



Water is life let's preserve it



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**I.I.S.S .BOJANO Giornate Erasmus + 19-25 Marzo
Sede di Bojano I.T.E.**



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I Mulini di Santa Maria del Molise



A S.Maria del Molise, anticamente denominata S. Maria e Giacomo, conosciuta come CAPO D'ACQUA sono presenti tre MULINI AD ACQUA costruiti alla meta del XIX secolo dal marchese Morra. Il paese è ricco di acqua grazie alle sorgentizie del **Rio** che insieme al **Callora** e insieme al **Quirino** è uno dei principali affluenti del Biferno nella Valle del Matese. I tre mulini servivano alla macinazione del grano e del granturco e hanno funzionato fino al 1965.

Oggi, dopo importanti lavori di restauro avvenuti a partire dal 1991, è possibile ammirare due mulini costruiti a poca distanza da uno dei laghetti formati dalle acque del torrente Rio. E' una zona molto bella in qualunque stagione, ma è particolarmente consigliato fare passeggiate e picnic durante la primavera e nelle calde giornate d'estate, quando il verde rigoglioso della vegetazione e lo scrosciare delle acque dei torrenti rendono particolarmente gradevole una sosta tra le sorgentizie di Santa Maria del Molise.

In Santa Maria del Molise, once named St. Mary and James, known as CAPO WATER, there are three WATERMILLS built in the second half of the XIX century by the Marquis Morra. The village is rich in water thanks to the sources of Rio which, together with Callora and Quirino, is one of the main tributaries of the Biferno river in the Matese valley. The mills were used to grind wheat and maize and worked until 1965.

Today, after the restoration work that has taken place since 1991, the visitor can see two mills built not far from one of the lakes formed by the waters of the Rio stream. It is a very nice area in every season, but it is especially recommended during the spring and the hot summer days, when the lush green vegetation and the sound of the waters of the rivers make particularly pleasant a stop between the sources of Santa Maria del Molise .



Seguendo la strada che sale verso Santa Maria del Molise, si incontra sulla destra l'ultimo dei tre mulini, chiamato "Mulin d' l' ran".

Un tempo veniva alimentato dall'acqua che, fuoriuscendo dal mulino più a monte (l'officina) attraverso un canale, riempiva un serbatoio sito posteriormente alle due macine che servivano una per la preparazione dei farinacei per gli animali, l'altra per grano e granoturco. L'acqua, entrando nel locale dalla condotta sopraelevata, precipitava al seminterrato, azionando una ruota idraulica orizzontale con asse verticale (turbina) che a sua volta azionava gli altri macchinari del mulino ("lubecchio" e "lanterna") che a loro volta azionavano le due macine di pietra, visibili all'esterno del mulino a pochi passi dal torrente.

L'acqua, lasciando la ruota o la turbina, veniva drenata attraverso un canale di coda che poteva fungere anche da canale di testa per un'altra turbina di un altro mulino. Attualmente solo una modesta quantità d'acqua viene immessa nel mulino e fatta uscire da un canale di coda; gran parte dell'acqua non viene fatta passare attraverso il mulino ma scroscia su un lato sinistro della condotta forzata creando innumerevoli cascatelle ripiene di muschio e alimentando il torrente di scarico del bacino di raccolta acqua che si trova una cinquantina di metri più a monte, alla base del secondo mulino (l'Officina).

SECONDO MULINO. Il secondo mulino, alimentato da una condotta forzata ancora esistente, fu trasformato nel 1908 a impianto per la produzione di energia elettrica ("Officina"). Adesso è possibile ammirare anzitutto l'acqua che attraverso la condotta scroscia veloce da Santa Maria fino all'"Officina".



Along the road that goes up towards Santa Maria del Molise, we meet on the right, the last of the three mills, called "Mulino d 'l' ran

Once it was supplied by the water which, escaping from the upstream mill (the workshop) through a channel, filled a tank situated at the back of the two millstones which were used, the first for the preparation of the farinaceous for the animals, the second for the wheat and the maize. The water, entering into the room from an upper canal, spilled to the basement, by actuating a hydraulic horizontal wheel with vertical axis which, in turn, actuated other machineries of the mill ("lubecchio" and "lantern") which, in turn, actuated the two millstones, visible outside the mill, a few steps from the creek.

The water, leaving the wheel, was drained through a tail channel which could also serve as a head channel for another turbine of another mill. Currently only a small amount of water is pumped into the mill and let it out through a tail channel; most of the water is not allowed to pass through the mill but pours on a left side of the penstock, creating countless waterfalls, filled with moss, feeding the discharge stream of the water catchment area which is located about fifty meters upstream, at the base of the second mill (the Workshop).

SECOND MILL. The second mill, supplied by a penstock which still exists, was transformed in 1908 as a plant for the production of electricity ("Workshop"). Now, it is possible to see the water that pours through the pipe from Santa Maria as far as the " Workshop. "





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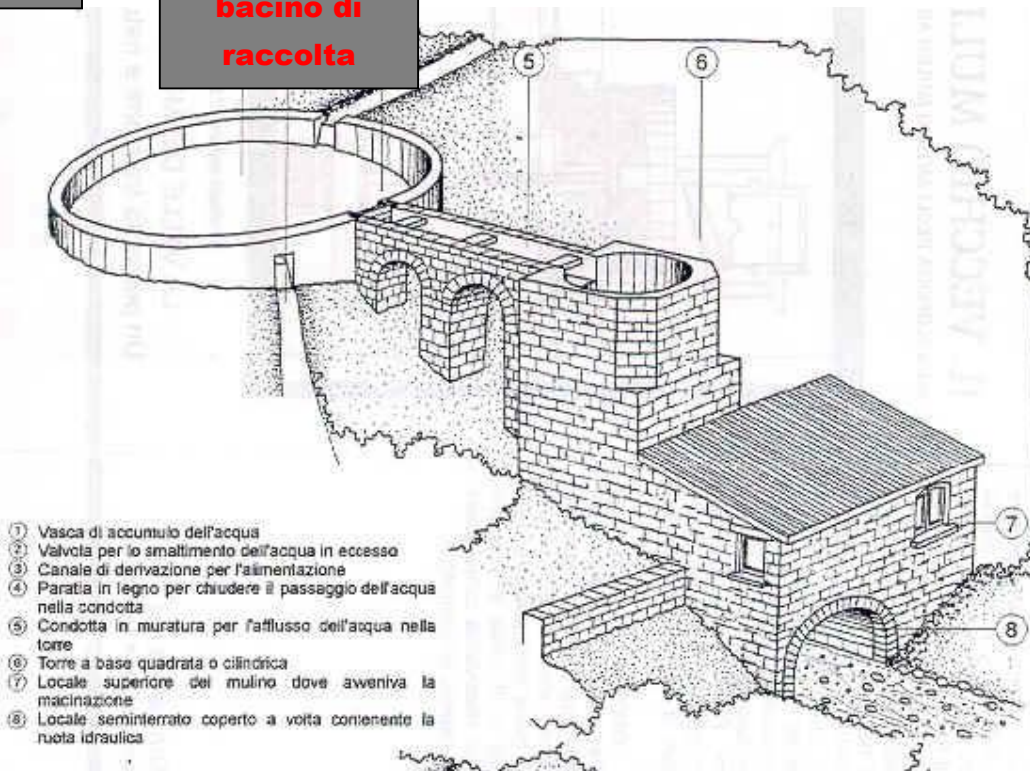
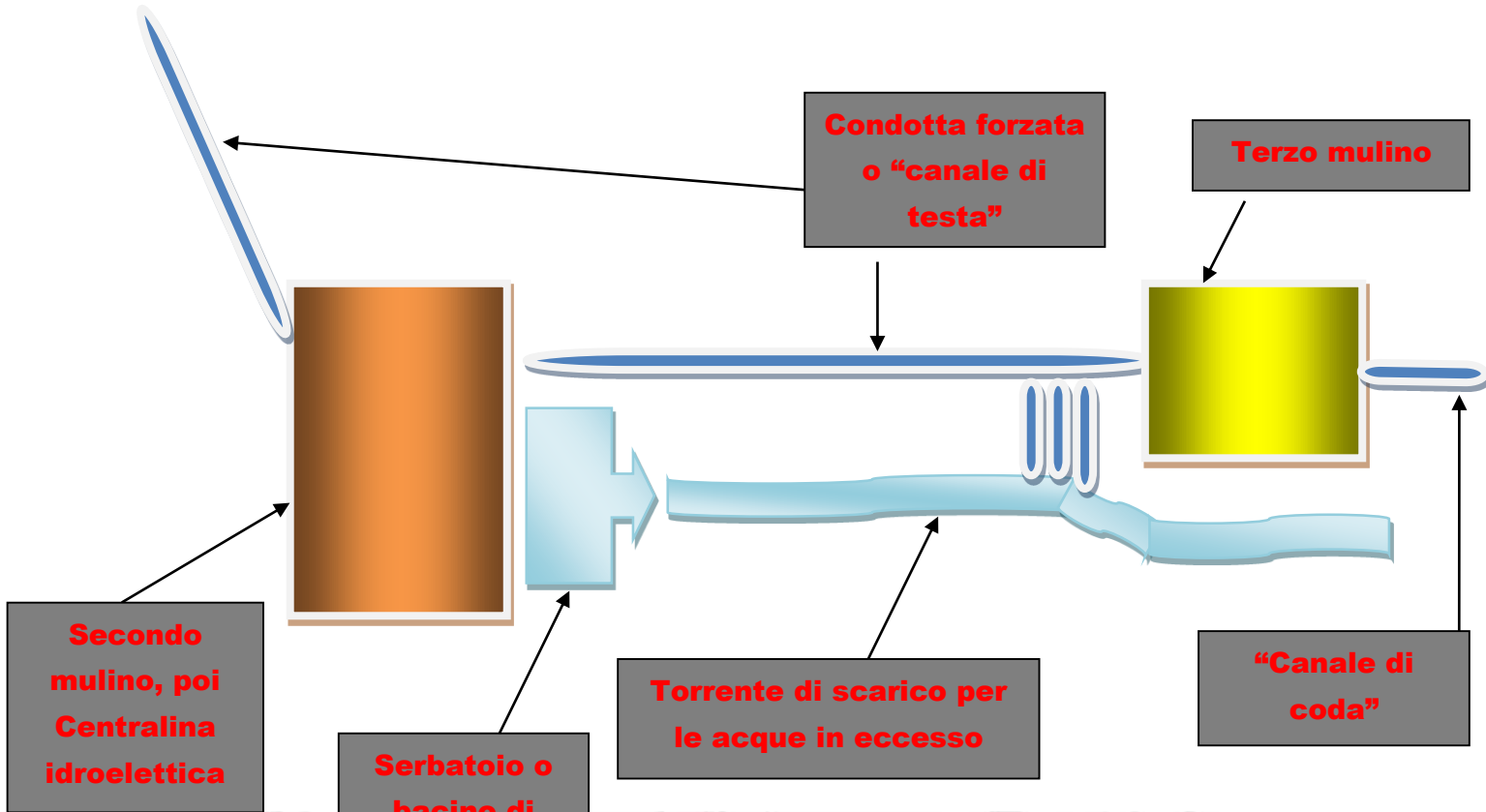
Entrando nella piccola centrale idroelettrica l'acqua azionava una pala idraulica che congiunta ad una dinamo e ad un alternatore forniva energia elettrica al vicino comune di Santa Maria.

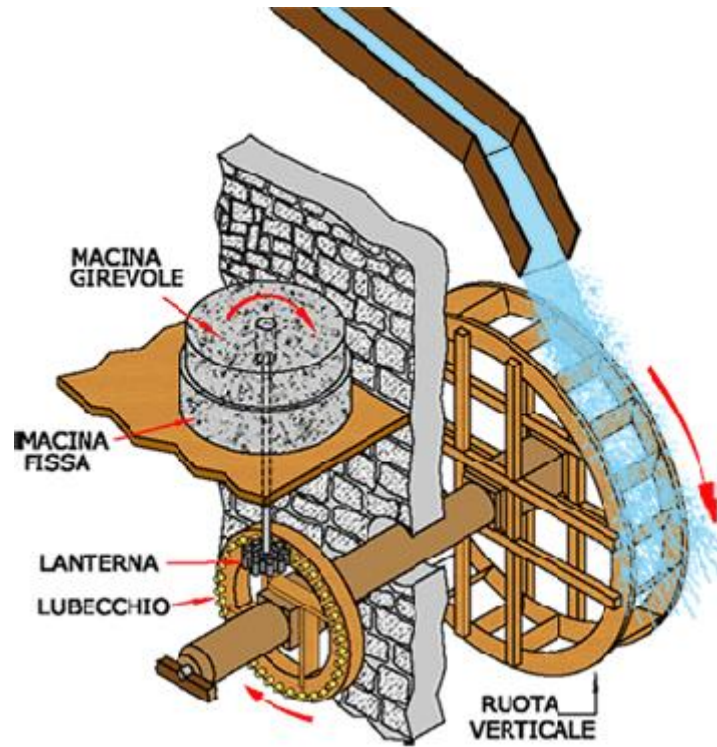
A valle dell'Officina (Secondo Mulino) parte una condotta forzata sopraelevata che in origine spingeva l'acqua velocemente verso il Terzo Mulino; adesso però, come detto prima, le acque in parte sono fatte scrosciare in un torrente alimentato dal bacino di scarico della centrale. Questo bacino, in cui si raccolgono acque limpide e cristalline non è stato costruito per la centrale (a monte) ma per il terzo mulino: nel caso infatti che con una prolungata siccità il livello delle acque della condotta si fosse abbassato troppo, impedendo il corretto funzionamento della ruota orizzontale, si sarebbero usate le acque del bacino per consentire un funzionamento minimo della ruota.

The water, entering into the small hydroelectric power, activated a hydraulic shovel that joint to a dynamo and to an alternator supplied electricity to the nearby town of Santa Maria.

Downstream the workshop (the Second Mill) an elevated penstock leaves; it originally pushed the water quickly towards the Third Mill; but now, the waters are partly made pour into a stream fed by the central drainage basin. This basin, in which crystal clear waters are collected, was not built for the plant (upstream) but for the third mill in case that a prolonged drought had reduced too much the level of the waters of the pipe, preventing the proper operation of the horizontal wheel, the water of the basin would be used to allow a minimum operation of the wheel.







A cura di Gianluca Bernini Carri e Daniela Mainelli

Alunni: Evangelista Giorgia e Laurenti Alessandro 5 A I.T.E I.I.S.S. Bojano

La ricerca è tratta dal libro di Michele Mainelli ' Sorella Acqua



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Rio Freddo Tunnel



The Biferno river can be considered the most important river in the Molise region . It is 85 Km long , it springs in Bojano from Pietrecadute, a place situated at the feet of the Matese mountains and flows through the Molisano territory , dividing it , into two parts. The river flows through a deep valley up to the coast and borders some medieval villages of great beauty.

Its mouth is situated close to the seaside resort of Termoli. In the past the river flow was greater: now a large part of the water is collected and is carried out through a tunnel to the opposite side of the mountain in the Campania region where it serves the aqueduct in the city of Naples situated on the Tyrrhenian sea opposite the Adriatic.

Molise Acque is an agency which is responsible for the management of the water services:

- The CAPTURE of water
- The regional and interregional SUPPLY
- The MAINTENANCE of the plants
- The water TREATMENT plants
- The water RISING PLANTS
- The CONTROL of drinkable water

The Special Agency Molise Water ensures the supply of drinkable water to the tanks of 170 municipalities of Molise, Puglia and Campania. The catchment area is of about 500,000 inhabitants and the water service is ensured through a system of about 2,000 km of pipelines, 250 tanks and 35 power lifting plants. The Aqueduct works are of high engineering value and are the destination of many visits by scholars from all over Europe. **Molise Acque** also supplies the land reclamation consortia of the Lower Molise to allow irrigation of about 14,000 hectares and the consortia for the most important industrial centers of the Molise region.

The system of aqueducts in Molise is the following:

- The Aqueduct Molisano destro conveys the water of the river Biferno and serves 41 Municipalities of Molise region ,21 of Campania region, 12 in Puglia. It was built in the 50s by the 'Cassa per il Mezzogiorno'.
- The Aqueduct Molisano sinistro, it conveys the water of the Trigno river, Pincio, Santa Maria del Molise and of Muro Lungo. It serves 45 municipalities.
- The Aqueduct Campate e Forme serves 12 municipalities.
- The Aqueduct Basso Molise serves the municipalities of the Adriatic Coast thanks to the Basin of Liscione

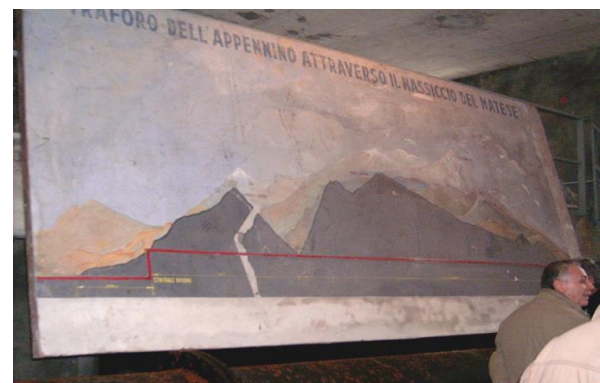
In the RIOFREDDO TUNNEL we find the springs of the river Biferno.

Boiano is well known for its many springs They are: Riofreddo, Pietrecadute and Maiella well known as Santa Maria dei Rivoli.

These three springs are able to capture about 3 metres cubes of water per second that is to say in one year about 100 thousand metres cubes of water and together with the water of the snow dissolution and of the rain falls, the flow rate rises in the spring season.

In Santa Maria dei Rivoli, the Calderari river springs ,it crosses Bojano and it is the first tributary of the Biferno river.

In Maiella the water is conveyed in some pools where salmons ,eels and trout are reared.





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The waters of the springs of Maiella and Pietrecadute are carried out through a canal of 200 metres long towards Riofreddo and here together with the water of the spring of Riofreddo are conveyed ,thanks to the plant of distribution ,into three main aqueducts : Aqueduct Molisano Destro, Aqueduct Molisano Sinistro and Aqueduct Campano

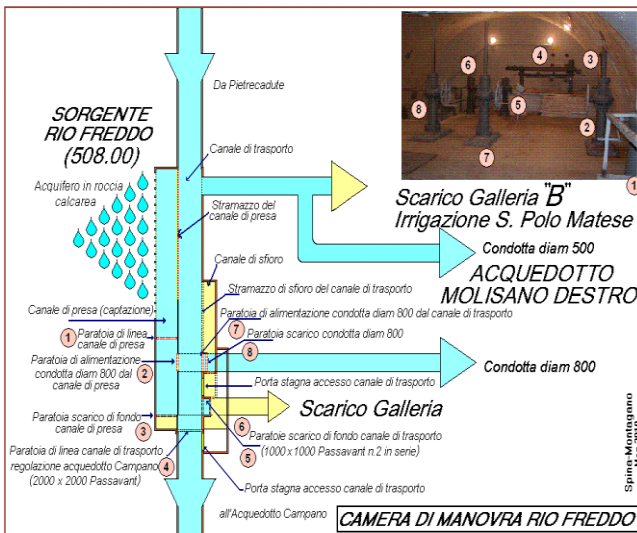
The aqueduct Molisano Destro receives the water that flows from 505 meters high to 494 meters ,here the water is conveyed in some pools to be risen up, thanks to a rising plant, and led towards the tank of Vinchiatturo in order to be distributed in a network of canals.



Region for this reason because the price they would pay for the water is too low. The tunnel is long 18 km ,the first 2250 meters are served by five service windows. From Riofreddo other two aqueducts leave, the Molisano right aqueduct which serves many towns in Molise ,and the Boiano aqueduct which serves the area of Boiano and the near villages.

The water that is conveyed, is not treated, it is filtered by the calcareous massif of the Matese mountain. It can be considered a mineral water , pure and not contaminated thanks to the absence of big industries which could dump polluted substances in the environment.

Molise is also a region of thermal waters. The most famous is the Sepinia: a water of low mineral content. It comes from the Springs of Tre Fontane. It is used for the therapy of some illness. Castellina water is another mineral water which comes from the Springs of Castelpizzuto and Molisia water bottled at source in the plant of Di Iorio Spa in Frosolone.



<http://www.moliseacque.com/>

The aqueduct Campano instead brings water to the Campania Region for its water supply. The aqueduct bores (perforates) the Matese, passing through Mount Mutria to arrive at Cusano Mutri in Campania. It carries 3,13 meters cubes of water per second. There is also a quarrel between Campania Region and Molise



PREMIO AGORÀ per il packaging

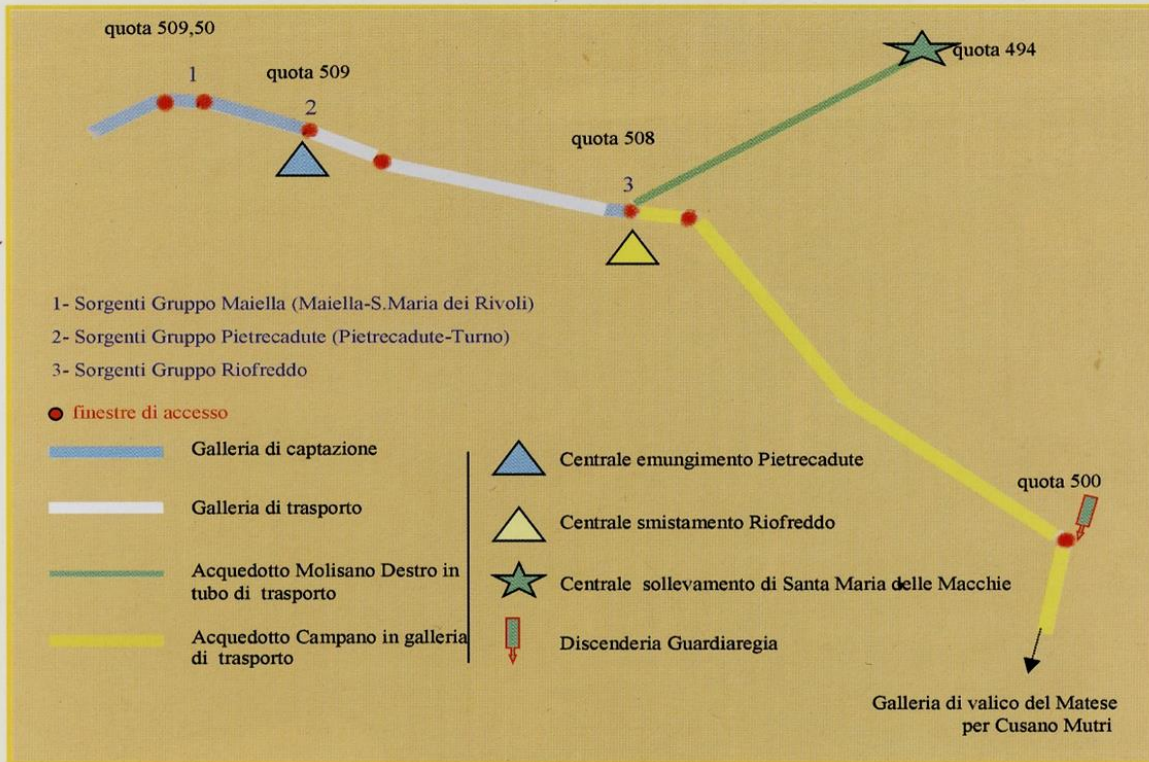




Acquedotti

- Molisano Destro

- Campano



Galleria di captazione (Maiella- Pietrecadute + Riofreddo)..... m 2.250

Galleria di trasporto (Fosso Abate - Riofreddo- Guardiaregia)... m 5.616

Galleria di captazione + Galleria di trasporto m 7.866

Acqua di captazionemax 3,93 m³ / s

Acqua in tubo di trasporto Acquedotto Molisano Destromax 0,80 m³ / s

Acqua in galleria di trasporto Acquedotto Campanomax 3,13 m³ / s



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This beautiful photo shows the water which comes from the rudist limestone of Monte Lacosta. The limestone is red for the presence of sulfurous water.

A Cura di Daniela Mainelli

La ricerca è tratta da "SORELLA ACQUA" di Michele Mainelli

<http://www.moliseacqua.com/>

Alunni : Taddeo Tonya, Iacovantuono Libera I.I.S.S. Bojano 5 A I.T.E



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Welcome to Di Iorio SPA factory

HISTORY

Di Iorio company has more than one hundred years of history. Its plant is located among the mountains of the Molise region, whose mineral water is used for the beverages it produces.

In 1896 Filippo Di Iorio, the founder, started producing drinks, particularly the "gassosa", an Italian-type of lemonade.

Later, Francesco and Luigi, his sons, kept producing beverages according to the same traditional recipes using modern technology.

The company today is recognized as one of the oldest in the mineral water and sparkling drinks production sector.

The company produces 2 lines of products under 2 registered trademarks:

- Molisia
- Stappi

MOLISIA mineral water is bottled at source where it flows in a pristine natural setting. It is famous for its unique features and physical properties.

STAPPI trade mark represents a wide range of soft drinks, aperitifs and lemonade in different flavors. All the beverages are produced with only natural flavors to ensure their quality.

WHAT IS HORECA

Di Iorio SPA products are sold for retail use but also for HORECA distribution.

HORECA means HOtel, REstaurant, Catering. It's a distribution channel where drinks are sold in specific formats suitable for the use in restaurants and hotels.

The balance of mineral salts and the absence of nitrite make it the ideal water for healthy, natural wellness. It won the Agorà prize for the packaging. A pretty bottle with reflexes and colors as signs of purity,

The anatomical shape and the originality of the mark makes it a winner for the packaging .

Commercially marketed since 2006, MOLISIA is bottled in an advanced technology plant with minimal environmental impact. Among the most modern in the industry, the plant reaches a daily production capacity of 1,500,000 bottles. The high quality of the MOLISIA bottling process, guaranteed by the ISO 9001 certification - provides constant monitoring of each phase and the complete traceability of each batch of product

PLANT

The quality of the Di Iorio products is ensured by an advanced technology plant and a modern laboratory analysis where all the ingredients and end-products are controlled. The research of raw materials the use of natural flavors and the continuity of traditional recipes combined with a technological innovation have made this company very strong in a changing, modern market

A complete line of products allow the company to meet the needs of the modern market. The bottling line produces up to 500.000 bottles per shift and easily meets the needs of the traditional market, mass distribution, organized distribution but also a part of the foreign market (Europe, USA, Canada and Australia).

This plant has also a minimal environmental impact, in fact the roof is covered by 800 solar panels that produces electricity used in the production.

The plant is divided in two bottling lines that now we are going to visit: the glass line and the PET (plastic bottles) line.



<http://www.diioriospa.it/>

A Cura di: Emanuele Di IORIO 3 A I.T.E. I.I.S.S. Bojano