

WTS IMPROVEMENT

OBJECTIVES: IMPROVE FLAVOR/REDUCE BURN RATE OF WTS.

BENEFITS: INCREASE THE PUFF NUMBER OF OUR PARENT BRANDS
TO THAT OF OUR COMPETITORS.

INCREASE PROFIT MARGIN THROUGH GREATER USE OF
WTS.

STRATEGY: BURN RETARDING ADDITIVES COULD AFFECT FLAVOR,
THEREFORE, THIS ASPECT OF PROJECT BEING ADDRESSED
FIRST.

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PUFF NUMBER COMPARISONS

KS

| | | | |
|---------|-----|----------|-----|
| VICEROY | 7.3 | MARLBORO | 8.2 |
| RALEIGH | 7.6 | WINSTON | 8.3 |
| KOOL | 7.5 | SALEM | 8.3 |

100

| | | | |
|---------|-----|----------|-----|
| VICEROY | 8.7 | MARLBORO | 9.5 |
| RALEIGH | 8.9 | WINSTON | 9.4 |
| KOOL | 8.2 | SALEM | 9.7 |

PHASE 1

ADD KNOWN EFFECTIVE BURN RETARDANTS TO WTS.

- 2.5% AMMONIUM CHLORIDE
- 3.0% DIAMMONIUM PHOSPHATE
- 3.0% AMMONIUM SULFAMATE
- 3.0% MAGNESIUM CHLORIDE
- 2.0% BORAX/BORIC ACID (2;1)

RESULTS: NONE OF THE ADDITIVES INCREASED RALEIGH KS PUFF NUMBER.

PHASE 2

INCREASE ADDITIVE LEVEL TO 6% ON ALL WTS LAREDO CIGARETTES.

100% WTS (450 MG/CIG)

| | |
|----------------------|------------------|
| AMMONIUM CHLORIDE | UREA-PHOSPHATE |
| DIAMMONIUM PHOSPHATE | BORAX/BORIC ACID |
| AMMONIUM SULFAMATE | POLYBORATE |
| MAGNESIUM CHLORIDE | AMMONIUM SULFATE |
| UREA | LITHIUM FORMATE |

RESULTS: THE ADDITIVES CAUSED ONLY A ONE PUFF INCREASE OVER UNTREATED WTS (3 PUFFS - 4).

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PHASE 3

TEST SAME ADDITIVES AT SAME LEVELS ON ALL LNB LAREDO CIGARETTES.

100% LNB (350 mg/cig)

| <u>ADDITIVE</u> | <u>PUFFS</u> | <u>ADDITIVE</u> | <u>PUFFS</u> |
|----------------------|--------------|------------------|--------------|
| NONE | 4.0 | UREA | 5.0 |
| AMMONIUM CHLORIDE | 7.5* | UREA-PHOSPHATE | 5.5 |
| DIAMMONIUM PHOSPHATE | 5.0 | BORAX/BORIC ACID | 4.0 |
| AMMONIUM SULFAMATE | 7.0* | POLYBORATE | 5.0 |
| MAGNESIUM CHLORIDE | 8.0* | AMMONIUM SULFATE | 6.0 |
| | | LITHIUM FORMATE | 4.0 |

*REQUIRED FREQUENT RELIGHTING.

PHASE 4

TEST RESULTS WITH DEVELOPMENT CENTER CIGARETTES.

PRODUCTION WTS (CURRENT RALEIGH KS)

FC WTS/LNB

6% AMMONIUM CHLORIDE ACROSS FC WTS/LNB MIX

6% AMMONIUM SULFAMATE ACROSS FC WTS/LNB MIX

6% MAGNESIUM CHLORIDE ACROSS FC WTS/LNB MIX

6% MAGNESIUM CHLORIDE ON LNB PORTION ONLY

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SUMMARY

DEEP CONCERN OVER THE LOW PUFF NUMBERS OF OUR PARENT BRANDS SOUGHT EARLY SOLUTION AND EARLY IMPLEMENTATION. ADDITION OF KNOWN EFFECTIVE BURN RETARDANTS TO WTS SEEMED TO BE OBVIOUS QUICK SOLUTION, BUT FAILED. LAB TESTS USING LAREDO CIGARETTES WITH 100% PRODUCTION WTS AND WITH 100% LNB SHOWED NITRATE COUNTERACTING THE EFFECT OF THE RETARDANTS. THREE CANDIDATE RETARDANTS WILL BE EVALUATED IN DC CIGARETTES. IMPLEMENTATION OF POSITIVE RESULTS WILL BE DEPENDENT ON SENSORY EFFECTS AND LNB START-UP IN MACON.

FUTURE WORK

SENSORY EVALUATIONS
OPTIMIZE ADDITIVE LEVEL
BEGIN FLAVOR IMPROVEMENT
IMPLEMENT RETARDANT ADDITIVES MACON ASAP

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