Rainfall and Supplementary Irrigation
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Whatever we have seen the previous lectures it is about the cloud pattern which you will be able to observe it from the satellite pictures followed by what you are able to observe it from your own place what type of cloud it is then what is the probability of a rainfall from those clouds and how do you; that is one thing which you can do is there are forecast which comes onto you either in the mobile or in any other form and you yourself can experience by saying the satellite image observing the clouds and what type of forecast it is then you would be able to evaluate what is the accuracy with which you can use it in for your irrigation scheduling that is what we were trying to show you the information which is possible in this part of the world.

Now why it is useful is? This rainfall if it is high then you are not going to gives supplementary irrigation; supplementary irrigation is nothing but our extra water which is not from the rain with the cloud then we are going to give it from the ground water so what is the rainfall and how much is the supplementary irrigation which needs to be given that is the way which we will talk about in the forthcoming slides. Now when you look at it what is a saturation; once the rainfall falls what happen is the top layer is saturated that means 100 percentage water is available and at the same time what is happening is the rain water starts moving down and this is the place the root zone is available. The root zone is the place where the plant gets from the roots only the plants get the water and it makes the food. So if the saturation is more then it is good if the saturation is dry or it is not sufficient soil moisture is available in that zone that means the plant will get very less water so that it will not be able to make a food out of that so there is a probability that wilting building is nothing but due to the shortage of moisture or a water content the plants may get withered. Withered means the growth will be hampered.

So, now that is what we are interested when it rains then water should be available till the root zones are there then only the crop is going to survive otherwise the crop will has to find some reduced amount of water for its activity. So, this is the thing which is available what is the plant available water which you need to do that and what are application how you can do that these are all certain how much water to irrigate how much water is needed at an individual time. This is the relationship which normally available with every farmer over there.

Now the next question is how do you make the monthly rainfall; monthly rainfall if there are the crops are grown for four months; the first month is the seedling second month is a plant growth third month is the vegetation growth fifth phase is going to be a maturity and other like that so in that case this shows that this pace of a particular section when the middle month middle month is always during the monsoon season; they get the maximum rainfall whereas the rest of the months like what you see here is going to be less. So, initial stages it will be less during the growth period plant period it is more and afterwards it gets reduced.

So, this can be converted into a weekly rainfall requirements. Now, what you see here is the weekly rainfall of a particular rain gauge station; rain gauge station assuming that the crop seeding is done in the first week of June and it ends somewhere in the October is the end of the week. So now what is done here is the total rainfall amount during the particular week is given in this format.

Now this 2.4 or 00 means there is no rain; 00 means no rain. Suppose if the plant needs water every week, every seventh day or eighth day, every week it needs that means in this week there is no supply from the rain there is a need for the water from the supplemental irrigation.

Okay. Similarly when it is more than 20 rainfall pattern what is done here is minimum is 25 millimetres of rainfall is needed over a weekend assuming there is evaporation there will be a losses. So, that this plant they are able to grow in a normal way but now when you look at this particular place the irrigation or a supplementary irrigation is needed except for three weeks other days you have to have a water supply with you and this is to show that in this place if you are planning for a particular crop, you need to have your own supplementary water source like ground water to the extent otherwise there is not much of support of rain for you to grow things whereas when you look at it there are certain place months or certain weeks where this rainfall is more than 100 millimeters during that 100 millimetres of rainfall what is possible is there could be some amount of runoff is possible the soil moisturization will be more.

It will be able to take care of certain water demands on the adjacent weeks but it needs to be site-based; it is not going to the same universal for everywhere; the irrigation schedule; irrigation schedule in this case in the rain for agriculture what is irrigation schedule means when there is no rain; no rain that means you have to go for the irrigation that is what it is soif the previous week what we have seen irrigation need to be planned for this entire June to July as well as part of August as well as at the end of October. So, you have to be prepared and the quantum of water which is needed for the crop that should be assured then only the crop yield will be better in this areas.

Now that is why it is based on whether based; whether based is; another one is temperature at that area that the evaporate and transpiration also takes certain amount of waste that is why if the weather if it is a temperature is more then the losses will be more. Second thing is about the soil moisture based irrigation the soil moisture based irrigation is nothing but how much is the water which is available in the root-zone based on that that the balance need to be irrigated.

Now another thing; third one is it is based on the plant base so if there is going to be a water stress and suffering from the water shed need to be understood and accordingly we need to give irrigation schedule.

What is the water; the irrigation schedule is based on water and weather conditions for that purpose what is needed is the rain gauge, temperature then we need the data logger and all those things can be kept in a particular area and that can be monitored and the water

requirement and irrigation schedule can be arranged. So, how do you measure is it is about the rain sensors which will tell you about how much the rainfall it has fallen then it is the soil moisture which you have to that the probe should be there well; within the root zone then the wind sensor that will tell you about because of how much is the wind speed and because of the high wind speed how much will be the water loss is possible then irrigation sub meters are there to quantify the water used for different purposes then drip irrigation is a system; valves, tubes and emitters that will tell you about how much water it will likely to give over there.

So, that water is not lost during the irrigation schedule. Now when you look at it; it could be a field wherein you are able to have a precise type of agriculture activities; you can be there you need to have rows and things like that and you can have all your sensors and the based on that is the schedule of water or deep irrigation can controlled or it could be based on the total thematic information base that can be arranged in this way and you can prepare what is the water requirements and water scheduling which you will be able to ascertain in this way.

Now it can be if you have a total area then there will be a different type of land uses that is whether it is a plant water use type whether it is more or whether it is less depending upon the plant conditions that can also be done. So, now what we have seen in this lecture is how irrigation, the rainfall over a period of period of; there is, if it is going to be irrigation schedule is every 7 days or every 10 days or every 15 days; how much the rainfall which it is received during the period; what is the water requirement what is the balance what is the deficit of rainfall that rainfall can be substituted by the supplemental irrigation. So, for this is how this particular lecture is designed. Thank you.