

Slide 1: Welcome to this class, at this week, in the last 2 to 3 lessons, we were discussing on scientific weather forecasting, that is now casting, short range forecast, medium range, long range, seasonal climate forecasts, and these weather forecasts, how they use different scientific tools to develop weather forecasts. And also I have discussed something on indigenous traditional knowledge ITK. When you combine these two, scientific forecast and the ITK your accuracy of the forecast, is increased.

Slide 2: Now I like to request you to attach more importance on today's discussion also, that is weather thumb rules and their validity. So thumb rules also very-very important. These thumb rules also can be added one among the tools for improving your scientific weather forecast similar to you ITK, indigenous traditionalist knowledge that we will be doing for today's discussion. So here the cause and the effect are combined scientifically, thumb rules, very scientifically, quantifying here to the actual for the benefit of mass and easy adoption, very easy to adapt thumpers. So when you merge these three, these means scientific weather forecast, iTK, and thumb rules, your agro advisory validity is still improved to the greater level and farmers may have or may develop confidence on your agro advisories. So this is a good opportunity to land more on the thumb rules to be used.

Slide 3: One is rainfall. What is the thumb rule. Here if you get 5 to 10 millimeter of rainfall, enough soil moisture support your crop, 5 to 10 mm, 5 to 10 mm, means, through rain gauge you make sure the rainfall and take these. Then when this is the case, you go for plant production. For plant production some amount of soil moisture is required. When you apply any chemicals on the plant surface, the plant surface develop some hotness or temperature, leaf temperature gets increased, similar to what we have studied with the referrals to higher R-gauge. So we have to cool the plant, for cooling the plant, there must be some rainfall, go for single irrigation, 5 to 10 mm. Then if the rainfall of your particular area time is 10 to 12 mm, you go for hand weeding and hoeing. So these are all thumb rules. Rule is here, here something is there, based on that thumb rule is developed. When the rainfall is 12 to 15 mm, you go for fertilizer application. If the fertilizer is applied without any soil moisture means, it is a waste, it does not go into the soil profile. It is not being taken by your plan. So some moment of moisture is required. So 12 to 15 mm, go for fertilizer application. In the case of the irrigated agriculture, moisture is not a limiting factor. Because after application of fertilizer, you can provide irrigation, but for dry land agriculture, with the receipt of rainfall, you have to decide your form of operation, for that this knowledge would be highly useful to you. The rainfall is 25 to 30 mm. Sowing under dry land can be done or even under irrigated condition you can start sowing by saving your ground water, so integrated management, containing ground water as well as rainfall. Then greater than 30 mm, there would be soil loss through soil erosion, so take appropriate action against soil erosion and water conservation technologies. So these

are all thumb rules. Here on this side, science is there, this side what is the decision to be taken, based on our past experiences. You are campaigning the both together.

Slide 4: Then temperature, if the day temperature is greater than 32 degrees centigrade and continued for a week, this environment make sucking pest to come in larger numbers and feed the... our crops. So incision of sucking pest infestation and planning for plant protection. Plan yourself, when the temperature is more than 32 degree centigrade and continued for a week. When the night temperature, that is minimum temperature lesser than 20 degree, and continued for a week, germination of disease spore and hence planning for plant protection. When the night temperature falls below 20 degrees centigrade means, the leaf moisture would be more, the spores that have fallen already on the leaf, tries to germinate with the moisture available from the leaf. So disease incidence would be initiating. When the day temperature is more than 34 degree centigrade and continues, provide irrigation immediately to protect the crop from early maturity or stresses. One example, I like to say for this. In one part of Tamil Nadu, there was a sudden fall on tomato price. It was selling in last week about 50 rupees per kg, but suddenly the price has fallen to 1 rupees per kg, what happened. There is good amount of arrival in the market, then we examine with the farmer. We were able to understand that there was high temperature more than 34 degree centigrade in the last two weeks, so the maturity, the fruits had turned full maturity and arrived to the market. Then we reviewed the literature, it was saying that, when the temperature is more than 34 degree centigrade, immediately you provide, irrigation then your maturity will be stopped. So in the next decision with the same event of 34 degree centigrade, we practice the irrigation to the tomato crop and we could see very interestingly that the science was proved that about 34 degree with the irrigation the crop is so good as and it came to maturity at regular intervals, rather than suddenly. So like that these are all some thumb rules greatly to be integrated for our, developing our agro advisories.

Slide 5: Now wind speed, see the wind speed is lesser than 5 km, very calm, classically we say it is very calm. plant protection, hand weeding, and hawing can be done. Plant production means no drifting, hand weeding and hawing means no spread of your soils over the people working in the field. Then 10 to 15 km, winnowing of the produce, without any energy mechanical energy, electrical energy, through natural energy you can clean your produce. Then 15 to 20 plus rainfall of greater than 25 mm, cropping of sugar cane is necessary, otherwise, it may get fall. Wind speed greater than 20, cropping of sugar cane more than 8 months and banana. Then wind speed of greater than 20 plus minimum temperature lesser than 20 degree centigrade, plus evening RH of greater than 60%, epidemic spread of disease. So we have to take plant protection and everything. So this is the

way, we have to use these developed information for developing our agro advisories as well as improving the preciseness of our weather forecast.

Slide 6: Now come to the relative humidity, when the evening relative humidity is more than 60 and continue for a week, disease initiation will start like minimum temperature and even RH more than 60 with a minimum temperature of 20 degree, wind is of 15, then epidemic spread of the disease. So epidemic is very-very-very important. So these are the weather elements that help to carry the disease further away and spread very intensively.

Slide 7: Then some things, pest and disease forecast for long range. This is published and available in many books. So mean year temperature, if it is greater than 32 degree centigrade, during December January and February, corn flies beetle infestation would be more. That means, in May's crop beetle will come. So here tobacco will be heavily effected with blue fungi in America and some other countries. So similarly it is given for India, yellow wheat, purple rust, and block wheat rust, so all those will come, when these things are observed in a particular environment. So these are all some thumb rules that can be used effectively one to improve your weather forecast accuracy, two to improve your agro advisory preparations. So in addition to scientific weather forecast, you how to utilize the thumb rules and also indigenous traditional knowledge, then you will be always successful in reducing the crop production risk. Next we will be seeing in this class. Thank you very much.