

# GREEN AUTOMATION – AUTOMATION SYSTEMS

THE ADVANTAGES OF GREEN AUTOMATION'S NFT HYDROPONIC GROWING METHODS ARE INDISPUTABLE. THEY ARE SIMPLE, LABOUR AND COST SAVING AND ENVIRONMENTALLY FRIENDLY.

TRADITIONALLY THE GROWING GUTTERS ARE PLACED STATIONARY ON THE GROWING AREA. THE DISTANCE BETWEEN GROWING GUTTERS IS DEFINED BY HOW MUCH SPACE A FULLY GROWN PLANT TAKES, WHICH MEANS INEFFICIENT USE OF SPACE IN GREENHOUSES.



IN GREEN AUTOMATION GROWING METHOD THE GUTTERS ARE PLACED BY THE NEED OF THE SPACE WHICH THE PLANT REQUIRES IN DIFFERENT STAGES OF THE GROWTH. THE PICKING AND PACKING OF THE PLANTS ARE PLACED ALWAYS ON THE OTHER END OF THE GROWING AREA OR IN FULLY AUTOMATED SYSTEM THE PACKING IS CENTRALIZED IN ONE PLACE. THE GUTTERS ARE MOVED TOWARDS THE PACKING END SIMULTANEOUSLY INCREASING THE DISTANCE BETWEEN THE GUTTERS BY THE NEED OF SPACE WHICH THE PLANT NEEDS. THIS PRINCIPLE CAUSES EXTENSIVE ADVANTAGES.

## ADVANTAGES:

- EFFICIENT USE OF GREENHOUSE, TYPICALLY 30-40 % MORE PLANTS PER SQUARE METER:
  - LESS HEATING/COOLING IS NEEDED.
  - LESS ARTIFICIAL LIGHTING IS NEEDED.
  - INVESTMENTS ON GREENHOUSE TECHNOLOGY AND IRRIGATION SYSTEMS GIVE OUT BETTER PROFITS.
- EASY MANAGEABLE MATERIAL FLOW:
  - EFFICIENT USE OF GROWING AREA, ONLY NARROW MAINTENANCE PASSAGES ARE NEEDED.
- PRODUCTION IS EASY TO UPGRADE AND AUTOMATE: ALL WORK PHASES ARE MADE IN SMALL AREAS IN PLANTING AND PACKING ENDS.
- EFFECTIVE USE OF GREENHOUSES IS EASY. INVESTMENTS ON NEW GREEN HOUSES AND GROWING LINES ARE EASY TO DO ALSO IN THE LONG TIME SCALE DUE TO EASY MANAGEABLE MATERIAL FLOWS.
- PREDICTABLE, RELIABLE HARVEST 365 DAYS PER YEAR.
- HIGH AUTOMATION LEVEL SAVES IN LABOUR COSTS AND PREVENTS HUMAN ERRORS IN GROWING PROCESS.



400-1500 PLANTS PER SQUARE METERS IN AN YEAR IS GAINED USING GREEN AUTOMATION GROWING TECHNOLOGY EVEN IN COLD AND EXTREME CONDITIONS IN NORDIC AREA.



## FEATURES

TYPICALLY THE GREEN AUTOMATION GROWING SYSTEM CONSISTS OF THE GROWING LINE, IRRIGATION SYSTEM, PLANT SECTION (NURSERY) AND IRRIGATION BOOM. ALSO OTHER EQUIPMENT, LIKE GERMINATION CHAMBERS, PLANT TRAY AND GUTTER WASHERS, CONVEYORS, SOWING LINES AND PACKING LINES ARE AVAILABLE.

THE DESIGNING OF THE GROWING SYSTEM IS ALWAYS DONE ACCORDING TO CUSTOMERS NEEDS. WE CAN HELP YOU WITH DIMENSIONING, FOR EXAMPLE THE NEEDED GUTTER SPACING IN GROWING LINE IN DIFFERENT GROWTH STAGES IS BASED UPON OUR KNOWLEDGE GAINED FROM OVER 20 YEARS OF EXPERIENCE IN LETTUCES AND HERBS PRODUCTION; A METHOD THAT GUARANTEES MAXIMAL OUTPUT WITH ALL DIFFERENT PLANT VARIETIES. ALSO PERSONNEL TRAINING FOR YOUR NEW INVESTMENT CAN BE DONE IN SOME OF OUR OWN PRODUCTION FACILITIES. THIS EXPERIENCE MAKES GREEN AUTOMATION THE ULTIMATE PARTNER IN GREENHOUSE TECHNOLOGY.

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ALL THE COMPONENTS ON GROWING SYSTEM ARE MANUFACTURED OF THE FINEST STAINLESS AND HOT DIP GALVANIZED STEEL AND ANODIZED ALUMINIUM WITH EXCELLENT CORROSION RESISTIVITY IN THE DEMANDING GREENHOUSE ENVIRONMENT. ALL CONSTRUCTIONS ARE SPECIALLY DEVELOPED AND OPTIMIZED TO MEET THE SPECIFIED NEEDS OF THE GROWING PROCESS. HIGH HYGIENE LEVEL IS ESPECIALLY TAKEN IN CONCERN. THE TRANSFER MECHANISMS, IRRIGATION SYSTEM AND OTHER AUTOMATION SYSTEMS ARE CONTROLLED BY INDUSTRIAL SOFTWARE PLC SYSTEM, WHICH REPRESENTS THE LATEST TECHNOLOGY. THIS ENSURES EASY INTEGRATION TO THE UPPER LEVEL GREENHOUSE AUTOMATION SYSTEMS.



IN THE IRRIGATION SYSTEM THE WATER IS DOSED TO THE GUTTERS FROM PRESSURE COMPENSATED DRIP EMITTERS. WATER FLOWS FROM THE GUTTERS TO THE CIRCULATION WATER TANKS, WHICH ARE PLACED UNDER THE GROWING LINE. FROM THE TANKS THE WATER IS PUMPED TO THE FULLY AUTOMATIC FILTRATION SYSTEM. PRESSURE DIFFERENCE IS MONITORED AND THE CLEANING CYCLE IS DONE AUTOMATICALLY ONLY WHEN NEEDED. CLEANING OF THE FILTRATION SYSTEM IS DONE WITH FRESH WATER. THIS SAVES FERTILIZERS AND EXTRA NUTRIENTS DON'T BURDEN THE ENVIRONMENT.

INTEGRATED FERTIGATION SYSTEM MONITORS PH AND EC VALUES AND DOSES FERTILIZER SOLUTIONS STRAIGHT TO THE RETURN WATER TANKS ACCORDING TO MEASUREMENTS.

NURSERY IS BASED ON USING 400X600 STYROFOAM TRAYS. IN THE NURSERY TABLE THERE IS A SMART ROLLER MECHANISM TO ENSURE LIGHT MOVEMENT OF THE TRAYS. THESE TABLES ARE LIGHT AND INEXPENSIVE. BECAUSE OF THE SIMPLICITY, THE TABLES ARE EASY TO LOCATE AT THE BEGINNING OF EACH GROWING LINE SO THAT THE PLANTS DON'T NEED TO BE MOVED FAR DISTANCES FOR TRANSPLANTING TO THE GROWING LINE. IRRIGATION BOOM MOVES ON TOP OF THE TABLES AND ITS SPEED AND IRRIGATION CYCLES ARE EASY TO CONTROL.



## GREEN AUTOMATION LTD

GREEN AUTOMATION LTD FOCUSES ON DEVELOPING AND MANUFACTURING GREENHOUSE AUTOMATION SYSTEMS. MAIN PRODUCTS ARE VEGETABLE PRODUCTION SYSTEMS INCLUDING GROWING LINES, PLANT SECTIONS, IRRIGATION SYSTEMS, IRRIGATION BOOMS, CONVEYORS, WASHERS AND AUTOMATIC PACKING LINES. COLLABORATION WITH THE LARGEST LETTUCES AND HERBS PRODUCER IN BALTIC SEA AREA, OVER 20 YEARS OF EXPERIENCE OF GROWING POT PLANTS AND MORE THAN 200 000 SQUARE METERS OF MANUFACTURED LETTUCE AUTOMATION SYSTEMS ENSURE EXCELLENT DEVELOPING ENVIRONMENT AND OUTSTANDING EXPERTISE ON GREENHOUSE AUTOMATION.

GREEN AUTOMATION SETS NEW STANDARDS IN TECHNOLOGICAL STATE OF GREENHOUSE AUTOMATION. PRODUCT DEVELOPMENT IS MADE BY USING THE BEST TOOLS AND THE LATEST TECHNOLOGIES IN THE MARKET. STUDIES MADE IN VISION SENSORS AND PLC – PROGRAMMING OPEN WHOLE NEW POSSIBILITIES IN HANDLING OF THE PLANTS AND END PRODUCTS OF AGRICULTURE PRODUCTION. CONTINUOUS DEVELOPMENT IS ALSO FOCUSED TO THE PLANT ITSELF AND DIFFERENT PLANT MIXES TO DEVELOP BETTER END PRODUCTS AND TO FIND NEW MARKETS.

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