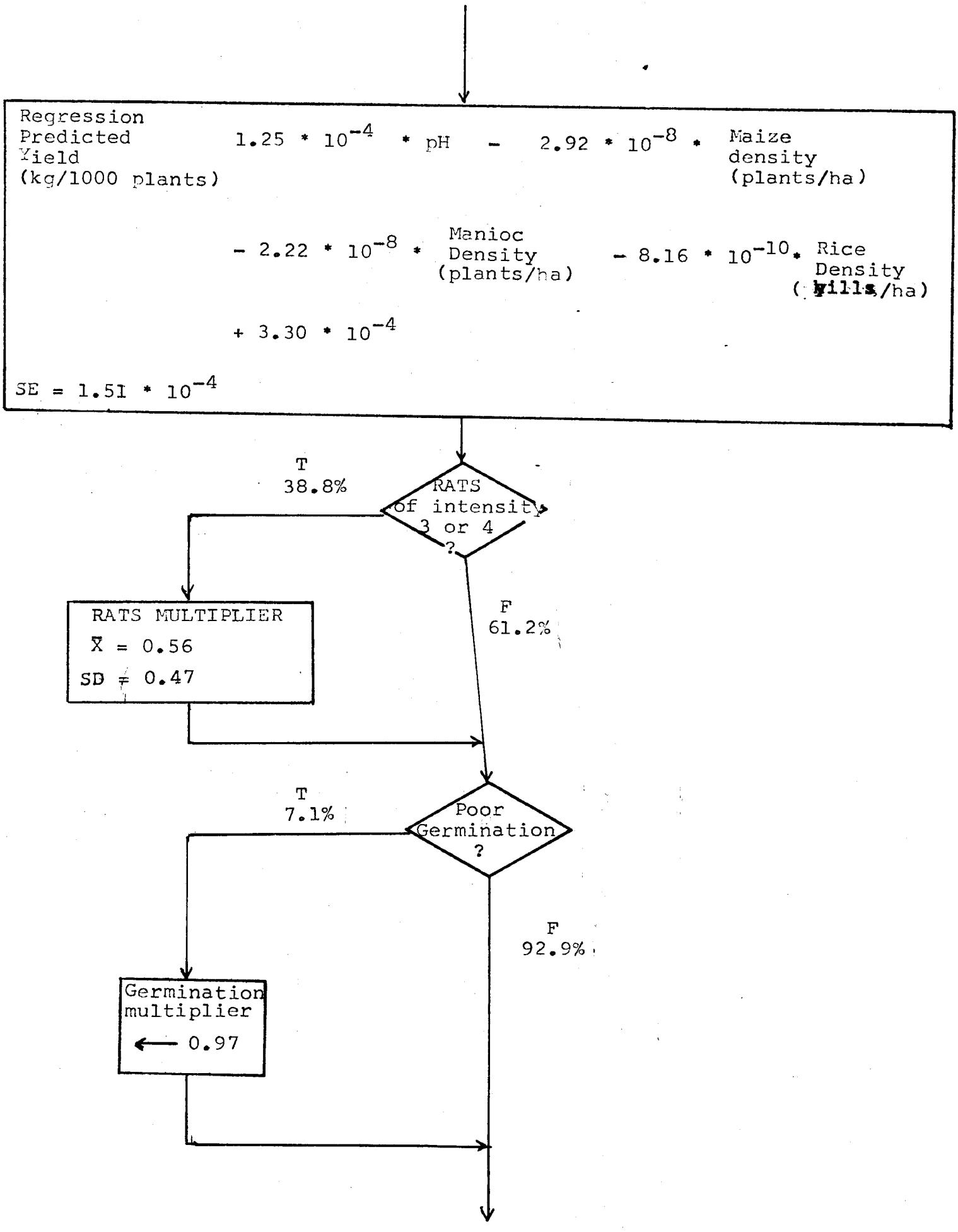
N= 28 ØUT ØF 224 9004.YLD-TPPH VS. 9811.PR.01US

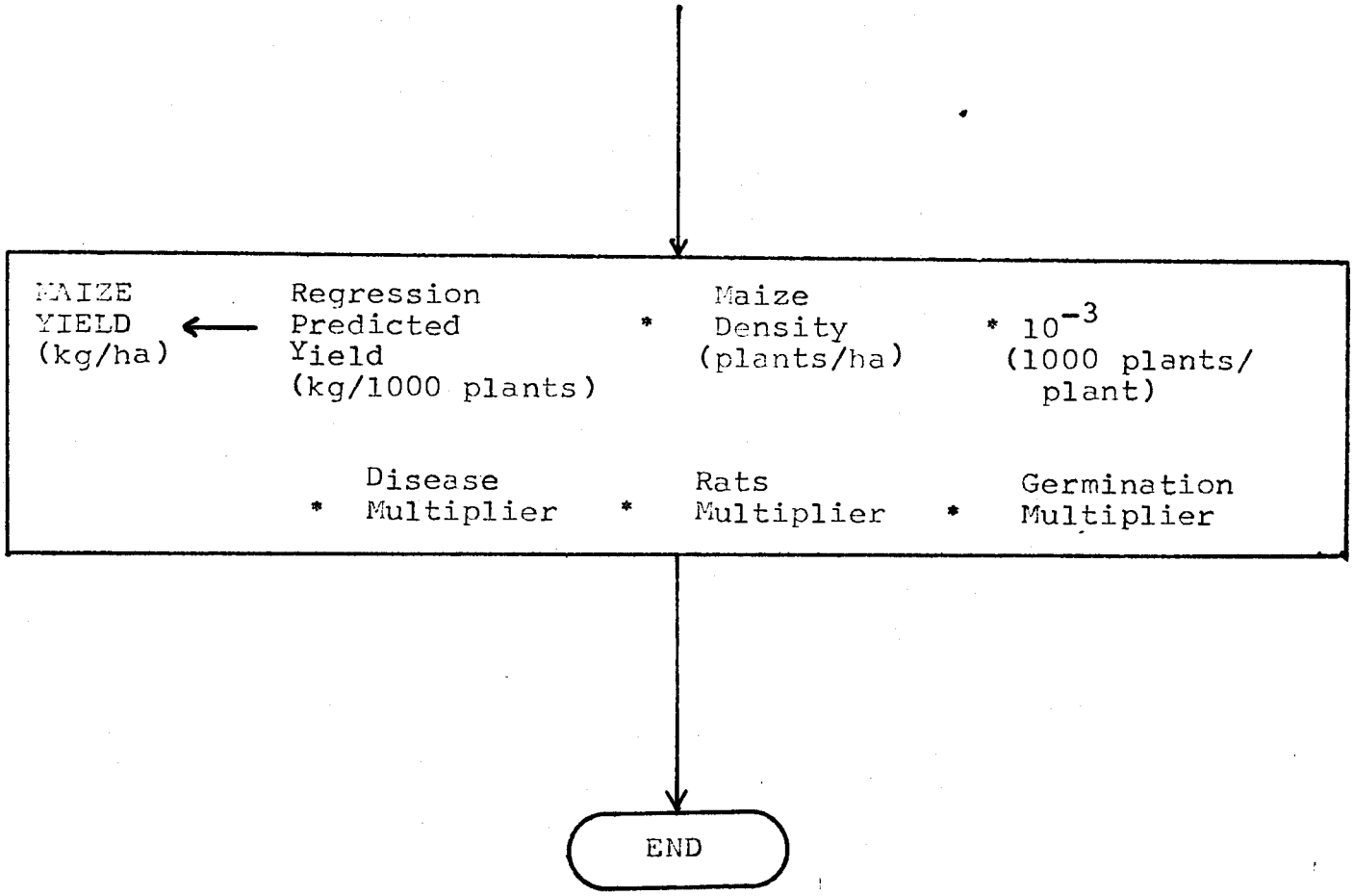



MAIZE
Rice planting density ← 0.0
Manioc planting density ← 0.0
Disease multiplier ← 1.0
Rats multiplier ← 1.0
Germination multiplier ← 1.0
T
(51.8%)
Rice Interplanted ?
F
(48.2%)
RICE PLANTING DENSITY
$\bar{X}$ = 1.26 * 10^5
(hills / ha)
SD = 1.18 * 10^5
MAIZE PLANTING DENSITY
$\bar{X}$ = 3507 plants/ha
SD = 3444


T
(13.4%)
Manioc Interplanted ?
F
(86.6%)
MANIOC PLANTING DENSITY
$\bar{X}$ = 5329 plants/ha
SD = 2647
MAIZE PLANTING DENSITY
$\bar{X}$ = 5119 plants/ha
SD = 3530
T
1.8%
DISEASE ?
F
98.2%
Disease Multiplier
← 0.40


T
(10.3%)
Other Interplanted crops ?
F
(89.7%)
MAIZE DENSITY
$\bar{X}$ = 5624 plants/ha
SD = 2793
T
(33.9%)
Maize alone only ?
F
(76.1%)
MAIZE DENSITY
$\bar{X}$ = 6275 plants/ha
SD = 4344
pH > 6.0 ?
pH ← 6.0


Regression Predicted Yield (kg/1000 plants)
1.25 * 10^-4 * pH - 2.92 * 10^-8 * Maize density (plants/ha)
- 2.22 * 10^-8 * Manioc Density (plants/ha)
- 8.16 * 10^-10 * Rice Density (hills/ha)
+ 3.30 * 10^-4
SE = 1.51 * 10^-4
T 38.8%
RATS of intensity 3 or 4 ?
F 61.2%
RATS MULTIPLIER
X̄ = 0.56
SD = 0.47
T 7.1%
Poor Germination ?
F 92.9%
Germination multiplier
← 0.97


MAIZE YIELD (kg/ha)
Regression Predicted Yield (kg/1000 plants)
* Maize Density (plants/ha)
* 10^{-3} (1000 plants/ plant)
* Disease Multiplier
* Rats Multiplier
* Germination Multiplier
END