



MODERN REGIONAL GRANULATION IN EASTERN EUROPE

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Case Study Involvement by Virgis
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PAST GRANULATION IN THE USA

- ❖ INTRODUCTION OF REGIONAL GRANULATION PLANTS IN THE EARLY 1900'S
- ❖ AVAILABILITY OF STANDARD GRADE FERTILIZER MATERIALS AND LIQUID INGREDIENTS
- ❖ NEED FOR HOMOGENEOUS MIXTURE THAT COULD BE EASILY HANDLED AND SPREAD
- ❖ DRUM GRANULATION ANSWERED THESE NEEDS
- ❖ PRODUCTION RUNS OF LOW ANALYSIS GRADES SUCH AS TRIPLE 8 , 3-9-18, AND 4-12-12
- ❖ MID-1960'S GRANULAR MATERIALS SUCH AS MAP AND DAP BECAME READILY AVAILABLE
- ❖ BULK BLENDING DOMINATED GRANULATION

Europe



WESTERN EUROPEAN MARKET

- ❖ LARGE DEMAND FOR HOMOGENEOUS NPK FERTILIZERS
- ❖ LARGE SCALE GRANULATION PLANTS DEVELOPED BEFORE GRANULATION IN THE USA AND CONTINUE TODAY
- ❖ FACILITIES PRODUCING UP TO 2 M TONS OF NPKS PER YEAR
- ❖ VERY LARGE PRODUCTION RUNS WITH NO ECONOMIC DRIVE TO MEET NICHE MARKETS
- ❖ SLOWLY INCREASING BULK BLENDING MARKET



EASTERN EUROPEAN MARKET

- ❖ LITTLE DEVELOPMENT OF BULK BLENDING DUE TO LACK OF AVAILABILITY OF GOOD PHYSICAL QUALITY INGREDIENTS OR EFFICIENT SPREADING EQUIPMENT
- ❖ TRADITION FOR HOMOGENEOUS FERTILIZERS
- ❖ HIGH PRICED EXPORT MARKETS FOR ANY QUALITY GRANULAR INGREDIENTS
- ❖ AVAILABILITY OF BASIC NON-GRANULAR MATERIALS
- ❖ RELATIVELY INEXPENSIVE ON A “PER UNIT NUTRIENT BASIS”
- ❖ GRANULAR NPKS FROM REGIONAL GRANULATION PLANTS MORE ECONOMICAL



ADDITIONAL NEEDS OF EASTERN EUROPEAN FERTILIZER MARKET

- ❖ SPECIFIC FORMULATIONS MEETING NEEDS OF NICHE MARKETS
- ❖ SULFUR
- ❖ MICRO-INGREDIENTS
- ❖ COST EFFECTIVE



SOLUTION

- ❖ INTRODUCTION OF A REGIONAL GRANULATION PLANT
- ❖ INCORPORATE MAXIMUM FLEXABILITY
- ❖ MEET THE NEEDS OF NICHE MARKETS
- ❖ SIMPLICITY OF OPERATION WITH AUTOMATIC CONTROL



VARIABLES FOR THE GRANULATION PLANT

- ❖ DRY RAW MATERIALS
- ❖ LIQUID CHEMICAL AVAILABILITY AND TYPE
- ❖ MARKET NEEDS
- ❖ OPERATOR EXPERIENCE




HOW DO YOU INCORPORATE THESE VARIABLES

- ❖ NUMEROUS GRANULATION METHODS
- ❖ AUTOMATION
- ❖ SIMPLICITY



GRANULATION METHODS

- ❖ CHEMICAL GRANULATION
- ❖ STEAM GRANULATION
- ❖ BINDER GRANULATION



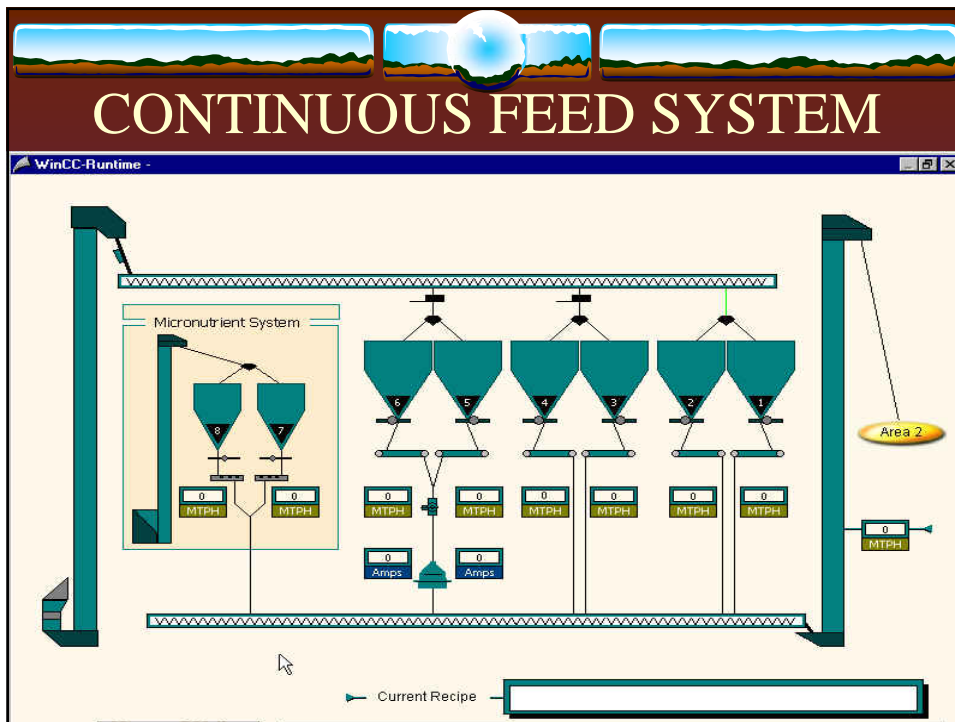
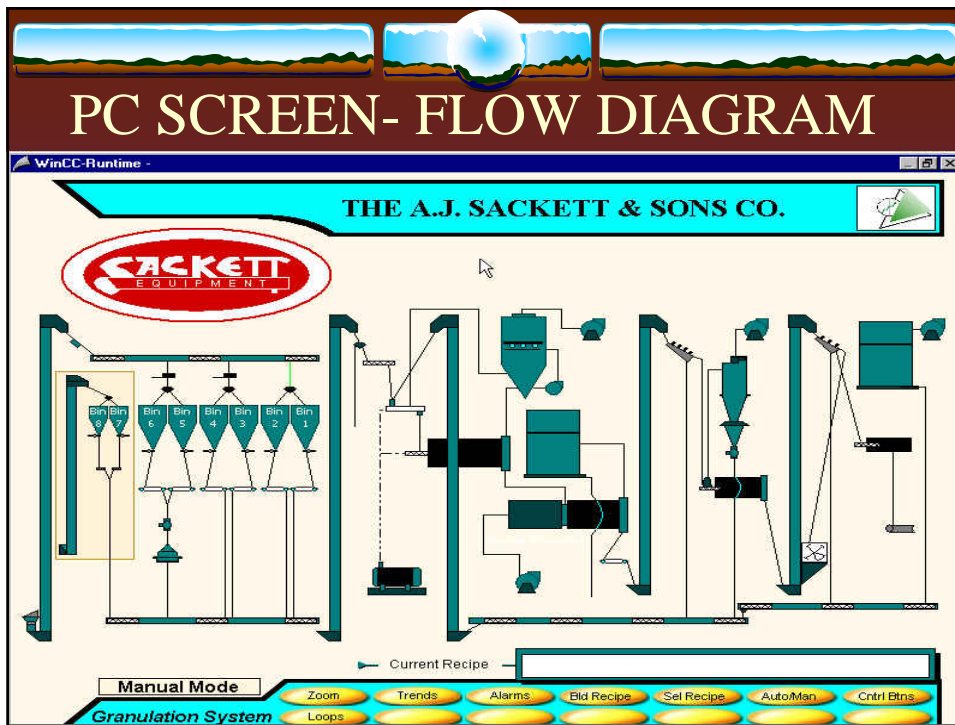
AUTOMATION

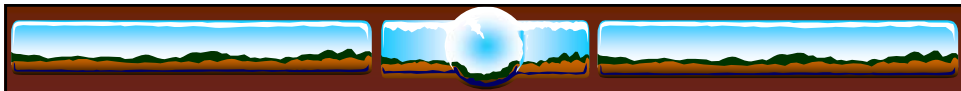
- ❖ PLC WITH PC INTERFACE
- ❖ OPTIONAL COMPLETE MANUAL BACKUP
- ❖ AUTOMATIC LIQUID AND DRY DOSING FROM RECIPE
- ❖ MONITORING AND ADJUSTMENT FOR RECYCLE RATE
- ❖ AUTOMATIC COATING APPLICATION
- ❖ ADVANCED ALARM AND INTERLOCK SYSTEM



SIMPLICITY


- ❖ DRUM GRANULATION
- ❖ ROTARY DRYING/COOLING
- ❖ VIBRATING SCREENS
- ❖ STANDARD RECYCLE LOOP





BENEFITS

- ❖ AUTOMATIC CONTROL OF DRY INGREDIENTS
- ❖ HIGHLY ACCURATE
- ❖ COMPUTER MONITORING OF FLOW TRENDS
- ❖ DATABASE STORAGE OF MATERIALS
- ❖ PROCESS ALARMS



RECIPE BUILDER

Return To HMI Tons per hour:

Recipe Number: Recipe Name: Go to Recipe Number:

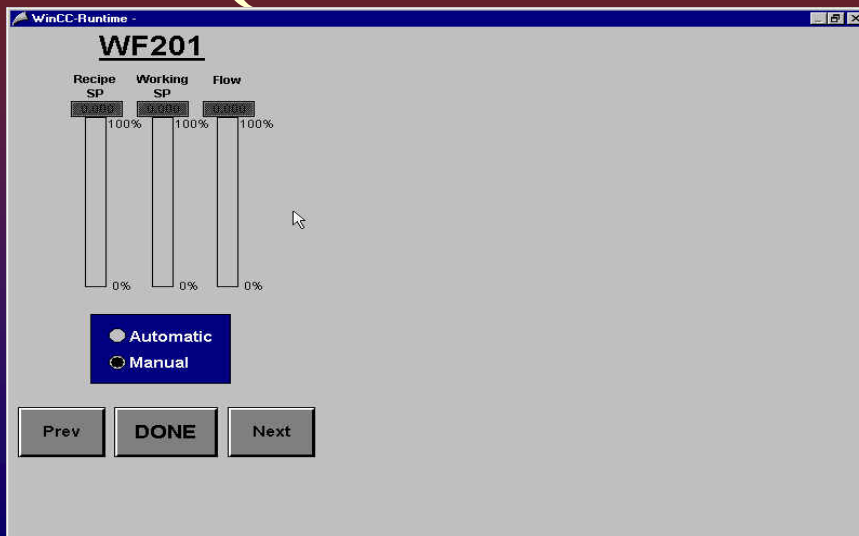
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Weigh Belt 1 Feed Rate SP <input type="text" value="1.1"/>	Weigh Belt 2 Feed Rate SP <input type="text" value="2.2"/>	Weigh Belt 3 Feed Rate SP <input type="text" value="3.3"/>	Weigh Belt 4 Feed Rate SP <input type="text" value="4.4"/>
Hopper 5 Product <input type="text" value="Ingredient5"/>	Hopper 6 Product <input type="text" value="Ingredient6"/>	Hopper 7 Product <input type="text" value="Ingredient7"/>	Hopper 8 Product <input type="text" value="Ingredient1"/>
Weigh Belt 5 Feed Rate SP <input type="text" value="5.5"/>	Weigh Belt 6 Feed Rate SP <input type="text" value="6.6"/>	Weigh Belt 7 Feed Rate SP <input type="text" value="7.7"/>	Weigh Belt 8 Feed Rate SP <input type="text" value="8.8"/>


Mixer Water Amount <input type="text" value="1.200"/>	Acid Amount <input type="text" value="3.400"/>	Granulator Water Amount <input type="text" value="5.600"/>	Dryer Temp SP <input type="text" value="88"/>
Mixer Steam Amount <input type="text" value="2.300"/>	Ammonia Amount <input type="text" value="4.500"/>	Granulator Steam Amount <input type="text" value="6.700"/>	Dryer Alarm Dev % <input type="text" value="9"/>
			Max Reclaim Tons/hour <input type="text" value="10.10"/>

MAXIMUM FLEXIBILITY

- ❖ QUICK FORMULA CHANGE
- ❖ ADJUSTMENT OF THROUGHPUT
- ❖ FINE TUNNING FOR OFF SPEC PRODUCT

LIQUID ADDITIONS





RECYCLE SYSTEM

- ❖ CONTINUOUSLY MONITORED RECYCLE RATE
- ❖ AUTOMATIC ADDITION OF STEAM AND WATER
- ❖ AUTOMATIC PLANT TURNDOWN



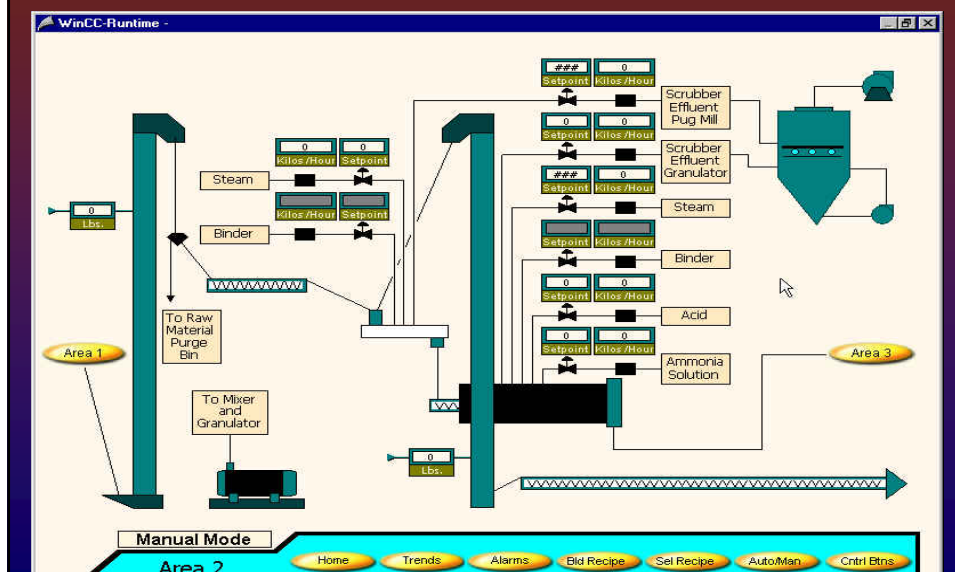
COATING SYSTEM

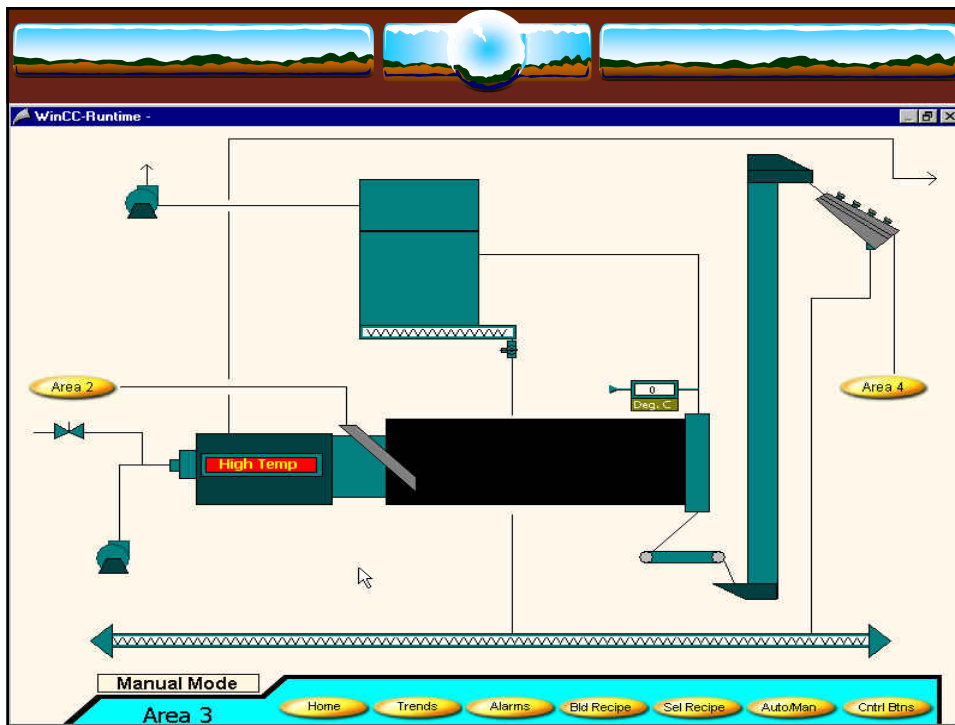
- ❖ CONTINUOUS MONITORING OF PRODUCT RATE
- ❖ LOGIC TO CONTROL COATING AGENT BASED ON % OF PRODUCT RATE
- ❖ INSURE CORRECT DOSAGE

PLANT MONITORING

- ❖ CRITICAL MOTOR AMPS/OVERLOADS
- ❖ BURNER SYSTEM
- ❖ INTERLOCK EMERGENCY SHUTDOWN
- ❖ DIFFERENTIAL PRESSURES FOR DUST COLLECTORS AND SCRUBBERS
- ❖ ALL DRY MATERIAL AND LIQUID FLOW RATES
- ❖ TRENDS


SAMPLE SCREEN






OPERATION

- ❖ START-UP OF EQUIPMENT
- ❖ CHOOSE/START RECIPE
- ❖ KEEP BINS FULL(LIVEL INDICATORS)
- ❖ MONITOR GRANULATION



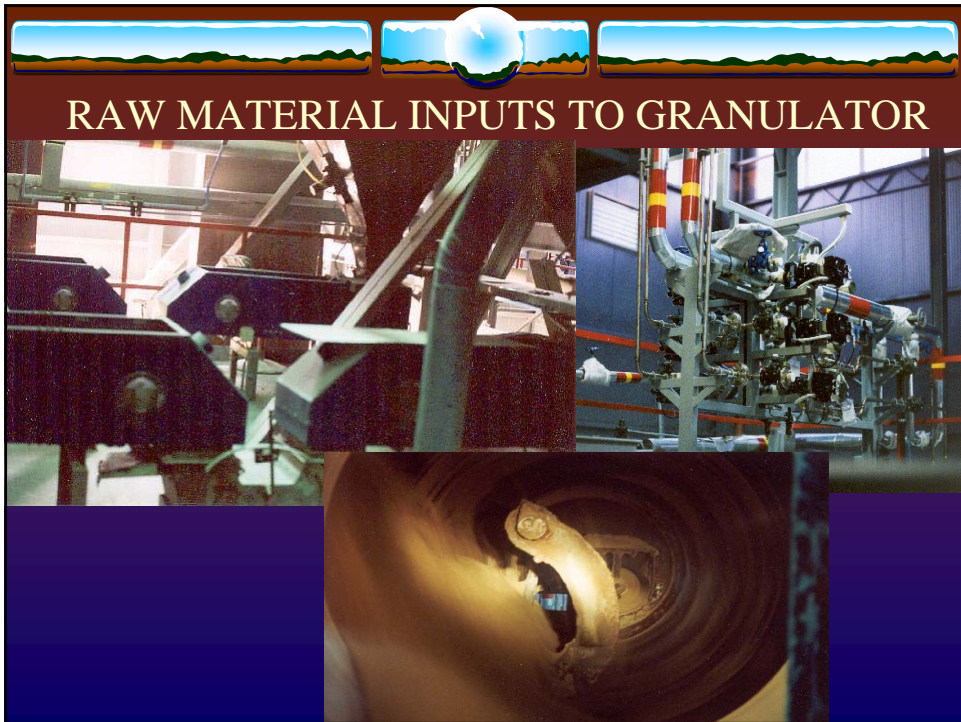
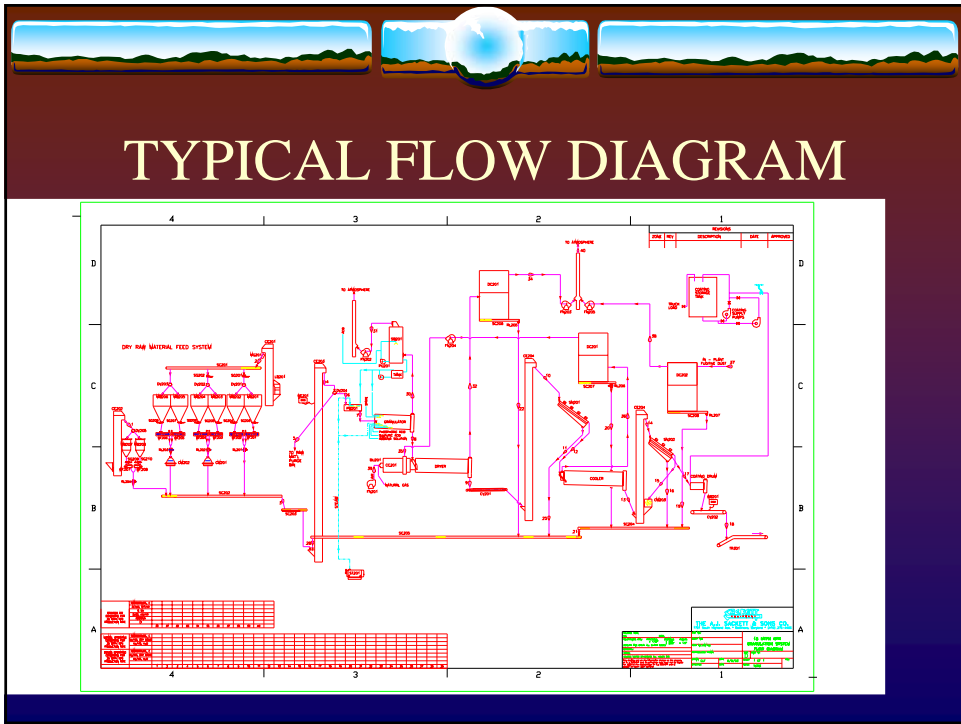
COMPLETE POLLUTION CONTROL

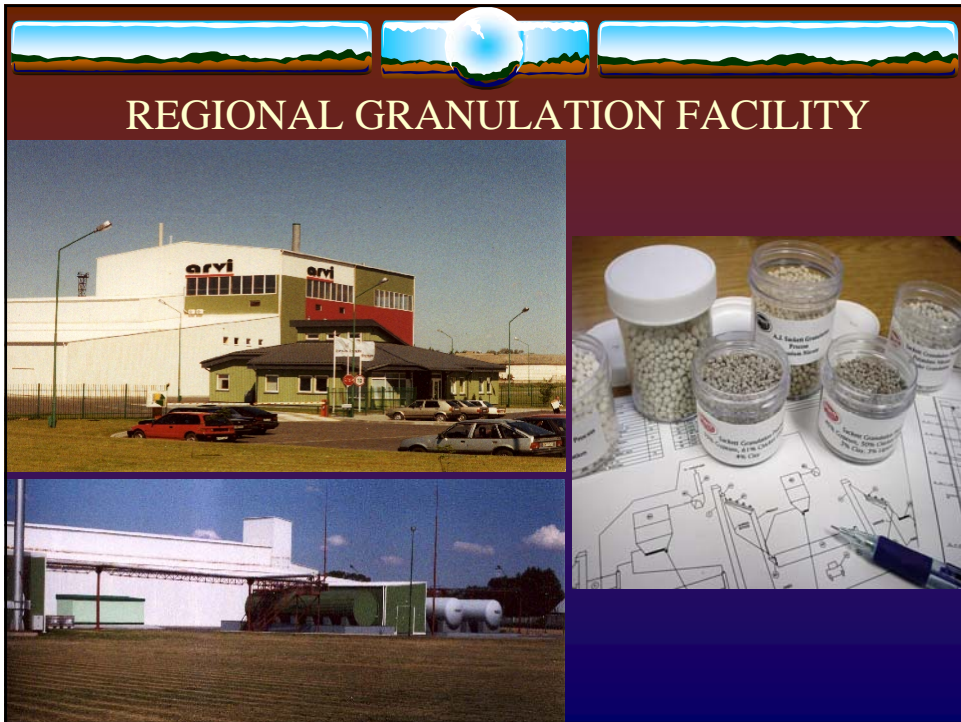
- ❖ Control of particulate and chemical emissions with closed loop process
- ❖ Extensive in-plant fugitive dust system



CONCLUSION

- ❖ MODERN GRANULATION PLANTS CAN OVERCOME THE PROBLEMS ASSOCIATED WITH FERTILIZER MARKETS IN DEVELOPING COUNTRIES
- ❖ HIGH QUALITY HOMOGENEOUS FERTILIZER WITH MAXIMUM FLEXIBILITY
- ❖ MODERN CONTROL MINIMIZES NECESSARY EXPERIENCE
- ❖ CONTROLS MINIMIZE WASTED MATERIAL
- ❖ RESULT IS SIMPLE, ECONOMICAL, AND PRODUCTIVE OPERATION OF A REGIONAL GRANULATION PLANT THRIVING IN TODAY'S NICHE MARKET







SAMPLES OF FERTILIZER PRODUCED

- ❖ NPK 17-10-14 +S11
- ❖ NPK 17-6-14 +S13
- ❖ NPK 17-6-11+S13+Mg0,2+B0,02
- ❖ NPK 8-20-30+S3+Zn0,015
- ❖ NPK 10-20-20+S5
- ❖ NPK 6-18-34+S2
- ❖ NPK 12-11-22+S6+Na2,5+Ba1,5
- ❖ NPK 12-8-19+S8+Na5+B0,15
- ❖ NPK 13-10-15+S16+Mg1,5+B0,02
- ❖ NPK 11-9-20+S16+Mg0,15+B0,02



EFFICIENT, FLEXIBLE MODERN REGIONAL NPK GRANULATION PLANTS

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