

WISWAM

WALMI Information Service on Water management

Volume 19

Issue No. 04

Oct-Dec. 2009

Contents

Select Article	02
Recent Periodical Literature	08
New Arrivals	16
Calendar of Events	17
Addresses of other WALMI's	18

Select article

MODERNISATION OF CANAL COMMAND AREAS THROUGH ADOPTION OF PIPED NETWORKS AND/OR MICRO IRRIGATION SYSTEMS.

S.P. JADHAV

1 INTRODUCTION

Irrigation is a vital input for increasing productivity of crops. It is observed that irrigation played important role in bringing the “Green Revolution” which took place in the country after independence. During last ten “Five years Plans”. Government of India has given attention towards irrigation and spent considerable amount of time, money and energy in development of water storage structures such as major, medium and minor irrigation projects. After realizing the advantages of the irrigation projects in different ways such as increase in agricultural productivity and overall economic growth/benefits, fighting with drought and flood situations, overall social development etc. The Government of India is now planning to implement the ambitious “ River Linking Project” in the country.

Even though the government has created sufficient water storage in the country, the water distribution at the end user side has remained neglected. The water Distribution at the user end is important because without that the very purpose of creation of the reservoirs is defeated. However since last decade there seems to be a change in the approach by the government. Now more and more emphasis is on water distribution side rather than creation of the storage structures, which is a need of the day.

2 EXPLANATION OF THE PROBLEM

Since independence, Government of India has spent considerable amount of funds, time and energy on development of command area and still has not been successful to utilize 100% of the potential created. There is always a gap between potential created and potential utilized. This could be due to following reasons:

- Inefficient management of water distribution systems in the command area.
- Unreliable water supply hence farmers are not interested
- Noninvolvement of farmers in management of water distribution systems in command area below outlet.
Non-availability of funds in time
- Construction of canals which is a time consuming job
- Canal networks require land acquisitions which again is a difficult task to finish.

Lower utilization of irrigation potential results in lesser area cover than the targeted within the same quantum of available water. This has ultimately resulted in poor recoveries of water charges and also lower water use efficiencies. For efficient performance of irrigation system, it is necessary that the system should be self-sustainable. In order to make them self-sustainable, improvement in the efficiencies of water distribution systems is essential.

Improvement in efficiencies of water distribution systems is possible only by the modernization of canal command areas through adoption of piping networks/MIS. Following gives the comparison of canal systems and piped distribution network systems:

3. DRAWBACKS OF CANAL SYSTEMS

- More water losses (evaporation, seepage etc)
- Less Conveyance efficiency
- Requires Land Acquisition
- Hydraulic Gradient to be maintained by giving uniform slope to the fields
- Requires construction activity. Hence time consuming
- Longer Gestation Period
- Prone to silting. Requires more maintenance
- Shorter life of the system.

4. ADVANTAGES OF PIPED NETWORK SYSTEMS

- Less water losses
- Higher Conveyance efficiency
- Do not require land acquisition
- Do not require land leveling/slope
- Work can be completed at much faster rate
- Shorter gestation period
- Once self-cleansing velocity is maintained less maintenance is required
- Durable and long-lasting once buried beneath soil

5. CRITERIA FOR ADOPTION OF PIPED NETWORK/MIS IN CANAL COMMAND AREAS

- A Single Model or Technology may not suit for all the areas
- Model or Technology or Solution needs to be location specific
- Adoptability to topography, cropping patterns, land extents
- Training to be key input for bringing in a change.

6. CONTRIBUTION OF JISL IN DEVELOPMENT OF IRRIGATED AGRICULTURE

In India, Jain Irrigation has been executing many projects in Modern Irrigation Systems including drip and sprinkler irrigation systems. In India we have

So far covered more than 0.7 million ha for various crops and our presence is there in all the states. Since last two years we have also started modernizing canal command Development projects by providing pipe network systems with/without Sprinkler or Drip irrigation systems, Details of the turnkey projects executed or in progress in the canal command areas are given below:

_____ (i) Narmada Canal Project, Sanchor Rajasthan: This is a sprinkler irrigation project having HDPE pipes as mains and lateral lines. There is a common sprinkler irrigation system for a fanners' group of 8-8.5 ha area. Diggi is provided along the canal. Each diggi serves approximately 50 to 200 ha area. Diggi is provided adjacent to canal minor for getting water directly from canal through pipes. Monoblock pumpsets is of 10-30 HP are provided on the diggi. The capacity of the diggi is 4 hrs storage.

As there is no local storage, the model is suitable for locations where: (i) Water is available up to diggi (ii) Farmers are ready to utilize common sprinkler irrigation system (iii) Farmers should be willing to run the sprinkler systems even in the night.

(ii) Indira Gandhi Nahar Pariyojana, Bikaner, Rajashtan: This is a sprinkler irrigation project having HDPE pipes as mains and lateral lines. There is a common sprinkler irrigation system for a farmers' group of 8-12 ha area. Diggi is provided along the canal. Each chak having one two diggies serves approximately 100 to 250 ha area. Diggi is provided adjacent to canal minor for getting water directly from canal through pipes. In case of two diggies, one diggi is provided adjacent to canal and the other one is away from the canal. Monoblock pumpsets is of 10-30 HP are provided on the diggi. The capacity of the diggi is 84 hrs storage.

As there is no local storage, the model is suitable for locations where :

- 1) Water is available up to diggi (ii) Farmers are ready to utilize common sprinkler irrigation system.
- (iii) Krishna Bhagya Jal Nigam Ltd, Almatti, Karnataka: (Model 1) Water source is a bore well. Average 8 ha area will be irrigated from each bore well. HDPE/PVC pipe network from bore well to the field with outlet hydrants. All Hydrants will gel water al 20-30 m pressure with discharge proportionate to area. Shiftable Sprinkler system from outlet hydrant is proposed. Project is on turnkey basis with arrangement of electricity provision as well as all civil and mechanical requirements with 2 year.

Components of the project includes bore well, pump house with pumping unit, provision of electricity (Transmission lines + Transformer), distribution Network up to outlets and shiftable Sprinkler system from the outlets.

Advantages of the Project includes provision of irrigation facility to the command area adjacent to the canal where irrigation by canal is practically and technically not possible. Seasonal irrigation facility to more people by adoption of sprinkler system instead of conventional method and non-irrigated area of the command area also can be brought under irrigation by providing this type of model.

The project will have following limitations: This type of model requires at least seasonal assured water from the bore wells. Electricity network should be available nearby to the project location and operation of the sprinkler system should be followed as per the decided schedule within the group.

The model is suitable for locations where : (i) There is no local storage and non availability of any existing surface water source. (ii) Ground water table level is good and electrical network availability is nearby area.

Model (2) Water source is Malprabha river overall 112 ha area will be irrigated directly from the river by 6 pumping units. PVC pipe network from river to the field with outlet hydrants. All pumping stations situated at river itself within pump house cum store room. All Hydrants will get water at 20-30m pressure with discharge proportionate to area. Shiftable sprinkler system is proposed from the hydrant. Project is on turnkey basis with arrangement of electricity provision as well as all civil and mechanical requirements with 2 year maintenance.

The components of the project includes sump, pump house with pumping machinery, provision of electricity rising mains, distribution network up to outlets and shiftable sprinkler systems from outlets.

Advantages of the project includes provision of irrigation facility to the command area adjacent to the canal where irrigation by canal is practically and technically not possible , Seasonal irrigation facility to more peoples by adoption of sprinkler system instead of conventional method and unirrigated area of the command area can be brought under irrigation by providing this type of model.

Limitations are: This type of model requires at least seasonal assured water source Electricity network should be available nearby to the project location from where electricity can be made available and operation of the sprinkler system should be followed as per the decided schedule within the group.

The model is suitable for locations where (i) There is a water source (reservoir), however Canal network is not ready, (ii) Minor irrigation projects or Groups of Command areas up to 500 ha.

- (iv) AMRP Project, Nalgonda, AP : Water source is canal. Diggi has been provided adjacent to canal. The capacity of the diggi is one day storage. Each diggi serves 10-12 ac area. Pump of capacity 5-7.5 HP is installed on each diggi. Semi permanent sprinkler irrigation system from outlet hydrant. The project is on turnkey basis with arrangement of civil and mechanical parts. The entire job with maintenance period of 3 years.
- (v) PendLuru Micro Irrigation Project, AP: Water source is a canal. Diggi has been provided adjacent to canal. The capacity of diggi is one day storage. Each diggi serves 100 ac area. Pump capacity of 50-75 HP is installed in each diggi (5-7.5 HP – 10 no on each diggi) Semi permanent sprinkler irrigation system from outlet hydrant. The project is on turnkey basis with arrangement

of civil and mechanical parts. The entire job with maintenance period of 3 years.

- (vi) Sardar Sarover Narmada Nigam Ltd. Baroda, Gujarat: Water source will be a canal. Intake well or diggi has been proposed adjacent to canal or 30 m away from the canal. Each intake well or diggi will serve the area of 50 – 60 ha. Pump capacity of 30 HP is proposed on each intake well / diggi. Drip irrigation system is proposed in future. The project is on turn key basis with arrangement of civil and mechanical parts. The entire job with maintenance period of 1 year or one season.

- (vii) Puma Medium Irrigation Project, Achalpur Maharashtra:

- (a) Features

Water source is canal outlets from the minor.

Total 2100 ha area is brought under execution with pipe conveyance system instead of field channels from minor outlets.

PVC pipe network from canal outlet from minor to the fields instead of field channels.

- Project is on turnkey basis with provision of sill trap chambers.

- (b) Components

- Sill trap chambers.
- Pipe network from the outlets.

- (c) Advantages

- When ground level is below water level, field channel can irrigate adjacent area but not tail end area but pipe Network can irrigate entire area uniformly.
- When ground level is above water level, nothing can be irrigated by field channel but low laying area can be irrigated by pipeline network.
- Marginal water losses.
- Water Use Efficiency is high.
- No question of water logging.
- No problem of salinity.
- Less maintenance. Can be managed properly.

- If each and every farmer and/or each gut will be provided with individual turn out social problem will be minimum.

(d)Limitations:

Initial Cost is comparatively more but considering maintenance part with traditional field channels it is very less in long term expenses.

(e)Applicability

The model suitable for locations where:

- From canal outlets of minor where sufficient gravity head will be available.
- This model is suitable for all type of pipe conveyance system from W.S. to the fields.

7. CONCLUSION:

Irrigation is a vital input for agriculture. It is a proven fact that productivity increases due to irrigation. In order to further increase the productivity increases due to irrigation. In order to further increase the productivity per unit volume of water, use of piped network systems (Conveyance) and micro irrigation systems (End use distribution) becomes necessary. There are various models already available for modernization of canal systems through use of micro irrigation systems and piped network systems. Every model is tailor made and no single model suits for all the conditions. Choice of the model will depend up on topography, soil type, cropping pattern, land extent etc. And it has to be a location Specific.

Recent Periodical Literature

Agriculture

004519

Author : Gomarkar, Shriram;Jagtap, Prakash
Title : Khedyakade parat chala (Riverse migration)-Marathi
Source : Vanarai -Visheshank 2009
Year : 2009 Pages : 89-92
Keywords : Gavdevadi success story,Case study,

004488

Author : Ingole, P.G.
Title : Usache sinchan vyavsthapan (Marathi)
Source : Maharashtra sinchan vikas
Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 15-17
Keywords : Irrigation Management,Sugarcane,Irrigation systems,

004491

Author : Jade, B D..
Title : Purva hangami Kapus lagvad thibak sinchan padhativar vikrami utpadanache tantra (Marathi)
Source : Maharashtra sinchan vikas
Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 24-27
Keywords : Cotton Cultivation,Drip irrigation,

004496

Author : Raskar, sandip;Kalyankar , Gajanan
Title : Mrud sandharanat gavatache mahatva (Marathi)
Source : Maharashtra sinchan vikas
Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 18-19
Keywords : Soil conservation, Grass cultivation,

004497

Author : Deshmukh baradkar, Dilip
Title : Swayamshasit pramanikaran paddhati (Marathi)
Source : Maharashtra sinchan vikas
Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 20-22
Keywords : Participatory Guarantee scheme,Standardisation,Working system,

004498

Author : Satpute, G.U. and others
Title : Vidarbhatil koradvahu shetisathi shet talyachi garaj (Marathi)
Source : Maharashtra sinchan vikas
Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 23-26
Keywords : Dry farming,Farm lake,Rain water conservation ,

004499

Author : Shinde, Kalidas Ananda

Title : Mati parikshan kalachi garaj (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 29-30

Keywords : Soil testing,

004507

Author : Dudley, Shelty C

Title : From growing crops to growing cities: SRP's transition from ag to urban.

Source : Irrigation and Drainage Systems

Vol/Iss/Mth : 23 (2,3), Aug Year : 2009 Pages : 63-77

Keywords : Irrigation,Farming,Urbanisation,Salt River Project(SRP),

Abstract : This paper will visually show, through the use of historic and contemporary photographs, that the National Reclamation act is a cornerstone of growth in the West. The irrigation works constructed under the federal reclamation programme provided a stable water supply for crops, transforming the desert to the farmlands, and continued with the development of cities, businesses and communities. Hydropower, a by-product of water development, initially operated irrigation pumps and lighted homes, and now powers industries. The salt river project (SRP) as a one of the first multipurpose reclamation projects authorized by the federal government, provided irrigation water to the settlers of the salt river valley at the beginning of the twentieth century. Over hundred years later, SRP continues that tradition and is still delivering water to its share holders and customers, but now in an urban setting.

004510

Author : Neese, Donovan and others

Title : Boots on the ground : construction management of urbanizing irrigated farm land

Source : Irrigation and drainage systems

Vol/Iss/Mth : 23(2-3),Aug Year : 2009 Pages : 131-139

Keywords : Irrigation canals,Construction management,Water conservation,Urbanising farm land,

Abstract : Everyone benefits when irrigation districts have a construction manager's boots on the ground. The irrigation districts win as they have an additional shield against the potential risks of urbanization .Contractors' benefit from quick resolution to real time problems. Developers know that an irrigation districts will accept the work since a professional construction manager coordinated and inspected the installation. The level of trust developed over the years between the construction managers and the irrigation districts also increases the benefits of construction management service.

004514

Author : Deshmukh, R.B.

Title : Navin van v pik vyavasthapan paddhati avashyak (Marathi)

Source : Vanarai- visheshank 2009

Year : 2009 Pages : 49-53

Keywords : Crop management,Global warming,Horticulture,

004520

Author : Shah, V.A.

Title : Sendriya shetital shashvat satya (Marathi)

Source : Baliraja

Vol/Iss/Mth : 41(1),Jan Year : 2010 Pages : 50-53

Keywords : Organic farming,Sustainable development,

004521

Author : Jambhekar, Hemangi

Title : Sendriya sheti sambhandhi lekh mala -4 Kimaya rasayanachi-Mrutyu kade nenari ! (marathi)

Source : Baliraja

Vol/Iss/Mth : 41(1),Jan Year : 2010 Pages : 99-102

Keywords : Organic Farming,Chemical pesticides,

004522

Title : Karar sheti (Marathi)

Source : Baliraja

Vol/Iss/Mth : 41(1),Jan Year : 2010 Pages : 121-133

Keywords : contract farming,

Engineering

004503

Author : Mohile, A.D.

Title : Managing water related extremes- strategic adjustments

Source : water and Energy International

Vol/Iss/Mth : 66(3),Jul-Sept Year : 2009 Pages : 15-24

Keywords : Water Balance,Water allocation,water rights,Interbasin transfer,Drought management,Disaster management,

Abstract : The main purpose of this paper is to present a unorthodox view point about how the Indian water resources engineers need to deal with water related extremes. The purpose of the paper, decidedly, to provoke thinking and not to prescribe solutions .Some recommendations are given but these also for initiating discussion.

Environment Ecology

004506

Author : Trajkovic, Slavisa;Kolakovic, Srdjan

Title : Estimating reference evapotranspiration using limited weather data

Source : Journal of Irrigation and drainage Engineering

Vol/Iss/Mth : 135(4),Jul-Aug,

Year : 2009 Pages : 443-449

Keywords : Evapotranspiration,Air temprature,Radiation,Humidity,Wind speed,Weather data,Estimation,

Abstract : This paper examines the potential of FAO -56 PM equation in estimating the ETo under humid conditions from limited weather data, For this study,full weather data sets were collected from six humid weather stations from Servia,South East Europe.FAO 56 reduced set PM ETo estimates were in closest agreements with FAO 56 full set PM

ETo estimates at the most of locations. The difference between FAO 56 Full set PM ETo estimates and FAO 56 PM reduced set ETo estimates generally increases by increasing the number of estimated weather parameters. Over all results indicate that FAO 56 reduced set PM approaches mostly provided better results compared to Turc equation, adjusted Hargreaves equations and temperature based RBF network.

004512

Author : Chitale, Madhav

Title : Badalya havamanamule panya babatchya navya upaya yojana avashyak (Marathi)

Source : Vanarai

Vol/Iss/Mth : Vanarai visheshank 2009

Year : 2009 Pages : 29-33

Keywords : Evapotranspiration, Water remedies,

004517

Author : Swami Nathan, M.S.

Title : Havaman badalacha yugatil mansun vyavasthapan (Marathi)

Source : Vanarai -Visheshank 2009

Year : 2009 Pages : 25-28

Keywords : mansun management, Environment change, Green revolution, Food security, Water security,

004518

Author : Pachaouri, Rajendra K.

Title : Jagatik tapman vadh he atal satya aahe (Marathi)

Source : Vanarai-Visheshank 2009

Year : 2009 Pages : 21-23

Keywords : Global warming,

Geology Earth sciences

004516

Title : Sarvasamaveshak upayayojana avashyak (marathi)

Source : Vanarai-Visheshank 2009

Year : 2009 Pages : 15-19

Keywords : Natural resources, Forest management, Watershed development, Water management,

004515

Author : Khole, Medha

Title : Naisargik sanranchanache jatan karane avashyak (Marathi)

Source : Vanarai-visheshank 2009

Year : 2009 Pages : 75-78

Keywords : Environment, Global warming, Ozone, Sustainable development,

Hydraulic Engineering

004495

Author : Hangekar, Chandramohan

Title : Three gorges-abhiyantriki kaushalyache avhan (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 14-15

Keywords : Three Gorges, Yangtse river,

004504

Author : Jadhav, S.P.

Title : Modernisation of canal command areas through adoption of piped networks and/or microirrigation systems

Source : Water and Energy International

Vol/Iss/Mth : 66(3),Jul-Sept Year : 2009 Pages : 33-36

Keywords : Canal command area, Pipenetworks, Microirrigation system,

Irrigation

004485

Author : Kadale, Asok; Payal, Sandeep

Title : Marathwada vibhagatil panlotk shetrasathi margadarshak tatve (marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 3-8

Keywords: Watershed Development, Soil conservation, Intercropping, Guidelines, Mulching, water storage,

004486

Author : Paranjape, Ulhas

Title : Jalsanvardhanatun phalbagh lagvad (marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 9-10

Keywords : Horticulture, Water storage, Water conservation,

004487

Author : Bhalerao, V.P.

Title : Mahiti tantradnyanachya vaparane adhunik sinchan vyavasthapan (marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 11-14

Keywords : Computer application to IWM, Information technology, Irrigation devices,

004489

Author : More, D.M.

Title : Pani vyavasthapan sudhara (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 18-20

Keywords : Irrigation management,

004490

Author : Dingre, S.K.;Pawar, Dilip

Title : Thibak sanchachya karaksham vaparasathi amlikaran v clorinikaran kriya (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 21-23

Keywords : Drip irrigation set,Clorination,Acidatation,

004492

Author : Pawar, Dilip;Dingre, S.K.

Title : Sukshm sinchan paddhati khali tomato pikachi lagvad phadeshir (marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(1),Oct-Dec Year : 2009 Pages : 28-30

Keywords : Micro Irrigation system, Tomato cultivation, Drip irrigation,

004493

Author : Save, R.K.

Title : Jalvyavasthan adhik gambhiryane ghyayala have (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 3-4

Keywords : Irrigation management,

004494

Author : More, D.M.

Title : Phalotpadanasathi jalvyavasthapan (marathi)11th Maharashtra sinchan parishad

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 5-9

Keywords : Horticulture,Irrigation management,

004500

Author : Dudul, Avinash

Title : Maharashtra sinchan paddhatiche shetkaryan kadun vyavasthapan adhiniyam 2005 (marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 31-33

Keywords : Irrigation systems,MMISF,

004501

Author : Kulkarni, M.G.;Deo, S.R.

Title : Maharashtra jalkshetra jalsudhar prakalp- loksahbhag,prachar,v prasar (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 34-35

Keywords : MWSIP, Peoples participation, Farmers meeting,

004502

Author : Jade, B.D.

Title : Thibakvaril purva hangam kapus pikanche arthshastra (Marathi)

Source : Maharashtra sinchan vikas

Vol/Iss/Mth : 23(2),Jan-Mar Year : 2010 Pages : 36

Keywords : Cotton crop ,Drip Irrigation,

004505

Author : Sadiq, S.A.

Title : Modernising irrigation management of Hemavathy project using MASSCOTE approach

Source : Water and Energy International

Vol/Iss/Mth : 66(3),Jul-Sept Year : 2009 Pages : 37-41

Keywords : Hemavathy Project,Modernisation of irrigation,

Abstract : Hemavathy Reservoir project created by constructing a dam across river Hemavathy in Hassan District of karnataka to store 1050.60 Mcum of water and to irrigate 700751 acres during khariff and Rabi seasons. To have a management solution for managing the available water resource in an equitable manner, the system was studied by using MASSCOTE approach.

004508

Author : Phillips, Daniel H. and others

Title : Water resources planning and management at the salt river project, Arizona, USA.

Source : Irrigation and Drainage Systems

Vol/Iss/Mth : 23(2,3), Aug Year : 2009 Pages : 109-124

Keywords: Conjunctive Management,Water Supply,Drought Planning,Urbanisation,SRP,

Abstract : The salt river project (SRP)was created in the early 1900s to assure an adequate water supply for its shareholders in the salt river valley, Arizona, USA. The straight forward job of storing inflows and meeting demand from a single reservoir system soon became more complex. As the population of the salt river valley swelled, additional reservoirs were added to the system, alternative supplies of water were developed, and hydropower generation became a financial consideration in reservoir operations. Nevertheless, the primary operational objective continues to be the conjunctive management of multiple sources of water to ensure an adequate carry-over supply of water for SRP's shareholders in the salt river valley.

004509

Author : Smith, Stephen W.

Title : Secondary water systems for landscape irrigation: issues and opportunities

Source : Irrigation and drainage systems

Vol/Iss/Mth : 23(2,3), Aug Year : 2009 Pages : 125-129

Keywords : Dual Water Systems,Landscape Irrigation,Case Study,

Abstract : Successful regional secondary supply or dual system project can be found in several western states. Provision of raw pressurised water for landscape irrigation is a sound concept and can maintain continued use of the decreed water supply without administrative or water court changes. Pitfalls or fatal flaws associated with intended regional systems are often more related to sociological and political issues rather than Engineering problems.

004511

Author : Egea, G and others

Title : Usefulness of establishing trunk diameter based reference lines for irrigation scheduling in almond trees

Source : Irrigation Science

Vol/Iss/Mth : 27(6), Sept Year : 2009 Pages : 431-442

Keywords : Irrigation scheduling, Statistical analysis,

Abstract : This study highlights the suitability of Maximum daily trunk shrinkage (MDS) for establishing reference base lines for scheduling irrigation in almond trees due to its linear response to evaporative demands. Among vapor pressure deficient (VPD) related variables, VPD_{mx} was the best predictor of MDS in the case of Almond trees. It was demonstrated that the slight hysteretic behavior of the MDS versus VPD_{mx} relationship does not significantly affect its predictive power, and that one base line, independent of phenological stage, could be suitable for almond tree irrigation scheduling.

Sociology

004513

Author : Mehta, Vijay

Title : Gramin arthvyavasthet motha pharak (Marathi)

Source : Vanarai-visheshank 2009

Year : 2009 Pages : 45-48

Keywords : Rural development, Indian farming,

-

New Arrivals

Author	Title	Shelf mark
Sharma Premjit (ed)	Contract Farming	338.13/SHA
Varshneya M C ; ICAR	Textbook of Agricultural Meteorology	551.5/VAR/ICAR
Kumar Arvind (ed)	Environmental Science Appreciation and Reception	574.5/kUM
Acharya Deepak	Indigenous Herbal Medicines	581.534/ACH
Saravannan R (ed)	Agricultural Extension Worldwide Innovations	630.7/SAR
Peverill K I ; Sparrow L A (ed)	Soil Analysis, An Interpretation Manual	631.4/PEV/SPA
Pawar R K	Organic Farming For Sustainable Horticulture	631.584/PAW
Guha Sudeep	Handbook of Organic Composting	631.875/GUH
Gangawane L V ; Khilare V C (ed)	Co lour Handbook Crop Diseases Identification Management	632.3/GAN/KHI
Gaur A C ; ICAR	Bio fertilizers In Sustainable Agriculture	632.9/GAR/ICAR
Prasad R ; ICAR	Textbook of Field Crops Production	633/PRA/ICAR
Gopalchari N C ; ICAR	Tobacco	633.71/GOP/ICAR
Ghosh S P ; ICAR	Citrus fruits	634.3/GHO/ICAR
Pal B P ; ICAR	Rose In India	635.9/PAL/ICAR

Calendar of Events

Date & Venue	Theme	Organization	Contacts
March 22-27, 2010 ETDC,IRMA, Anand, Gujarat, India.	Training Programme Sustainable Groundwater Management in Semi- Arid & Arid Regions of India	Jointly organized by SOFILWAM Society for Integrated Land and Water Management And IRAP Institute for Resource Analysis and Policy	Dr.M.Dinesh Kumar, Programme Director, IRAP 202, Riviera A Apartments, Dwarkapuri Colony, Panjagutta, Hydrabad – 500 082, Andhara Pradesh India Emial : dineh@ Irapindia, org

Addresses of other WALMI's

- 1) Director General
Water and Land Management Training
Research Institute (WALMTARI)
Rajendranagar, Himayatsagar,
HYDRABAD-(A.P.) 500 030
Phone : 040-24015282 (O),
040-23817732 ®
FAX : 040-24016661
E-Mail : dg-walmtari-iwm@rediffmail.com

- 2) The Chief Engineer & Director
Water & Land Management Institute,
Irrigation Dept, Government of Bihar,
Hardinge Road, Barrack No 5,
West Irrigation Secretariat
PATNA – 800 001, BIHAR
Phone : 0612 –452204 (O)
FAX : 0612-452232

- 3) The Chief Engineer & Director
Water & Land Management Institute,
P.B. No 80, Vadod Road, Anand,
GUJRAT—388 110
Phone: 02692- 61851,62450
FAX :02692-41651

- 4) Director
Water & Land Management Institute
WALMI Hills, Kaliasote Dam, kolar Road
P.B.No.535, Ravishankarnagar BHOPAL-462 016,M.P.
Phone:- 0755-2492673-(O)
FAX : 0755-2492432
E-Mail-walmi@rediffmail.com
mpwalmi@sancharnet.in

- 5) Director
Water & Land Management Institute
WALMI, At Pratapnagari, P.O.Telengapentha,
Cuttack-, ORISSA, India, 753051
Phone-(0671)2686426,2686431,2686432 (O)
FAX: (0671)2686430

- 6) Director
Irrigation Management & Training
Institute, Dadabari Road, Near CAD circle,
Kota Junction
Kota-324004- RAJASTHAN
Phone: 0744—500642,500682 (O)
FAX: 0744- 427029,421930

- 7) Director
Irrigation Management & Training Institute
P.O.Box 16, V.V.Kottai Thuvakudy, Tiruchirappalli, 620015, TAMILNADU.
Phone: 91431500088 (O)
FAX: 91431500603
Email: dirimti@tamilnaduimti.org

- 8) Director
Water & Land Management Institute
WALMI Bhawan, Utratia,
LUCKNOW-226 025, U.P.
Phone: 0522-440309/440553
FAX : 0522-440309
E-Mail: Walmeup@sancharnet.in

- 9) Director
Water & Land management Institute
Belur, Industrial area, P.B.No.6, PB Road post Mummigatti, Dharwad-580001
KARNATAKA
Phone-0836-2486893,
Fax-0836-2486889
Email: walmidharwad@sify.com

- 10) Director
North Eastern Regional Institute of
Water & Land management (NERIWALM)
Government of India, P.O. Kaliabhomora,
Dolabari, TEZPUR-784027 ASSAM
Phone: 03712-220686/231007/232007
FAX: 03712-221977
E-mail: neriwalm@sify.com